



Sociodemographic determinants of youth sports club participation across two generations: the Young Finns Study

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Abstract

Aim Sports club participation (SCP) provides opportunities for physical activity, but not all youth have equal opportunities for it. This study examined the prevalence and disparities in SCP among Finnish youth across two generations (1980–1986 and 2018–2020), focusing on sociodemographic factors.

Subject and methods The study examined the 9–18-year-olds ($n = 3439$) of the original Young Finns Study population in the 1980s (1980, 1983, and 1986) and their 8–19-year-old offspring ($n = 1156$) in the 2020s (2018–2020). Self-reported SCP and its correlates (sex, family income, parental educational attainment, urbanity of residential area, and geographical region) across the two generations were studied within four age groups (8–10-/11–13-/14–16-/17–19-year-olds).

Results Youth SCP was more prevalent in the 2020s than in the 1980s ($p < 0.001$). In the 1980s, boys had higher SCP rates than girls ($p < 0.001$), while this sex difference was no longer observed in the 2020s. Family income was directly associated with SCP in 15–18-year-olds in the 1980s and 8–16-year-olds in the 2020s ($p < 0.05$). SCP several times a week was less common in rural than in urban areas in both generations ($p < 0.05$).

Conclusion By the end of the study period, SCP prevalence had risen and sex differences in SCP had narrowed. However, youth from less affluent families or rural areas still showed lower SCP than those from affluent families or urban areas. Efforts are needed to address these disparities.

Keywords Organized sport · Physical activity · Childhood · Adolescence · Residential area · Socioeconomic status

Introduction

Regular physical activity (PA) is essential for children's and adolescents' physical and mental health (Biddle et al. 2019; Granger et al. 2017; Hallal et al. 2006; Piercy et al. 2018;

Rodriguez-Ayllon et al. 2019; Valkenborghs et al. 2019; Warburton & Bredin 2017), whereas long-term sedentary behavior is associated with detrimental health outcomes (Carson et al. 2016). While the advantages of PA are widely acknowledged, a recently conducted systematic review

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concluded that the overall PA level declined in high-income countries between the years 1995 and 2017 in all age groups and particularly among adolescents (Conger et al. 2022). Because PA behavior is not yet as stabilized for children and adolescents as it is for adults (Lounassalo et al. 2019), childhood and adolescence are potential phases of life for adopting a physically active lifestyle.

Participation in organized youth sports has been shown to be a predictor of PA in later life (Palomäki et al. 2018; Batista et al. 2019; Lagestad 2019; Suominen et al. 2024). In high-income countries, with many attractive sedentary pursuits for youth, sports clubs play an important role in engaging children and adolescents in PA and socializing them into sports. Participation in organized sports may further improve physical and mental health (Griffiths et al. 2010; Merkel 2013; Lagestad 2019; Oja et al. 2024) and promote other healthy lifestyle choices (Palomäki et al. 2018). Alongside the health benefits, other advantages have been identified with organized youth sports, such as enhanced social skills, improved academic achievement (Merkel 2013), higher school well-being, skipping school less frequently, and engaging less in juvenile delinquent activity (Bakken 2017). However, disadvantages have also been noted, including risks of injury and pressure to succeed (Merkel 2013).

Approximately half of children and adolescents participate in organized sports in high-income countries (Tremblay et al. 2016). The overall participation in organized youth sports in Finland has increased in recent decades, with the increase being slightly higher among girls than boys (Laakso et al. 2008; Mathisen et al. 2019). In Finland, nowadays 60% of 9–15-year-olds participate regularly in organized youth sports (Blomqvist et al. 2023; Mononen et al. 2025). However, the difference in participation rates between age groups is notable: while 70% of 11-year-old Finns participate in sports club activities, the equivalent number for 15-year-olds is a bit over 40% (Blomqvist et al. 2023; Mononen et al. 2025). Participation in organized youth sports begins at a younger age than in earlier decades (Koski 2009; Blomqvist et al. 2019; Nordbakke 2019). In Finland, for example, the mean onset age in SCP was 10 years in the 1960s, 8 years in the 1980s, and 7 years in the twenty-first century (Koski 2009). In Finland, dropout from organized sports typically occurs before turning 15 years of age (Vuori et al. 2004), which is slightly earlier than the European average, with boys dropping out around 14–18 years and girls around 14–16 years of age (Emmonds et al. 2024).

While organized youth sports participation rates have increased, not all children and adolescents have equal opportunities to participate in organized sports (Puronaho 2014; Koski et al. 2015; Koski and Mäenpää 2018). The current trends reported in the youth sports field include rising costs, professionalization, differentiation, and diversification worldwide (Gould 2019) and in Finland (Koski

and Mäenpää 2018), which all may increase inequality in youth sports participation. In particular, socioeconomic status (SES), including family income and parental education, has been reported to be positively associated with organized youth sports participation in Finland (Telama et al. 2009) and several high-income countries (Bengoechea et al. 2010; Nielsen et al. 2012; Vandermeersch et al. 2016; Hobza et al. 2022; Post et al. 2023). In addition to SES, disparities in participation in organized youth sports in high-income countries have been observed based on the provision and availability of sporting facilities (Eime et al. 2015, 2017), gender (Lehtonen et al. 2022), and age (Studer et al. 2011).

