



Original article

A regional vision of physical activity, sedentary behaviour and physical education in adolescents from Latin America and the Caribbean: results from 26 countries

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Abstract

Background: Latin America and the Caribbean (LAC) countries, have been historically under-represented due to the lack of surveillance of physical behaviours in young populations. Therefore, the aim of this study was to describe and compare overall physical activity (PA), active transportation to and from school (i.e. walking or cycling), physical education (PE) participation, and sedentary behaviour (SB) in adolescents from 26 countries in LAC.

Methods: Data were collected in the Global School-based Student Health Survey (2007–13). Prevalences for each physical behaviour were compared by sex across the region.

Results: In total, 64 034 adolescents provided complete data (age range: 11 to 18 years; 47.7% male). Only about 15% of adolescents in LAC countries were physically active (at least 60 min/day of moderate-to-vigorous PA) with most countries showing sex disparities. Overall, 41.9% reported being active for transportation to and from school at least 3 days per week. In 12 countries, at least 50% of the adolescents reported sitting ≥ 3 h per day outside school, and a third of adolescents reported participation in PE classes on 3 days or more per week.

Conclusions: The study sets a challenge for the LAC region, as physical inactivity and SB are highly prevalent across all countries. Gender inequity was shown in most countries, with boys reporting more active behaviours. Regional and national actions for implementing policies to revert this situation are urgent.

Key words: Physical inactivity, surveillance, active transportation, sitting, inequity, physical education provision, sedentary lifestyle

Key Messages

- Only 15% of adolescents from Latin America and the Caribbean (LAC) countries met the physical activity recommendations.
- Sedentary behaviour was highly prevalent in LAC countries and was positively correlated with the Human Development Index.
- Sex disparities in physical behaviours were shown in most LAC countries.
- Although LAC countries have high levels of policy implementation for physical education in schools, only a third of adolescents reported participation in physical education classes on 3 days or more per week.

Introduction

Physical inactivity and sedentary behaviour (SB) are highly prevalent in adolescents across the world and are affecting not only high-income nations, but also low- and middle-income countries (LMICs).¹⁻³ Therefore, a global call for action has been made to join efforts among countries in order to improve knowledge and change the world trend of increasing physical inactivity and SB.^{4,5} However, some regions, especially Latin America and the Caribbean (LAC), have been historically under-represented due to the lack of surveillance in this age group.⁶

To tackle this multinational issue, the World Health Organization (WHO) planned a Global School Health Survey (GSHS).^{7,8} Since 2003, the GSHS has been implemented to obtain systematic information among 13- to 17-year-old students to support programmes and policies for school and youth health globally. The GSHS offers an opportunity to better understand physical behaviours as a part of monitoring physical activity (PA) and SB,⁷ and includes other related factors that make contributions to increasing the chances of meeting PA recommendations in adolescents, such as active transportation (AT) and physical education (PE).^{9,10}

Advances in monitoring and regional analysis of the current levels of physical behaviours in adolescents will provide a better picture for understanding cross-national differences in LAC countries and, therefore, help in the design of informed policies for PA promotion. The aim of this study was to describe and compare overall PA, PA for transportation, PE participation, and SB in adolescents from 26 countries in LAC.

Methods

Sampling

Public data of 26 countries from LAC included in the GSHS were analysed in those surveys conducted between

2007 and 2013. Country participation was voluntary. A two-stage cluster sample design was used to produce representative data of adolescent students for each country. At the first stage, schools were selected with probability proportional to enrolment size. At the second stage, classes were randomly selected and all students in selected classes were eligible to participate.⁷

All countries provided nationally representative samples, except for Colombia and Ecuador, which provided data from their capital cities only. Questionnaires were self-administered and completed during one regular class period. Student participation was voluntary and private. Informed consent was completed by students, parents and schools' representatives.

Instrument

The GSHS questionnaire included 10 core modules that address the leading causes of morbidity and mortality among children and adults worldwide.⁷ Countries were required to include at least six of the 10 core modules with no changes in their questionnaires.

