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After the bell: adolescents' organised leisure-time activities and well-being in the context of social and socioeconomic inequalities

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ABSTRACT

Background Previous research has linked adolescents' participation in organised leisure-time activities (OLTAs) to better health and well-being. It remains unclear whether these associations can be observed consistently across social and socioeconomic strata and countries.

Methods The present study used nine nationally representative samples of adolescents aged 11, 13 and 15 years (total n=55 429) from the 2017/2018 Health Behaviour in School-aged Children survey from Europe and Canada. Regression models with mixed effects to account for nested nature of data were applied to estimate: (1) the associations of social and socioeconomic factors with OLTA participation; (2) strengths of the associations between breadth and pattern of OLTA participation with health and well-being indicators, after adjustment for the social and socioeconomic factors.

Results Rates of OLTA participation varied by age, sex and country of adolescents. Participants from lower socioeconomic classes and non-nuclear families were less likely to participate in OLTAs across each of the nine countries. Moreover, breadth of OLTA participation was associated with higher well-being independent of socioeconomic status or family structure. All of the participation patterns were associated with higher life satisfaction, but sports (either alone or in combination with a non-sport OLTA) were also associated with fewer psychological complaints and excellent self-rated health.

Conclusion Adolescents' engagement in OLTAs was associated with adolescents' subjective well-being regardless of country, age, sex and variance in social and socioeconomic factors. Policies aimed at increasing adolescents' subjective well-being and OLTA participation should focus on adolescents from low socioeconomic classes and non-nuclear families.

INTRODUCTION

Leisure time constitutes a significant portion of adolescents' daily routines and contributes significantly to their development and general well-being.[1 2] Participation in leisure time can span from engagement in informal/unstructured to organised activities. Organised leisure-time activities (OLTAs) often occur within contexts that are sufficient to nurture adolescents' strengths, thus promoting positive youth development.[3 4] Participation in sports, arts or youth organisations is associated with higher levels of psychosocial adjustment, and also relates to better school performance and attainment[5 6] and enhanced health and well-being.[7 8]

Associations between leisure-time activities and such social and health outcomes vary by breadth of participation. Concurrent participation in multiple different types of OLTAs also may enhance well-being among adolescents.[8 9] The type of OLTAs and associated patterns of participation matter too. To illustrate, sport represents one of the most prominent types of OLTAs—engagement in sport is very common among youth in Europe and North America.[7 10 11] Sport is well known to be beneficial for adolescent health and development,[12 13] especially in combination with other non-sport OLTAs.[11 14]

Engagement in OLTAs depends in part on intrinsic motivation.[3] Rates of participation are known to differ by adolescents' sex, age or social background. Younger adolescents tend to participate more than do their older peers,[7 9] and different sociodemographic patterns can be found when studying different types of OLTAs.[13 15] Adolescents from families with lower socioeconomic status (SES) are less likely to participate in OLTAs[16] and social inequalities are also evident in adolescent well-being.[17] Likewise, the nature of family environments (structure or social supports in place) has been linked to both adolescents' well-being[18] and their participation in OLTAs;[15 19] those from nuclear families report both higher well-being and are more likely to participate. Participation in OLTAs is also related to better psychological adjustment across all SES groups.[20] Given the limited resources available to adolescents from disadvantaged settings, fostering participation in OLTAs could act as a strategy to address widening gaps in health and well-being observed between social classes, and to minimise social inequalities in adolescent well-being, analogous to findings reported for academic achievement.[21]

Recently, Sauerwein and Rees[2] studied existing profiles of leisure-time use across 14 distinct countries and found that leisure-time experience was related to individual social and economic backgrounds rather than to being situated in a particular country. Moreover, they pointed to a lack of cross-national comparative studies on the subject of youth leisure time. Consequently, it remains unclear whether the proposed associations between engagement in OLTAs and measures of health and well-being can be observed consistently between diverse

socioeconomic and social contexts across different countries. In the current study, we aimed to: (1) investigate the patterns and breadth of participation in OLTAs across nine countries from different parts of Europe (Western, Central, Eastern and Northern) and Canada with divergent social and socioeconomic contexts, and (2) examine the strength and consistency of associations between participation in OLTAs and reports of adolescent well-being, while considering the potential modifying effects of social and socioeconomic context across different countries. Based on the conclusions made by Sauerwein and Rees,[2] we assumed that OLTA participation patterns would manifest in terms of similar socioeconomic differences across the countries and that such participation would also be associated with health and well-being, regardless of the country.

METHODS

Study participants

Data were available from the international Health Behaviour in School-aged Children (HBSC) study conducted in 2017/2018. In this WHO-affiliated study, each participating country is required to comply with an international research protocol that outlines standard sampling procedures, data

coding and processing methods. Nationally representative samples are generated for children aged 11, 13 and 15 years. All participating countries employed a stratified cluster sampling strategy, with classes nested within schools as the primary sampling unit. Data were collected using a standardised and validated questionnaire. Adolescents' participation was anonymous and voluntary, and no incentives were offered for participation. The research has conformed to the principles embodied in the Declaration of Helsinki.