Finnish youth living in cities are more likely to participate in organized youth sports than those in rural areas (Palomäki and Heikinaro-Johansson 2011). Urbanization since the 1960s in Finland has widened disparities in the sports field between residential areas: sports clubs face increasing pressure in growing urban centers, while resources diminish in rural areas losing population due to migration to bigger cities (Koski and Mäenpää 2018). In 1986, only 26% of sports clubs were in larger municipalities with over 50,000 residents, while by 2016, the proportion had risen to 47% (Koski and Mäenpää 2018). Migration trends in Finland have also seen people moving from Northern and Eastern counties to the South and Southwest, with urbanization mainly centered in the Helsinki area (Heikkilä 2003). According to previous findings, boys from Eastern and Southern Finland and girls from Southern and Western Finland were the most active in organized sports, with the lowest participation rates in Northern Finland (Palomäki and Heikinaro-Johansson 2011).

Studying changes in organized youth sports and associated factors over time is essential for understanding and addressing potentially evolving disparities in the youth sports sector. The current study compared the prevalence of sports club participation (SCP) among Finnish 8–19-year-old children and adolescents across two generations (1980–1986 and 2018–2020), examining associations of SCP with sex, age, family income, parental educational attainment, urbanity of residential area, and geographical region (Eastern-Northern vs. Western-Southern Finland). To our knowledge, this is the first Finnish study to examine sociodemographic and geographical disparities in youth SCP across two related generations, comparing the 1980s and 2020s.

Methodology

Study design and participants

The data were from the Young Finns Study (YFS) which is an ongoing longitudinal population-based study. The YFS

was originally designed to study cardiovascular disease risk factors. Study participants were randomly selected from five Finnish cities (Helsinki, Kuopio, Oulu, Tampere, and Turku) and their surrounding communities. A more detailed description of the YFS protocol has been reported previously (Raitakari et al. 2008).

The original YFS population, generation 1 (G1), included randomly selected boys and girls from six age cohorts (ages 3, 6, 9, 12, 15, and 18) with a baseline in 1980 (G1, $n=3596$; 83.2% of invitees). G1 participants were followed up at intervals of 3–9 years, with the latest follow-up in 2018–2020 (G1, $n=2064$; 55% girls). In the data collection of 2018–2020, the offspring of G1, referred to as generation 2 (G2), also participated in the study (G2, $n=2539$; 55% girls).

This study analyzed questionnaire data from the 9-, 12-, 15-, and 18-year-old participants collected in 1980, 1983, and 1986 (G1, $n=3439$; 51% girls) and data from their 8- to 19-year-old offspring collected in 2018–2020 (G2, $n=1156$; 53% girls). Data from G1 participants have been combined for analysis, with collections from 1980, 1983, and 1986 referred to as the “1980s data” and the 2018–2020 collection as the “2020s data.”

Measures

Sports club participation (SCP) Both generations self-reported their SCP in youth. The question concerning youth SCP was: “How many times a week do you usually engage in training sessions organized by a sports club?” Options were “not at all,” “occasionally,” “less than once a month,” “more than once a month,” “once a week,” and “several hours and times a week.” In this study, the four options in the middle were combined, and this category was defined as “SCP at most once a week.” A three-class SCP variable was then created: (1) no SCP (reference group), (2) SCP at most once a week, and (3) SCP several times a week.

Family’s socioeconomic status (SES) Self-reported annual family income and parental educational attainment level were used as indicators for SES. Participants were grouped in tertiles according to the annual pre-tax income level of the family: (1) low (reference group), (2) middle, and (3) high family income tertiles. The currency in Finland was the Finnish mark until 2002, after which it has been the euro. The average annual inflation in Finland from 1980 to 2018 was 2.93%, with a cumulative change in the cost-of-living index of +199.31% (Statistics Finland 2023). Thus, the annual family income tertiles were divided according to the value of the monetary unit at each measurement year and to the response categories of the annual family income in the questionnaire. This led to slightly uneven tertiles (Table 1). For example, the categories for the annual family

tertiles in 1980 for G1 were 0–35,000 FIM (€0–18,000), 35,001–55,000 FIM (€18,000–28,000), and > 55,001 FIM (> €28,000), and for G2, €0–55,000, €55,001–90,000, and > €90,000.

For G1, the parent with a higher level of education was used as the indicator for parental educational attainment. For G2, the corresponding quantities were based on the data for the original YFS participant—either mother or father. Parents’ educational attainment was divided into three categories in G1: (1) primary, (2) secondary (reference group), and (3) higher education. For G2, categories 1 and 2 were combined for further analysis, as very few parents had primary education only in the 2020s.

Family’s residential area The urbanity of residential area and the geographical region were used as indicators for the family’s residential area. For G1, the urbanity of the residential area was queried, and for G2, it was identified based on the reported postal code area of the participant (Helminen et al. 2020). The residential area was divided into four categories: (1) urban (i.e. city center), (2) suburban (reference group), (3) countryside, and (4) sparsely populated area. The geographical region in Finland was defined by sampling protocol for G1 and identified from the postal codes for G2. The geographical region was dichotomized into (1) Eastern and Northern Finland (reference group) and (2) Western and Southern Finland. The decision to dichotomize the geographical region was based on previous findings concerning the regional socioeconomic disparities between the wealthier Western-Southern Finland and less prosperous Eastern-Northern Finland (Fina et al. 2021).