Age, height and weight were self-reported. Body mass index (BMI) was calculated by dividing the weight in kilograms by height in metres squared. From the median BMI for age and sex, students were categorized as overweight if their BMI was $>+1$ standard deviation (SD) and obese if their BMI was $>+2SD$ using the WHO growth reference.¹¹

PA was assessed with the following question: 'During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? Add up all the time you spent in any kind of physical activity each day'. Adolescents were classified as 'physically active' if they engaged in PA for at least 60 min every day of the week.

The question: 'During the past 7 days, on how many days did you walk or ride a bicycle to or from school?' was

used to assess AT. Adolescents were classified as 'active for transport' if they rode or walked to and from school on at least 3 days during the past 7 days.

PE class participation was assessed by asking: 'During this school year, on how many days did you go to physical education class each week?'

SB was assessed with the question: 'How much time do you spend during a typical or usual day sitting and watching television, playing computer games, talking with friends or doing other sitting activities, such as (country-specific examples)?'. Adolescents were considered 'sedentary' if they spent 3 or more h per day sitting outside school.¹²

Statistical analysis

Participants with missing data for age, sex, number of physically active days, number of days for active transport, number of PE classes per day, and amount of time spent sitting outside school were excluded from the analysis, except for countries in which those core modules were not included. Survey data settings in Stata, version 13 (StataCorp, College Station, TX, USA) were used to consider the weighting for each observation and the two-stage sample design of the GSHS. Data were summarized in medians (percentiles) and percentages [95% confidence interval (CI)]. Relative differences of prevalences for each domain between sexes and by country were also calculated and used as measure of disparity. Logistic regressions were used to assess differences between sexes. Spearman correlational analyses were performed to assess how both prevalences and relative differences between sexes of PA, AT, PE participation and SB were individually correlated to some global and demographic indices, including: the Human Development Index (HDI, 2008–16 data, a high index represents greater human development),¹³ Gender Inequality Index (GII, 2016 data, a higher score represents greater gender inequality)¹⁴ and the Gini Coefficient (GC, 2010–15 data, a higher coefficient represents greater income inequality).^{15,16} The GII was unavailable for most Caribbean countries, such as Cayman Islands, British Virgin Islands, Montserrat, Saint Kitts and Nevis, Grenada, Dominica and Saint Vincent, and the Grenadines (7/26), and the GC was missing for Antigua and Barbuda, Bahamas, Guyana, Montserrat, Saint Kitts and Nevis, and Trinidad and Tobago (5/26). The motorization rate (MR, number of all vehicles per 1000 inhabitants) was also used to assess its correlation with physical behaviours.¹⁷ Age and sex were included for covariate adjustment in comparisons across groups and correlations.

Results

In total, 64 034 adolescents from 26 LAC countries provided complete data out of 79 419 surveyed participants.

Survey and sample characteristics of the study are shown in Table 1. The average response rate was 79.8% and ranged from 60.0% (Chile) to 90.0% (British Virgin Islands, and Trinidad and Tobago). The percentage of male participants ranged from 43.6% (Grenada) to 52.9% (Guatemala). The lowest prevalence of overweight participants was observed in Colombia (10.8%) and the highest was found in Chile (28.6%). Obesity prevalence by country ranged from 1.2% (Colombia) to 21.5% (Argentina). No demographic differences were observed between students with complete data and those excluded because of missing data.

In most countries, boys had more active days per week than girls (Table 2). The weighted average percentage (by population size) of physically active adolescents across LAC countries was 15.5%. The least active adolescents were observed in Saint Vincent and Grenadines (12.8%), and the most active adolescents were from Antigua and Barbuda (22.8%). Only four countries had more than 20% of physically active adolescents (Antigua and Barbuda, Belize, Montserrat, and Trinidad and Tobago) (Figure 1A). The countries with the largest relative differences in percentage of active adolescents between boys and girls were Chile (49.2%), Costa Rica (51.0%), and Uruguay (60.1%). Only the relative difference between active boys and girls per country was positively correlated with the HDI ($\rho = 0.50$, $P = 0.01$) and negatively correlated with the GII ($\rho = -0.58$, $P = 0.01$) (Supplementary Figures, available as Supplementary data at *IJE* online). No correlations were observed between PA and the other indices (GC ($P = 0.32$), MR ($P = 0.11$)).