The primary focus of the current analysis was participation in OLTAs reported by these students. Participation was identified using an optional HBSC questionnaire module available in nine countries: Armenia, Belgium (Flemish region), Canada, Czechia, Latvia, Republic of Moldova, Poland, Russia and Slovakia. The cross-national sample involved 56 952 participants with valid questionnaires from these nine countries, of which 55 429 adolescents provided responses to the OLTA module.

Design

This study involved a cross-sectional analysis of available international data. The primary independent (exposure) variables were measures of participation in OLTAs. The dependent (outcome) variable was a measure of adolescent well-being. Relationships between OLTA participation and well-being were examined while considering the influences of variables describing various social and socioeconomic contexts.

Measures

Organised leisure-time activity participation

Adolescents' participation (yes/no) in six particular types of OLTAs was measured: team sports, individual sports, arts, youth organisations, afterschool clubs/leisure centres and religious activities. These indicators were used to measure adolescents' *breadth* and *patterns of participation* in OLTAs. A test–retest study demonstrated substantial reliability of responses to the instrument.[22] *Breadth of participation* was considered as the number of OLTAs that adolescents were involved in concurrently, ranging from no activity to six activities. *Patterns of participation* were measured by distinguishing four categories: (1) no participation in any of the OLTAs, (2) participation in non-sport OLTAs only (ie, any OLTA except for team and/or individual sports), (3) participation in sport OLTAs only (ie, only team and/or individual sports) and (4) participation in both non-sport and sport OLTAs.

Social contexts

The HBSC *Family Affluence Scale* (FAS III) was used to measure SES. This proxy-indicator is used to assess families' material assets based on six items: number of cars, number of bathrooms, number of computers/laptops, number of holidays abroad in the past 12 months, having own bedroom and dishwasher ownership. Item scores were summed and then transformed into a ridit score for each country separately,[23] with the score ranging from 0 (low SES) to 1 (high SES), representing the adolescents' relative family affluence in their country of residence. Next, FAS was categorised into low (0–20th percentile), medium (21st–80th percentile) and high (81st–100th percentile) SES groups within each country based on these scores, consistent with the recommended approach to treat FAS III for studies using cross-national HBSC data.[24]

Family structure was assessed by asking adolescents who they live with at the home where they live all or most of the time. Response options were: *mother, father, stepmother (or father's girlfriend/partner), stepfather (or mother's boyfriend/partner), someone or somewhere else (eg, siblings, grandparents)* and *foster or children's home*. Four categories of family structure were derived then: nuclear family (consisting of two parents and their child), single-parent family, stepfamily and non-parental family.

We also included mean scores of the *family* (α=0.94) and *peer support* (α=0.92) subscales of the Multidimensional Scale of Perceived Social Support,[25] given the possible confounding role of social support in the associations between OLTA and mental well-being.

Subjective well-being

Four measures were used to assess adolescents' well-being. *Life satisfaction* was measured using the Cantril ladder, a visual analogue 11-point scale for rating how adolescents feel about their life at present (*worst possible life=0* to *best possible life=10*). This ladder is easily understood and a reliable instrument in adolescent populations.[26]

The HBSC symptom checklist[27] was applied to assess the frequency of four *somatic complaints* (headache, backache, stomach ache and feeling dizzy) and four *psychological complaints* (feeling low, bad temper or irritability, feeling nervous and difficulties falling asleep) experienced in the last 6 months. Each item included a five-point response scale ranging from *rarely or never=0* to *about every day=4*. An absolute summary score (0–16) was computed for both subscales separately (α=0.68 and 0.74, respectively), with higher scores indicating more frequent complaints.

Self-rated health was assessed by asking adolescents *Would you say your health is…?* Pursuant to a recommended classification system,[28] four response options (*poor, fair, good* and *excellent*) were dichotomised as *excellent health* versus all other self-rated health states.

Statistical analyses

Analyses were conducted using IBM SPSS V.22 and R 3.6.3 software. Sex and age differences in the prevalence of six types of OLTA participation, non-participation in OLTAs and the breadth of OLTA participation were assessed. χ^2 tests with Rao-Scott correction were applied to account for the complex survey design.

A series of multilevel linear and logistic regression analyses were performed accounting for the hierarchical data structure (individuals nested within schools then countries). The R package 'lme4' was used to fit the linear and generalised linear multilevel models with a Restricted Maximum Likelihood approach. First, we assessed the variability at the country and school level by fitting empty models without other predictors. Second, the associations between demographic then socioeconomic factors with the breadth and the pattern of adolescents' OLTA participation were examined. Third, we estimated the strength and significance of associations between the breadth and the pattern of adolescents' OLTA participation with the various well-being indicators. Finally, we included interaction terms that considered OLTA participation with each of the SES and family structure measures, respectively, to examine their potential modifying role in the associations of both the dimensions of OLTA participation with well-being indicators (online supplemental tables 1–4). All multilevel models analysing the associations of OLTA participation with well-being indicators were controlled for sex, age, SES, family structure and family and peer support.