Statistical analyses

Descriptive characteristics were reported as percentages. A chi-squared test of independence was used when reporting differences between sexes for the descriptive variables. R software version 4.2.1 (R Development Core Team 2022) was used for statistical analyses and figures.

The prevalence of self-reported SCP for G1 at the ages of 9, 12, 15, and 18 years in 1980–1986 was compared to the prevalence of SCP for the G2 in 2018–2020 at similar ages of 8–10/11–13/14–16/17–19 years using the chi-squared test of independence. The correlates studied for SCP were sex, family income, parental educational attainment, urbanity of residential area, and geographical region. Associations between these correlates and the prevalence of SCP were studied using multinomial logistic regression analysis.

The analyses were stratified by the two generations and four age groups, leading to eight models in total. For each model, those participants reporting no SCP in childhood or adolescence were considered as a reference group. Two other SCP groups (participating at most once a week and

Table 1 Descriptive data (%) for generation 1 (1980, 1983, and 1986) and generation 2 (2018–2020)

	Generation 1 (1980–1986)					Generation 2 (2018–2020)					Differences between generations: p-values of chi-squared test for independence*				
	9-year-olds (N=1806)	12-year-olds (N=1880)	15-year-olds (N=1899)	18-year-olds (N=1790)	8–10-year-olds (N=233)	11–13-year-olds (N=334)	14–16-year-olds (N=321)	17–19-year-olds (N=272)	8–10-year-olds	11–13-year-olds	14–16-year-olds	17–19-year-olds			
Sex (%)															
Girls	50	51	51	52	55	46	52	61	0.252	0.085	0.769	0.005			
Boys	50	49	49	48	45	54	48	39							
Annual family income (%)															
Low tertile	24	27	27	30	23	19	21	23	0.211	0.005	0.021	0.002			
Middle tertile	36	34	32	26	42	41	39	38							
High tertile	40	39	41	44	35	40	40	39							
Parental educational attainment (%)															
Primary education	46	56	62	68	5	3	4	8	<0.001	<0.001	<0.001	<0.001			
Secondary education	41	33	29	24	34	39	47	48							
Higher education	13	11	9	8	61	58	49	44							
Urbanity of residential area (%)															
Urban	10	9	10	12	25	28	25	28	<0.001	<0.001	<0.001	<0.001			
Suburban	36	38	37	40	41	44	38	39							
Country-side	30	28	28	23	12	12	19	15							
Sparsely populated area	24	25	25	25	22	16	18	18							
Geographical region (%)															
Eastern-Northern Finland	48	48	48	48	31	28	31	33	<0.001	<0.001	<0.001	<0.001			
Western-Southern Finland	52	52	52	52	69	72	69	67							

*Statistically significant values are shown in bold

participating several times a week) were compared to the reference group. Odds ratios (OR), their 95% confidence intervals (CI), and *p*-values were calculated for the associations for each factor level and both SCP groups. Alpha=0.05 was considered a statistically significant value. Model performance was evaluated by calculating approximative coefficients of determination (pseudo-*R*-squared) values as originally proposed by Cragg and Uhler (1970). Missing data were treated using a case-wise deletion approach which discards the data for any records with missing values. The participants who had SCP data from at least one measurement point and data for all the correlates were included in the multinomial logistic regression analysis.

Ethics

The study followed the principles of good scientific practice laid down by the Helsinki Declaration. The study protocol was approved by the local ethics committees of the universities involved in the YFS. Written informed consent was obtained from all participants (Raitakari et al. 2008). Participation in the study was voluntary, with participants having the right to withdraw at any point. All data were treated confidentially, and personal data were pseudonymized. To enhance reporting quality, this study was conducted according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement (Supplement 1).

Results

Sample characteristics

Descriptive statistics of G1 and G2 are reported in Table 1. A larger percentage of families were in the low family income tertile in the 1980s than in the 2020s ($p < 0.05$). Parents were less educated in the 1980s than in the 2020s ($p < 0.001$). About 10% of the families lived in city centers in the 1980s, whereas in the 2020s, about one fourth of the studied population lived in cities ($p < 0.001$). At the baseline in 1980, about half of G1 lived in Western-Southern Finland, while the proportion was over two thirds for G2 by the 2020s ($p < 0.001$) (Table 1).

Prevalence of youth SCP across two generations in Finland

The descriptive data regarding the prevalence of youth SCP from the whole study population and separately for boys and girls can be seen in Fig. 1 for G1 and Fig. 2 for G2. In all age groups, and especially in the two youngest age groups, SCP was more prevalent in the 2020s than in the 1980s ($p < 0.001$). For example, two thirds of the children in the youngest age group did not participate in sports club activities in the 1980s, while the corresponding proportion was only one third in the year 2020. Additionally, the prevalence of SCP several times a week was 8%