RESULTS

Sociodemographic characteristics of the sample (n=55 429), the level of the perceived social support and data on four subjective well-being measures are displayed in table 1.

Participation rates varied substantially by age and sex, as well as country, for the six specific OLTAs across countries (table 2). The proportion of girls not involved in any OLTA was significantly higher compared with boys in two countries (Armenia and Moldova), and significantly lower in two others (Canada and Czechia).

With respect to specific types of OLTA, the proportion of boys participating in team sports was higher compared with girls (57.9% vs 37.0%), while attending an art school or club was more prevalent in girls than boys (48.1% vs 23.4%). This held true both cross-nationally and within countries. In the total sample, sex-differences in the prevalence of other OLTAs were absent. However, we observed a mixed picture for sex differences concerning participation in individual sports, youth organisations and after-school/leisure clubs across countries (table 2).

A consistent pattern was observed regarding age (table 3). Older respondents exhibited a lower breadth of OLTA participation (the mean number of OLTAs was 1.85 in 11-year-olds; 1.41 in 15-year-olds) and a higher percentage of non-participants in OLTA (13.0% in 11-year-olds; 23.6% in 15-year-olds) than their younger peers. A similar result was found for all six types of OLTAs in the countries, with only a few exceptions.

Table 4 shows the associations between the demographic, social and socioeconomic variables with the breadth and the pattern of adolescents' OLTA participation. A higher breadth of OLTA participation was observed in adolescents from the middle (β=0.22) and high (β=0.49) SES groups compared with their low SES counterparts. Compared with nuclear families (operationally defined as mother, father and their child), the breadth of OLTA participation was lower in single-parent families (β=−0.08) and especially in stepfamilies (β=−0.12).

Independent of the OLTA participation pattern (ie, only non-sport OLTAs, only sport OLTAs and a combination of both), the odds for participating increased with higher SES (table 4). The socioeconomic gradient was most notable for participation in both sport and non-sport OLTAs (OR=3.68 for high vs low SES). Adolescents from nuclear families were more likely to report any pattern of OLTAs participation compared with their peers with another family structure.

Fully adjusted models examining OLTA participation (both breadth and pattern) and the well-being indicators are provided in table 5. Engagement in a wide breadth of OLTAs concurrently was associated with fewer psychological complaints (β=−0.09), higher life satisfaction (β=0.12) and with higher odds of excellent self-rated health (OR=1.16), but also with more frequent occurrence of somatic health complaints (β=0.04).

Regardless of the pattern, OLTA participation was associated with higher life satisfaction (ranging from β=0.15 for only non-sport OLTAs to β=0.43 for participation in both sport and non-sport OLTAs). Those involved only in sport or combining sport and non-sport OLTAs further indicated fewer psychological complaints (β=−0.60 and β=−0.43, respectively) and had higher odds of rating their health as excellent (OR=1.67 and OR=1.68, respectively) compared with non-participants in OLTAs. Lower presence of somatic complaints was however exclusively observed in the category of only sport participants (β=−0.21).

To determine whether the associations of OLTA participation with well-being indicators were stable across SES classes and different types of families, we tested a variety of models with interaction terms. There was no clear or consistent indication of such interactions for the outcomes of somatic complaints and self-rated health, and only a few for life satisfaction and psychological complaints (online supplemental tables 1–4).

DISCUSSION

In this study, we present novel information on the participation of young people in OLTAs from nine countries in different regions of Europe and Canada. These countries include a diverse array of sociocultural and socioeconomic contexts. Our most important findings were the identification of different rates of participation in OLTAs across these countries, with associated variations in various social determinants of OLTA participation, as well as specific indicators of health and well-being. Our findings highlighted the fact that participation in OLTAs is positively linked to adolescents' well-being regardless of any underlying social and socioeconomic differences, consistent with past reports.[5 7 20] We also observed that as the breadth of participation in OLTAs rose, this rise was significantly associated with higher life satisfaction, less psychological complaints and better self-rated health among adolescents, which accords with findings documented historically.[29] In addition, our findings further emphasise the unique contributions of distinct OLTA participation patterns on various aspects of adolescents' well-being.[30] They also reinforce the protective role of sports on well-being, in line with other research.[31]

It appears that the effects of family structure and SES on the participation in OLTAs among adolescents are similar across countries with diverse cultural and economic backgrounds. Adolescents from 'non-nuclear' or more impoverished families face more challenges and obstacles in their OLTA participation, as has been found previously.[32] We found strong and consistent associations between participation in OLTAs and the indicators of well-being that were stable across socioeconomic groups and distinct family structure models. This implies that health promotion policies should consider interventions implementing youth-appealing OLTAs aiming at low-income families, and families with single or cohabiting parents to avoid widening the gap between social classes and minimise socioeconomically determined inequalities in adolescents' well-being.[33]

Table 1 Description of study samples by country and for the total sample

	Armenia (n=4448)	Belgium (n=4214)	Canada (n=12 523)	Czechia (n=11 392)	Latvia (n=4372)	Moldova (n=4614)	Poland (n=5164)	Russia (n=4131)	Slovakia (n=4571)	Total sample (n=55 429)
Individual characteristics										
Sex (n, %)										
Boys	2155 (48.4)	2067 (49.1)	6111 (48.8)	5676 (49.8)	2159 (49.4)	2310 (50.1)	2531 (49.0)	1969 (47.7)	2333 (51.0)	**27 351 (49.3)**
Girls	2293 (51.6)	2147 (50.9)	6412 (51.2)	5716 (50.2)	2213 (50.6)	2304 (49.4)	2633 (51.0)	2162 (52.3)	2238 (49.0)	**28 078 (50.7)**
Age category (n, %)										
11	1396 (31.4)	1614 (38.3)	3451 (27.9)	3720 (32.7)	1519 (34.9)	1556 (33.7)	1682 (32.6)	1118 (27.1)	1530 (33.5)	**17 586 (31.8)**
13	1570 (35.3)	1203 (28.5)	4735 (38.3)	3899 (34.2)	1501 (34.5)	1524 (33.0)	1706 (33.1)	1303 (31.5)	1808 (39.6)	**19 249 (34.8)**
15	1482 (33.3)	1397 (33.2)	4186 (33.8)	3773 (33.1)	1336 (30.7)	1534 (33.2)	1769 (34.3)	1710 (41.4)	1233 (27.0)	**18 420 (33.3)**
Family structure (n, %)										
Nuclear family	3487 (90.0)	2746 (68.8)	8449 (68.8)	7615 (69.8)	2685 (62.1)	3213 (71.0)	3987 (77.8)	2817 (68.6)	2730 (74.4)	**37 729 (71.4)**
Single-parent family	355 (9.2)	770 (19.3)	2250 (18.3)	1824 (16.7)	1019 (23.5)	896 (19.8)	804 (15.7)	718 (17.5)	580 (15.8)	**9216 (17.4)**
Stepfamily	13 (0.3)	378 (9.5)	1190 (9.7)	1154 (10.6)	451 (10.4)	182 (4.0)	244 (4.8)	499 (12.1)	248 (6.8)	**4359 (8.3)**
Non-parental family	18 (0.5)	100 (2.5)	392 (3.2)	317 (2.9)	172 (4.0)	237 (5.2)	89 (1.7)	75 (1.8)	111 (3.0)	**1511 (2.9)**
Social support (M, SD)										
Family support*	5.92 (1.79)	5.87 (1.50)	5.04 (1.82)	5.05 (2.22)	5.55 (1.76)	5.76 (1.96)	5.51 (1.53)	5.55 (1.76)	5.79 (1.65)	**5.41 (1.89)**
Peer support*	5.53 (1.87)	5.61 (1.49)	4.87 (1.79)	4.65 (2.04)	4.90 (1.73)	4.94 (1.91)	4.46 (1.65)	4.62 (1.94)	5.16 (1.76)	**4.90 (1.86)**
Subjective well-being (M, SD)										
Life satisfaction†	8.35 (1.77)	7.80 (1.42)	7.32 (1.95)	7.78 (1.74)	7.40 (1.93)	8.25 (1.69)	7.48 (1.94)	7.43 (2.03)	7.64 (1.83)	**7.67 (1.86)**
Somatic complaints‡	2.30 (3.09)	2.92 (2.93)	3.48 (3.46)	2.70 (2.75)	3.33 (3.55)	3.39 (3.47)	3.08 (3.09)	3.37 (3.57)	3.28 (3.24)	**3.11 (3.25)**
Psychological complaints‡	4.50 (4.08)	5.00 (3.61)	5.20 (4.12)	5.72 (3.91)	5.67 (4.38)	4.69 (4.07)	6.02 (4.29)	4.39 (4.19)	5.47 (3.75)	**5.27 (4.08)**
Self-rated health§	1288 (29.5%)	1063 (25.4%)	3716 (30.1%)	2706 (23.8%)	934 (21.4%)	1411 (30.6%)	1127 (21.9%)	1256 (30.7%)	1245 (27.3%)	**14 746 (26.8%)**

Nine countries from the 2017/2018 HBSC survey (n=55 429).
Data for social support and subjective well-being from Canada and Czechia were weighted using poststratification regional weights. Number of missing values in the total sample was: age category (173 cases ; 0.3% of the total sample), family structure (2614; 4.7%), family support (3941; 7.1%), peer support (2498; 4.5%), life satisfaction (744; 1.34%), somatic complaints (2190; 4.0%), psychological complaints (2249; 4.1%) and self-rated health (404; 0.7%).
*Range: 1–7.
†Range: 0–10.
‡Range: 0–16.
§n and % for excellent self-rated health.
HBSC, Health Behaviour in School-aged Children; M, mean; SD, standard deviation.