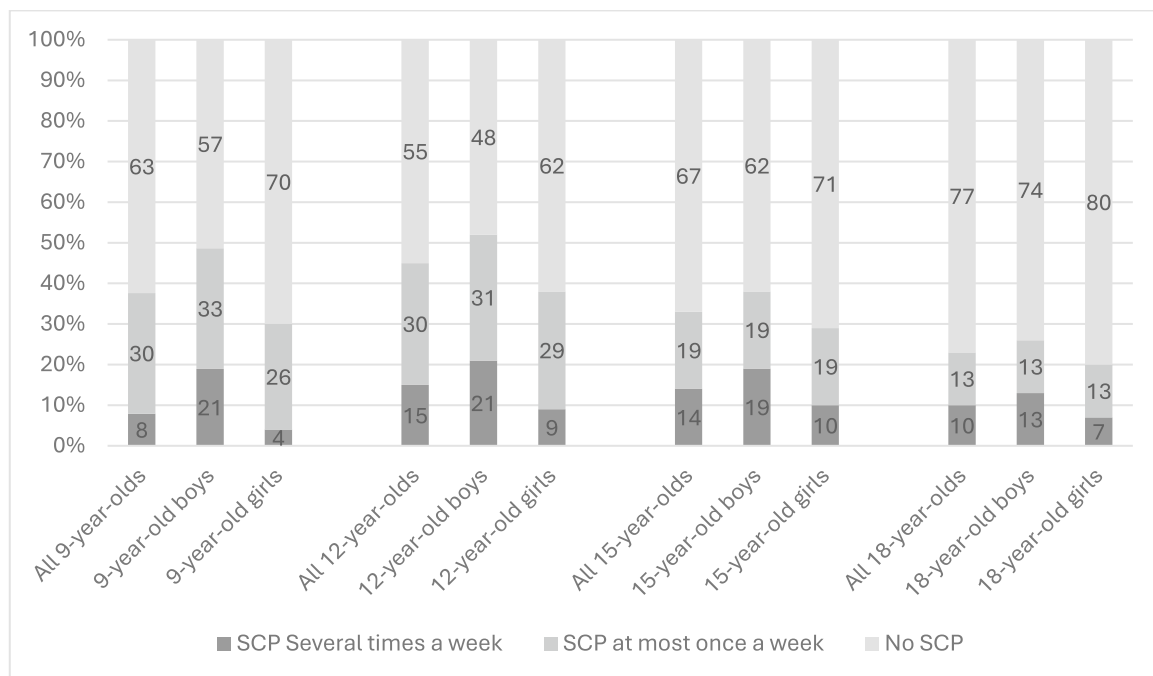


Fig. 1 Prevalence of sports club participation (SCP) among Finnish boys and girls in 1980–1986 (generation 1) by age groups (%)

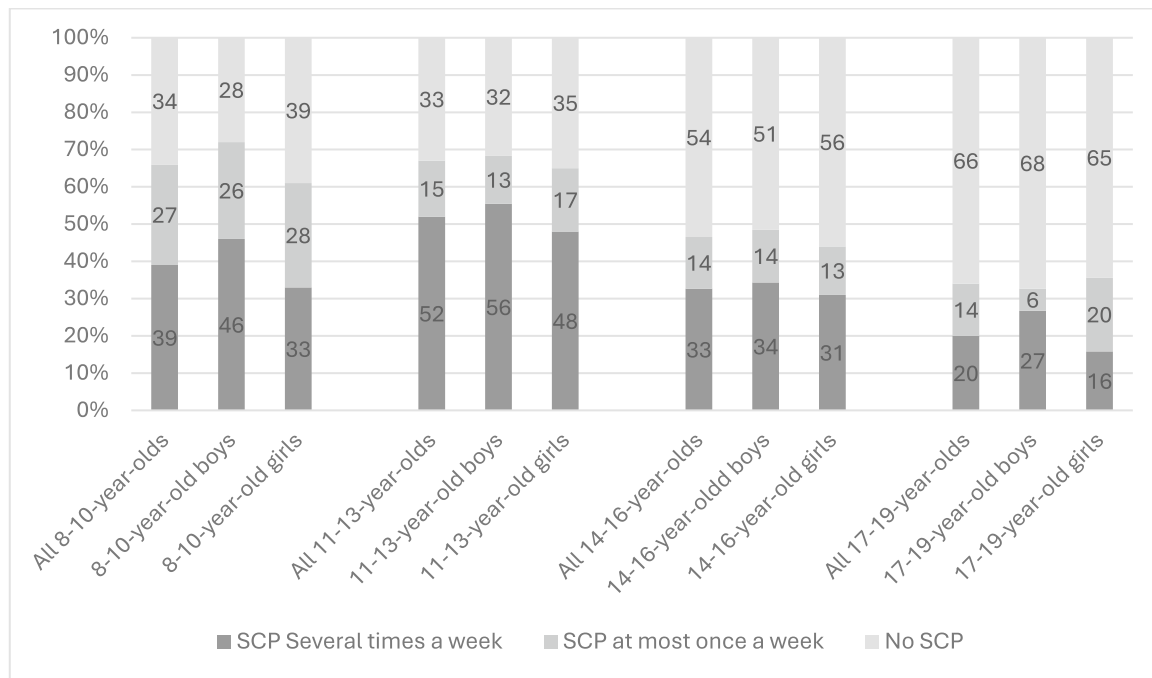


Fig. 2 Prevalence of sports club participation (SCP) among Finnish boys and girls in 2018–2020 (generation 2) by age groups (%)

for children in the youngest age group in the 1980s, while the number had risen to 39% in the 2020s. In every age group, SCP several times a week had more than doubled from the 1980s to the 2020s.

While the overall youth SCP has increased since the 1980s in Finland, a general decreasing trend in SCP with age is still observed in the 2020s as it was in the 1980s (Figs. 1 and 2). In the 1980s, the 12-year-olds had the highest SCP rate (45%, including those participating at most once a week and several times a week), while the lowest was among the 18-year-olds (23%) (Fig. 1, All). In the 2020s, the highest SCP rate was observed among the 8–10- and 11–13-year-olds (67%) and the lowest among the 17–19-year-olds (34%) (Fig. 2, All).