Table 2 Prevalence rates of participation in OLTAs by country and sex

	Team sport (%)			Individual sport (%)			Art (%)			Youth organisation (%)			Leisure club (%)			Religious (%)			Non-participation in OLTAs (%)			Breadth of OLTA participation (M (95% CI))	
	Boy	Girl	X^2	Boy	Girl	X^2	Boy	Girl	X^2	Boy	Girl	X^2	Boy	Girl	X^2	Boy	Girl	X^2	Boy	Girl	X^2	Boy	Girl
Armenia (n=4448)	**49.7**	23.8	<0.001	**37.2**	17.0	<0.001	22.1	**46.1**	<0.001	**9.8**	7.5	0.007	**19.4**	15.9	0.003	10.1	10.2	0.932	21.3	**30.6**	0.001	**1.48** (1.43 to 1.54)	1.20 (1.16 to 1.25)
Belgium (n=4214)	**55.2**	27.0	<0.001	32.1	**40.6**	<0.001	18.5	**45.6**	<0.001	27.0	**30.7**	0.015	**8.5**	6.4	0.019	3.1	4.0	0.162	16.5	18.1	0.380	1.44 (1.40 to 1.49)	**1.54** (1.50 to 1.59)
Canada (n=12 523)	**62.1**	50.2	<0.001	34.0	**36.9**	0.005	22.5	**43.8**	<0.001	9.2	**11.1**	<0.001	**20.1**	16.0	<0.001	20.9	22.1	0.050	**16.5**	14.6	<0.001	1.69 (1.66 to 1.72)	**1.80** (1.77 to 1.83)
Czechia (n=11 392)	**58.6**	35.4	<0.001	31.5	**42.2**	<0.001	25.0	**59.7**	<0.001	**15.0**	13.0	0.003	23.1	**25.3**	0.008	8.0	8.4	0.357	**14.9**	11.5	<0.001	1.61 (1.58 to 1.64)	**1.84** (1.81 to 1.87)
Latvia (n=4372)	**54.7**	27.6	<0.001	37.5	36.3	0.503	27.1	**56.8**	<0.001	**12.2**	7.5	<0.001	11.0	9.7	0.244	8.3	8.0	0.776	16.4	14.6	0.145	**1.51** (1.46 to 1.56)	1.46 (1.42 to 1.50)
Moldova (n=4614)	**71.0**	44.1	<0.001	**43.9**	36.7	<0.001	35.7	**53.5**	<0.001	21.7	21.0	0.598	**29.6**	23.7	<0.001	14.0	12.9	0.405	11.5	**15.4**	0.001	**2.16** (2.10 to 2.22)	1.92 (1.86 to 1.98)
Poland (n=5164)	**50.6**	32.6	<0.001	26.5	26.2	0.831	13.0	**27.0**	<0.001	10.8	11.1	0.719	12.6	13.0	0.708	17.7	17.5	0.892	29.8	31.1	0.343	**1.31** (1.26 to 1.36)	1.27 (1.23 to 1.32)
Russia (n=4131)	**48.6**	28.8	<0.001	**39.9**	34.3	<0.001	26.3	**48.1**	<0.001	10.0	8.6	0.090	23.5	21.6	0.198	15.1	13.0	0.137	19.8	20.8	0.474	**1.63** (1.57 to 1.69)	1.54 (1.49 to 1.60)
Slovakia (n=4571)	**61.6**	40.8	<0.001	27.7	**35.4**	<0.001	20.7	**46.2**	<0.001	9.4	9.5	0.856	21.6	20.8	0.550	15.9	**19.5**	0.001	18.6	16.6	0.088	1.57 (1.52 to 1.62)	**1.72** (1.67 to 1.77)
Total sample (n=55 429)	**57.9**	37.0	<0.001	33.9	35.2	0.653	23.4	**48.1**	<0.001	13.3	12.9	0.588	19.5	17.8	0.137	13.3	13.8	0.172	17.8	17.8	0.989	1.61 (1.60 to 1.63)	**1.65** (1.64 to 1.66)

Nine countries from the 2017/2018 HBSC survey (n=55 429).
Data are percentages and p-values for the Rao-Scott X^2 test, unless otherwise indicated. Significant differences (p<0.050) according to sex are indicated in bold (highest value). Data from Canada and Czechia were weighted using poststratification regional weights.
CI, confidence interval; HBSC, Health Behaviour in School-aged Children; M, mean; OLTA, organised leisure-time activity.