The following results are based on the multinomial logistic regression analysis (Fig. 3), where the pseudo-R-squared values were 0.10–0.12 for age classes of G1 and 0.09–0.29 for age classes of G2. SCP several times a week was more common among boys than girls in all the studied age groups in the 1980s ($OR = 2.23–3.16$, $p < 0.001$) (Fig. 3), with the SCP being at least twice as common for boys as for girls (Figs. 1 and 2). Also, SCP at most once a week was more common among 9-year-old boys ($OR = 1.59$, $p < 0.001$) and 12-year-old boys ($OR = 1.38$, $p < 0.05$) than girls in the 1980s. This sex difference was no longer observed in the 2020s. In fact, it was observed that SCP at most once a week was less probable for 17–19-year-old boys than it was for girls in the 2020s ($OR = 0.34$, $p < 0.05$) (Fig. 3).

Family SES and offspring's SCP

In the 1980s, 18-year-olds in the middle and high family income groups were significantly more likely to engage in SCP several times a week ($OR = 2.84$ and 3.43 , $p < 0.01$, respectively) and at most once a week ($OR = 2.07$, $p < 0.05$ and 2.45 , $p < 0.01$, respectively) when compared to their peers in low family income groups (Fig. 3). Similarly, 15-year-olds from these middle- and high-income groups also showed higher odds for SCP several times a week ($OR = 1.84$, $p < 0.05$ and $OR = 2.28$, $p < 0.01$, respectively) and SCP at least once a week ($OR = 1.61$, $p < 0.05$ for high-income family) when compared to the low-income group. In the 1980s, this association was not observed among the younger age groups studied, the 9- and 12-year-olds (Fig. 3).

In the 2020s, the 8–10-year-olds in the high family income group had higher odds for SCP at most once a week ($OR = 5.02$, $p < 0.01$) and several times a week ($OR = 6.52$, $p < 0.01$) when compared to those in the low family income group (Fig. 3). Among the 11–13-year-olds, the tendency was similar: those in the middle ($OR = 2.08$, $p < 0.05$) and high ($OR = 3.24$, $p < 0.01$) family income groups were more likely to participate in sports several times a week than those in the low family income group. Also, the 14–16-year-olds in the middle family income group had higher odds for SCP several times a week ($OR = 2.55$, $p < 0.05$) than those in the low family income group.

In the 1980s, among the 18-year-olds only, one statistically significant difference was found when studying

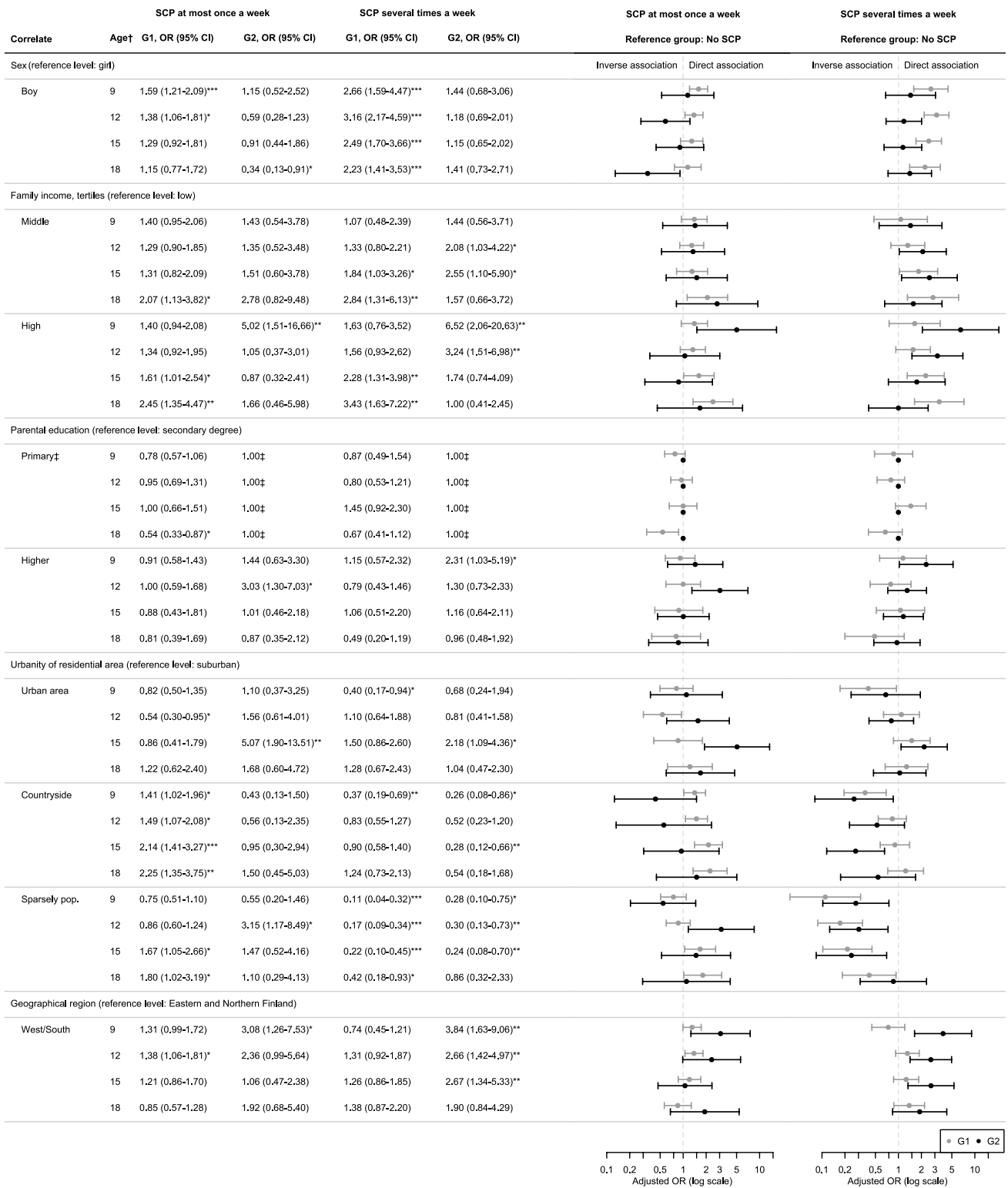


Fig. 3 Associations of SCP and its correlates within two generations (G1 and G2) from the multinomial logistic regression models. Odds ratios (OR) and 95% confidence intervals (CI) for occurrence of two levels of SCP compared to reference group (no SCP) and sex, family income, parental education, urbanity of residential area, and geographical region. Statistically significant associations are marked

by * $p < 0.05$, ** $p < 0.01$, or *** $p < 0.001$. †The ages of G1 cohorts are shown in the rows of the table panel. For G2, the corresponding age classes are 8–10, 11–13, 14–16, and 17–19 years. ‡For G2, the primary and secondary levels of parental educational attainment are combined

associations between the parent's education and their child's SCP. When the participant's parent had primary education only, the participant had lower odds of SCP at most once a week when compared to participants with a parent having secondary education ($OR = 0.54, p < 0.05$). In the 2020s, the 8–10-year-olds with a parent having a higher education degree had higher odds for SCP several times a week ($OR = 2.31, p < 0.05$), just like the 11–13-year-olds for SCP at most once a week ($OR = 3.03, p < 0.05$), when compared to participants with parents with a lower level of education (Fig. 3).

Family's residential area and offspring's SCP

In both studied generations, youth who participated in sports club activities several times a week were more likely to live in urban than in rural areas (Fig. 3). For example, in the 1980s, in all age groups, participants living in sparsely populated areas had lower odds of SCP several times a week than those living in suburban areas ($OR = 0.11–0.42, p < 0.001$, except for the 18-year-olds, $p < 0.05$). In the 2020s, the association was similar for the 8–10-year-olds ($OR = 0.28, p < 0.05$), the 11–13-year-olds ($OR = 0.30, p < 0.01$), and the 14–16-year-olds ($OR = 0.24, p < 0.01$). Also, the 9-year-olds ($OR = 0.37, p < 0.01$) in the 1980s and the 8–10-year-olds ($OR = 0.26, p < 0.05$) and 14–16-year-olds ($OR = 0.28, p < 0.01$) in the 2020s living in the countryside had lower odds of SCP several times a week than those living in suburban areas. However, in the 1980s, SCP at most once a week was more prevalent in the countryside in all the age groups ($OR = 1.41–2.25, p < 0.001/0.01/0.05$) and in sparsely populated areas among the 15- ($OR = 1.67, p < 0.005$) and 18-year-olds ($OR = 1.80, p < 0.05$) than in suburban areas (Fig. 3).

In the 1980s, the geographical region of the family (living in Eastern-Northern vs. Western-Southern Finland) was not associated with the participant's SCP except in one age group: the 12-year-olds living in Western-Southern Finland had higher odds for SCP at most once a week than those living in Eastern-Northern Finland ($OR = 1.38, p < 0.05$). By the 2020s, the situation had changed: children and adolescents in the groups of 8–10, 11–13, and 14–16 years of age ($OR = 2.66–3.84, p < 0.01$) and living in Western-Southern Finland had higher odds of SCP several times a week than their peers living in Eastern-Northern Finland (Fig. 3). Additionally, 8–10-year-olds in Western-Southern Finland had higher odds of SCP at most once a week ($OR = 3.08, p < 0.05$) than those in Eastern-Northern Finland in the 2020s.

Discussion

This study provided valuable insights into youth SCP among Finnish children and adolescents across two generations in the 1980s and the 2020s. It examined how sociodemographic and geographical factors, such as sex, family income, parental education, urbanity of residential area, and geographical region, were associated with youth SCP. The findings showed that SCP was more prevalent among Finnish children and adolescents in the 2020s than in the 1980s. In the 1980s, participation in sports club activities several times a week was less common in girls than in boys. However, by the 2020s, this difference was no longer observed, indicating more sex-equitable access in sports clubs. Parental education and, particularly, family income were positively associated with youth SCP, with these associations appearing at younger ages in the 2020s than in the 1980s. Children and adolescents living in rural areas or Eastern-Northern Finland had less frequent SCP than those in urban areas or Western-Southern regions.