Table 3 Prevalence rates of participation in OLTAs by country and age

	Team sport (%)			Individual sport (%)			Art (%)			Youth org. (%)			Leisure club (%)			Religious (%)			Non-participation in OLTAs (%)			Breadth of OLTA participation (M (95% CI))		
Age category (yrs)	**11**	**13**	**15**	**11**	**13**	**15**	**11**	**13**	**15**	**11**	**13**	**15**	**11**	**13**	**15**	**11**	**13**	**15**	**11**	**13**	**15**	**11**	**13**	**15**
Armenia (n=4448)	**39.4**	37.8	31.8	29.4	25.7	25.4	**39.1**	35.2	29.2	7.4	8.2	10.3	15.8	**19.9**	16.9	**12.3**	10.8	7.4	21.1	24.4	**32.5**	**1.43**	1.38	1.21
	p<0.001			p=0.056			p<0.001			p=0.098			p=0.005			p<0.001			p<0.001			**1.37 to 1.50**	1.32 to 1.44	1.15 to 1.27
Belgium (n=4214)	**46.2**	40.0	35.4	**40.7**	36.4	31.5	**42.6**	31.2	21.3	**34.9**	25.3	25.1	**10.0**	7.4	4.5	**5.9**	2.2	2.0	9.4	18.3	**25.7**	**1.80**	1.42	1.20
	<0.001			p=0.003			p<0.001			p<0.001			p<0.001			p<0.001			p<0.001			**1.75 to 1.86**	1.37 to 1.48	1.15 to 1.25
Canada (n=12 373)	**60.4**	56.7	51.0	**43.0**	35.4	29.6	35.3	**36.7**	29.3	**11.7**	10.0	9.1	**23.8**	17.5	13.7	**24.1**	22.2	18.7	11.7	14.2	**19.9**	**1.98**	1.79	1.51
	p<0.001			p<0.001			p<0.001			0.017			p<0.001			p<0.001			p<0.001			**1.94 to 2.03**	1.75 to 1.82	1.48 to 1.55
Czechia (n=11 392)	**52.7**	49.1	39.2	**43.2**	37.0	30.4	**46.5**	44.1	36.5	18.5	14.1	9.6	**32.7**	24.5	15.6	**9.8**	8.3	6.6	8.1	10.5	**21.0**	**2.03**	1.77	1.38
	p<0.001			p<0.001			p<0.001			p<0.001			p<0.001			p<0.001			p<0.001			**1.99 to 2.07**	1.74 to 1.81	1.34 to 1.41
Latvia (n=4356)	**44.3**	40.4	38.2	35.8	36.6	**38.3**	**50.0**	41.6	34.1	8.7	10.9	9.8	**11.8**	10.9	8.1	**9.6**	8.5	5.9	12.3	15.0	**19.6**	**1.60**	1.49	1.34
	p=0.012			p=0.044			p<0.001			0.224			p=0.032			p=0.002			p<0.001			**1.55 to 1.66**	1.43 to 1.54	1.29 to 1.40
Moldova (n=4614)	57.1	60.2	55.2	41.5	39.2	40.1	45.9	46.1	41.7	20.8	18.8	**24.4**	**29.2**	25.7	25.0	**17.2**	13.4	9.8	13.9	11.0	**15.4**	**2.12**	2.03	1.96
	p=0.106			p=0.503			0.059			0.015			p=0.038			p<0.001			p=0.006			**2.04 to 2.20**	1.96 to 2.11	1.89 to 2.03
Poland (n=5157)	**47.5**	42.7	34.4	**29.3**	25.4	24.4	**23.7**	18.3	18.4	12.1	10.6	10.2	**15.4**	13.2	9.9	18.2	15.4	19.3	24.5	31.6	**35.1**	**1.46**	1.26	1.17
	p<0.001			p=0.008			p<0.001			0.321			p<0.001			p=0.076			p<0.001			**1.40 to 1.52**	1.20 to 1.31	1.11 to 1.22
Russia (n=4131)	**42.0**	37.6	36.1	**47.8**	34.1	32.1	**44.5**	38.3	32.9	8.9	7.4	10.8	**27.7**	20.0	21.0	23.4	12.9	8.8	12.1	20.5	**25.6**	**1.94**	1.50	1.42
	p=0.046			p<0.001			p<0.001			0.038			p=0.004			p<0.001			p<0.001			**1.86 to 2.02**	1.44 to 1.57	1.36 to 1.48
Slovakia (n=4571)	**56.7**	50.4	46.2	**36.7**	31.4	25.1	**38.0**	33.0	27.3	9.3	10.5	8.1	23.7	**24.0**	14.0	18.9	17.4	16.5	12.0	16.3	**26.4**	**1.83**	1.67	1.37
	p<0.001			p<0.001			p<0.001			0.170			p<0.001			p=0.431			p<0.001			**1.77 to 1.89**	1.61 to 1.73	1.30 to 1.44
Total (n=55 256)	**51.4**	48.5	42.0	**39.4**	34.0	30.5	**40.6**	37.0	30.7	**15.1**	12.3	12.0	**22.6**	19.0	14.5	**15.5**	13.8	11.4	13.0	16.5	**23.6**	**1.85**	1.65	1.41
	p<0.001			p<0.001			p<0.001			0.038			p<0.001			p<0.001			p<0.001			**1.83 to 1.87**	1.63 to 1.66	1.39 to 1.43

Nine countries from the 2017/2018 HBSC survey (n=55 256).
Data are percentages and p-values for the Rao-Scott X^2 test, unless otherwise indicated. Significant differences according to the age category are indicated in bold (highest value). Data from Canada and Czechia were weighted using poststratification regional weights.
CI, confidence interval; HBSC, Health Behaviour in School-aged Children; M, mean; OLTA, organised leisure-time activity.

Table 4 Multivariate associations examining demographic, social and socioeconomic factors with breadth and pattern of OLTAs based on multilevel linear and logistic regression models

	Breadth of OLTA participation		Pattern of OLTA participation					
	Number of OLTAs*		OLTA non-sport (no OLTA=ref.)		OLTA sport (no OLTA=ref.)		OLTA both (no OLTA=ref.)	
	β	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Fixed effects								
Constant	**1.65**	**1.50 to 1.80**	**1.60**	**1.27 to 2.00**	0.96	0.76 to 1.21	**2.09**	**1.47 to 2.96**
Sex (girl=ref.)	**−0.05**	**−0.07 to −0.03**	**0.43**	**0.40 to 0.46**	**1.91**	**1.80 to 2.03**	**0.90**	**0.85 to 0.96**
Age (11 years=ref.)								
13	**−0.22**	**−0.25 to −0.20**	**0.80**	**0.73 to 0.87**	**0.85**	**0.76 to 0.92**	**0.63**	**0.59 to 0.69**
15	**−0.46**	**−0.49 to −0.43**	**0.52**	**0.48 to 0.57**	**0.60**	**0.55 to 0.65**	**0.32**	**0.29 to 0.35**
Relative FAS (low FAS=ref.)								
Medium FAS	**0.22**	**0.20 to 0.25**	**1.51**	**1.40 to 1.63**	**1.59**	**1.48 to 1.71**	**1.91**	**1.77 to 2.05**
High FAS	**0.49**	**0.46 to 0.53**	**1.88**	**1.69 to 2.10**	**2.66**	**2.41 to 2.93**	**3.68**	**3.34 to 4.07**
Family structure (nuclear family=ref.)								
Single-parent family	**−0.08**	**−0.11 to −0.05**	**0.80**	**0.74 to 0.87**	**0.77**	**0.71 to 0.83**	**0.74**	**0.69 to 0.80**
Stepfamily	**−0.12**	**−0.16 to −0.08**	**0.78**	**0.70 to 0.87**	**0.78**	**0.70 to 0.86**	**0.71**	**0.64 to 0.79**
Non-parental family	−0.01	−0.08 to 0.06	**0.67**	**0.55 to 0.81**	**0.68**	**0.57 to 0.81**	**0.76**	**0.64 to 0.90**
Random effects								
Variance (SD)								
Country-level	0.05 (0.23)		0.08 (0.28)		0.09 (0.30)		0.26 (0.51)	
School-level	0.08 (0.28)		0.20 (0.45)		0.17 (0.42)		0.45 (0.67)	

Nine countries from the 2017/2018 HBSC survey (n=48 437).
Data are beta coefficients (β) or OR and 95% CI.
Statistically significant values (p<0.05) are indicated in bold.
*Range: 0–6.
CI, confidence interval; FAS, Family Affluence Scale; HBSC, Health Behaviour in School-aged Children; OLTA, organised leisure-time activity; OR, odds ratio; ref., reference category; SD, standard deviation.

OLTA participation decreased with age in all the countries. At about the age of 13, adolescents may reduce the breadth of OLTAs by more selectively investing their time in particular activities.[34] In addition, the rising influence of peers during adolescence might also be related to changes in leisure time spending patterns, including dropout from OLTAs.[35] The influence of peers and significant others, including coaches, for maintenance of participation in OLTAs has been established.[36 37] Furthermore, adolescents might also leave the OLTAs because they do not feel 'good enough' compared with their peers.[38] Therefore, some reorientation of the goals in OLTAs from a focus on success and mastery of performance towards having fun and socialisation could contribute to reducing dropout rates.[39] However, this does not necessarily apply to all types of OLTAs and the factors

Table 5 Associations between participation in OLTAs and selected well-being indicators: results from adjusted three-level linear and logistic regression models with mixed effects