Age- and sex-related tendencies in youth SCP across two generations

The current study aligns with previous findings that SCP, especially SCP several times a week (Vuori et al. 2004), has increased in Finland over recent decades (Laakso et al. 2008; Mathisen et al. 2019). Similar trends have been reported in other Nordic countries, such as Iceland (Eiosdóttir et al. 2008) and Norway (Mathisen et al. 2019). Based on a 2022 report by the European Commission, Finland, along with Denmark, Sweden, Luxembourg, and the Netherlands, has the highest rates of exercise and sports participation in Europe in the twenty-first century (European Commission for Education 2022). Thus, sports clubs play an important role in promoting PA among youth in the twenty-first century.

The observed increase in youth SCP in Finland across the two generations, particularly among younger age groups participating several times a week, suggests a shift toward earlier sports engagement. This tendency likely reflects societal and political changes (Lehtonen 2012; Hoekman et al. 2015) shaping norms and attitudes toward physically active lifestyle, an increase in parental awareness of the health benefits of PA (European Commission for Education 2022), and more diverse sports options (Koski et al. 2015). Notably, many parents now dedicate resources (e.g., time, fees, transportation, equipment, and emotions) to their children's sports, finding it beneficial for both child development and parental satisfaction (Sutcliffe et al. 2024). However, for those participating in a single

sport several times a week, there is a risk of early specialization (defined as engaging in a single sport for over 8 months annually before age 14; Sugimoto et al. 2024). Early specialization has been associated with higher drop-out rates and health risks (Sugimoto et al. 2024), including injury (Jayanthi et al. 2019). Sports medicine organizations encourage multi-sport participation for children and adolescents for balanced physical and psychological benefits (Jayanthi et al. 2019). Thus, it is important to promote fundamental movement skills programs rather than focusing solely on a specific sport in young children.

Lower participation rates among older adolescents compared to younger children align with findings that PA (Lounassalo et al. 2019) and SCP (Vuori et al. 2004; Blomqvist et al. 2019; Emmonds et al. 2024) tend to decline with age. This trend remained consistent across both generations, highlighting the major challenge of sustaining adolescent involvement in organized sports, which is important because sports engagement in adolescence is often linked to lifelong PA (Batista et al. 2019; Lagestad 2019). The primary reasons for dropping out from organized sports among youth include lack of enjoyment, lack of perceived competence, social pressures, competing priorities, and physical factors such as maturation and injuries (Crane and Temple 2015). To retain older adolescents in sports, more flexible and non-competitive options for participation are needed that align with the interests of youth and accommodate their schedules.

The current study showed that in the 1980s, boys were more likely than girls to participate in SCP several times a week, highlighting past sex differences in SCP in Finland. By the 2020s, this difference largely disappeared. The change concerning reduced sex disparity in Finnish youth SCP has been reported in other data as well (Mathisen et al. 2019). Meanwhile, a recent study analyzing data from over 5 million participants aged 8–18 across 27 European countries found that boys were four times as likely to participate in organized youth sports as girls, with this trend consistent across age groups and most sports (Emmonds et al. 2024). Sex disparity in youth SCP in Finland appears to have decreased over the decades, possibly due to advances in sports sector and policy (Lehtonen et al. 2022) and general sex equality, which is higher in Finland than the EU average (EIGE—European Institute for Gender Equality 2023).

Socioeconomic and areal disparities in youth SCP across two generations

As discovered previously (Telama et al. 2009; Post et al. 2023), both SES indicators, family income and parental education, were positively associated with youth SCP. While in the 1980s, income disparities in SCP were seen mainly among 15- and 18-year-olds, by the 2020s, these gaps extended to all younger age groups. A Norwegian

study showed similar results: little evidence of social class differences was found in youth SCP through the 1980s to the early 2000s, while later studies revealed widening SES-based disparities (Strandbu et al. 2017). It might be that the more educated and wealthier parents, with more changes, choices, and resources, are more likely to enroll their children in sports clubs than those with lower SES.

In Finland, key trends in the youth sports sector over recent decades include increased professionalism, differentiation, rising costs, and greater parental involvement (Strandbu et al. 2017; Koski and Mäenpää 2018; Post et al. 2018), all of which may limit access to organized sports for less affluent families. The rising costs of running sports clubs reflect higher standards and expectations (Koski et al. 2015). For example, paid employees, once limited to large competitive clubs, are now common even in smaller clubs (Koski and Mäenpää 2018). Additionally, Finnish parents have learned to be “customers” of sports clubs, reflected, for example, in the decrease in volunteer fundraising in sports clubs - down by one third between 1986 and 2006 (Koski 2012). As seen in studies from other developed countries (Vandermeerschen et al. 2016; Hobza et al. 2022; Post et al. 2023), this direct association between SES and SCP shows how SES increasingly shapes youth SCP and widens disparities.

While SES is associated with youth organized sports (Telama et al. 2009), it does not necessarily impact general PA levels in children (Nielsen et al. 2012). For example, a Finnish study found no difference between high and low SES families in unorganized or school-based PA (Telama et al. 2009). To promote inclusivity, affordable and flexible PA options, such as school-based activities (e.g., physical education, structured recess breaks, active school breaks, after-school multi-sport clubs), neighborhood playgrounds for self-organized activities, and accessible public community-based sports facilities, should be provided and prioritized. These options can make PA more accessible to children of all socioeconomic backgrounds.