	Life satisfaction (n=45 683)		Psychological complaints (n=44 693)		Somatic complaints (n=44 754)		Excellent self-rated health (n=45 900)	
	β	95% CI	β	95% CI	β	95% CI	OR	95% CI
Fixed effects								
Breadth of OLTA participation (no OLTA=ref.)								
No. of OLTAs (0–6)	**0.12**	**0.10 to 0.13**	**−0.09**	**−0.12 to −0.07**	**0.04**	**0.02 to 0.06**	**1.16**	**1.14 to 1.18**
Pattern of OLTA participation								
OLTA non-sport	**0.15**	**010 to 0.20**	0.02	−1.00 to 0.14	−0.06	−0.15 to 0.05	1.01	0.93 to 1.09
OLTA sport	**0.37**	**0.32 to 0.42**	**−0.60**	**−0.71 to −0.49**	**−0.21**	**−0.30 to −0.12**	**1.67**	**1.55 to 1.79**
OLTA both	**0.43**	**0.38 to 0.48**	**−0.43**	**−0.54 to −0.33**	−0.05	−0.13 to 0.04	**1.68**	**1.57 to 1.80**
Random effects								
Variance (SD)								
Country	0.12 (0.35)		0.28 (0.53)		0.13 (0.36)		0.03 (0.16)	
School	0.12 (0.34)		0.53 (0.73)		0.32 (0.56)		0.14 (0.37)	

Nine countries from the 2017/18 HBSC study.
Data are beta coefficients (β) or OR and 95% CI. All models were controlled for sex, age category, Family Affluence Scale (FAS), family structure, family and peer support. Statistically significant values (p<0.05) are indicated in bold.
HBSC, Health Behaviour in School-aged Children; OLTA, organised leisure-time activity; ref., reference category.

influencing dropout may be unique for specific OLTAs. Further research to explore such factors is therefore warranted.

Findings from this study demonstrate the importance of organised leisure in the promotion of adolescents' well-being that could form the basis of community-based prevention programmes. Features of such programmes could be made 'cross-culturally transferrable' by targeting disadvantaged populations and involving strategies to combat persistent dropouts from OLTAs observed with age. There would, however, be a need to account for socioculturally determined differences in participation rates or country-specific preferences/offer of different types of OLTAs observed by sex.

With respect to these sex-specific patterns, team sports were the most preferred OLTA reported by boys, whereas arts were most commonly reported by girls. Despite the distinct sociocultural backgrounds inherent to the countries under study, these patterns persisted. Sex-based differences were, however, observed for other types of OLTAs. Russian, Armenian and Moldovan boys were over-represented in OLTAs, especially in sports, compared with girls. This is important as physical activity may mediate associations between sex and mental health outcomes.[40] In such countries where sex-based differences are highest, a priority for health promotion could be to invoke good practices to increase girls' participation in promoting their subjective well-being. As an example, community policies implemented in Finland and Norway led to a 20% increase of girls' sport participation over the last 20–25 years, with differences among boys and girls almost disappearing over the time.[10]

Strengths of our study include its cross-national nature, the large and robust data set, our reliance on validated items and survey protocols, and its novelty in the peer-review literature. It does, however, have several limitations. The cross-sectional study design precludes the possibility of knowing whether participation in OLTAs is causally related to health and well-being, or if the reciprocal is true due to reverse causality. In addition, we did not compile information on intensity or volume of OLTA participation, which could have yielded more detailed findings in relation to socioeconomic or family background influences of our respondents. Sex-related or gender-related sociocultural norms that are specific to different populations too may underlay some findings and were not captured in the present analyses. There is a clear need to identify specific individual and other social factors that mediate the relationships captured in this study. There is also a potential for qualitative studies to identify the motivations and to understand decision-making by adolescents about participating in different OLTAs, with a special focus on those who do not participate.

CONCLUSIONS

This study confirmed that adolescents' engagement in OLTAs is associated with better well-being and perceived subjective health. This finding was identified across all of the nine countries involved and appears to be independent of country, age, sex and SES, family structure or perceived social support. All different expressions of OLTA participation were associated with higher life satisfaction, while sports was especially associated with fewer psychological complaints and excellent self-rated health. Mechanisms that underlie such associations might exist independent of country-specific sociocultural context. Based on observed patterns, health promotion policies aiming to increase adolescents' subjective well-being and OLTA participation should pay specific attention to adolescents from low SES and non-nuclear families.

What is already known on this subject

- Organised leisure-time activities are linked to healthy youth development. However, adolescents from families with lower socioeconomic status are less likely to participate in these sorts of activities. Participation in organised-leisure time activities may in part account for socioeconomic gradients in adolescent well-being.

What this study adds

- Engagement in organised leisure-time activities was associated with better perceived subjective health and well-being in adolescents from nine countries with divergent social and socioeconomic contexts. This held true even following control for other established determinants, including sex, age category, relative socioeconomic status, family structure and perceived social support and, in particular, country. Mechanisms underlying the association between participation in organised leisure-time activities and adolescent well-being are to be likely universal. Health promotion policies aiming to increase adolescents' subjective well-being should support adolescents' participation in organised leisure-time activities, with specific focus on adolescents living in poverty and from non-nuclear families.

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