The study highlights the influence of geographical region and residential area on SCP across both generations. Living in Western-Southern Finland was associated with higher SCP in the 2020s when compared to those living in Eastern-Northern Finland, especially among younger children. This difference may be due to work-related migration from Northern and Eastern Finland to the South and Southwest, regions with higher SES (Fina et al. 2021), over recent decades (Heikkilä 2003). Rural youth, especially in sparsely populated areas, were less likely to engage in SCP several times a week compared to urban youth. Previous findings also showed remoteness associated with decreased SCP (Palomäki and Heikinaro-Johansson 2011; Eime et al. 2015), likely due to fewer sports clubs, programs, and facilities (Koski et al. 2015),

as well as longer travel distances in rural areas (Yousefian et al. 2009).

This may contribute to regional disparities in SCP, particularly with the ongoing urbanization since the 1960s (Koski and Mäenpää 2018). Transportation challenges in rural areas make school-based physical activities critical, often the only way for children and adolescents to be active. In Finland, the long distances in the sparsely populated areas can make walking and biking an unrealistic option for youth, and even traveling by car may be a challenge. Addressing rural transportation issues, such as offering late school buses and car pools, could provide affordable access to sports after school for children living in rural areas (Yousefian et al. 2009). It has also been suggested that collaboration with municipalities and community organizations, such as parks and recreation centers, could strengthen youth sports programs and increase local capacity in less affluent areas (Kellstedt et al. 2021).

Strengths and limitations

The strengths of this study include its two-generation population-based sample representing both sexes. The study design enabled the assessment of changes in SCP over time between the original YFS population (G1) living their youth in the 1980s and their offspring's SCP in the 2020s (G2). The study population was extensive, with over 3000 participants from the 1980s and over 1000 participants from the years 2018–2020. SCP was assessed at different ages during childhood and adolescence, providing a wide perspective on the prevalence of youth SCP. This is important because PA tends to decline among these age groups (Lounassalo et al. 2019). The study identified several factors contributing to disparities in youth SCP. However, the explanatory power of the multinomial logistic regression analysis, based on Cragg and Uhler's pseudo-*R*-squared, was relatively weak (0.09–0.29), indicating that the majority of the variation in participants' SCP remains unexplained by the correlates in the selected models. Other factors potentially contributing to SCP disparities, such as disabilities (Sahlin and Lexell 2015), injuries (Pandya 2021), attitudes (Adell et al. 2019), perceived physical competence (Mehtälä et al. 2020), socio-cultural norms (Sport England 2004), ethnic and cultural background (Wijtzes et al. 2014), discrimination (Kalina and Moustakas 2024), social support (Sheridan et al. 2014), parental PA (Van Der Horst et al. 2007; Schoeppe et al. 2016), parental co-participation in PA (Laukkanen et al. 2018), and parental experience in youth sports (Sutcliffe et al. 2024), were not included in this study.

This study also has limitations regarding the generalization of results, as the findings may either overestimate or underestimate the true associations. First, the longitudinal design of this study with the G1 population resulted in

some participants being included in the data multiple times, for example, once as a 12-year-old and later as a 15-year-old. This approach utilized all available data from each age group. Second, while the original YFS population (G1) was randomly selected and representative of the general population, the G2 group was not, as they were the offspring of the G1 participants. Additionally, the G2 data include some siblings, whose results may be more closely correlated with each other than with those of non-siblings. Third, the G1 participants in the analytical sample may differ systematically from those who dropped out of the study. Previous attrition analysis shows that remaining G1 participants were more often female and older than those who dropped out, but did not differ, for example, by PA or parents' study years (Raitakari et al. 2008). Finally, the age structure differs between the two generations, which may affect comparability: G1 cohorts were sampled and followed at steady 3-year intervals, while the coincidental age distribution of G2 participants was grouped into four broader corresponding age categories.

Conclusion

This study revealed changes in Finnish youth SCP across two generations, with an increase in overall SCP from the 1980s to 2020s, especially among girls and younger children. However, SCP dropout rates remained high as youth aged. Although sex equality in SCP seemed to improve over time, inequalities based on socioeconomic and geographical factors became more pronounced. The disparities in SCP highlight the need for targeted public health policies and actions to ensure equitable access to youth sports, considering factors such as age, sex, socioeconomic background, and residential area. Globally in 2016, more than 80% of 11–17-year-old adolescents did not meet current recommendations for daily PA (Guthold et al. 2020). Thus, despite the increase in the proportion of participants in organized sports across generations in Finland, additional efforts are needed in the society and sports sector to address insufficient PA among youth. Future research should further explore SCP disparities and assess interventions to promote inclusive sports across demographics. Additionally, research should examine how specific sports-related behaviors are passed down from parents to offspring.

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Availability of data, material, and codes The data from this study are not publicly available for ethical and legal reasons. Investigators can submit an expression of interest to the Young Finns Study (YFS) by contacting Professor Olli Raitakari, Project Director of the YFS (olli.raitakari@utu.fi).

Declarations

Ethical considerations and ethics approval The study followed the principles of good scientific practice laid down by the Helsinki Declaration. The study protocol was approved by the local ethics committees of the universities involved in the YFS. Participation in the study was voluntary, with participants having the right to withdraw at any point. All data were treated confidentially, and personal data were pseudonymized. The funding organizations played no role in conducting the study.

Consent to participate Written informed consent was obtained from all participants or legal guardians.

Consent for publication Not applicable as no individual data or images were published.

Competing interests The authors declare no potential conflicts of interest with respect to the research, authorship, and publication of this article.

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