Overall, the median days active for transport to and from school ranged from 0 to 4 days per week (Table 3). The weighted prevalence of AT in adolescents from LAC was 41.9%, with large variability between countries (Figure 1B). The three countries with higher prevalence of AT (Peru, Argentina and Uruguay) were also those with higher median number of active days (median = 4). The largest relative differences in the percentage of active adolescents in transportation between the sexes were observed in Cayman Islands (36.2%), Saint Lucia (24.9%) and Colombia (21.0%). The only two countries that reported higher median number of days active for transport in women were Colombia and Peru. The overall prevalence of AT in adolescents by country was positively correlated with the GC ($\rho = 0.51$, $P = 0.022$) (Supplementary Material, available as Supplementary data at *IJE* online), whereas no correlation was observed between AT and the other indices (GII ($P = 0.98$), HDI ($P = 0.48$) and MR ($P = 0.51$)).

Nineteen countries provided information about PE participation among adolescents (Table 4). Five countries reported that less than 20% of adolescents went to PE

Table 1. Survey year, response rate, sample size and characteristics for each Latin American and Caribbean country included in the study

Country	Survey year	Response rate (%)	Total sample ^b	Mean age (95% CI)	Male %	Overweight %	Obesity %
Antigua and Barbuda	2009	67	1112	13.9 (13.9–14.0)	51.9	–	–
Argentina	2012	71	16 383	14.4 (14.3–14.4)	48.2	21.9	6.0
Bahamas	2013	78	1124	13.5 (13.4–13.6)	47.0	23.6	21.5
Barbados	2011	73	1266	14.2 (14.1–14.2)	50.4	17.6	14.6
Belize	2011	88	1834	13.9 (13.6–14.1)	47.9	23.2	13.3
Bolivia	2012	88	3296	14.4 (14.2–14.6)	50.8	17.8	4.8
British Virgin Islands	2009	90	1429	14.1 (14.0–14.1)	47.4	20.1	19.9
Cayman Islands	2007	79	1162	13.9 (13.9–14.0)	48.8	20.9	12.8
Chile	2013	60	1888	15.1 (14.8–15.4)	48.3	28.6	14.1
Colombia ^a	2007	83	1705	14.2 (13.9–14.5)	45.8	10.8	1.2
Costa Rica	2009	72	2601	14.3 (14.1–14.5)	50.4	19.1	9.0
Dominica	2009	84	1464	14.0 (13.7–14.4)	50.4	16.3	10.1
El Salvador	2013	88	1783	14.2 (14.1–14.4)	51.7	19.7	9.2
Ecuador ^a	2007	86	2105	13.4 (13.2–13.7)	51.3	24.2	8.3
Grenada	2008	78	1364	14.1 (13.7–14.4)	43.6	–	–
Guatemala	2009	81	5194	14.3 (14.2–14.4)	52.9	20.0	7.6
Guyana	2010	76	2215	14.3 (14.2–14.5)	48.1	11.1	4.4
Honduras	2012	79	1644	13.9 (13.7–14.0)	46.7	13.1	5.2
Montserrat	2008	78	194	14.3 (14.1–14.5)	45.8	–	–
Peru	2010	85	2806	14.4 (14.3–14.5)	50.5	16.9	3.0
Saint Kitts and Nevis	2011	70	1627	14.5 (14.4–14.5)	50.3	18.4	14.2
Saint Lucia	2007	82	1227	14.1 (13.7–14.4)	45.0	–	–
Saint Vincent and Grenadines	2007	84	1191	13.7 (13.3–14.0)	45.8	–	–
Suriname	2009	89	1568	14.7 (14.5–15.0)	49.0	13.2	6.8
Trinidad and Tobago	2011	90	2543	13.7 (13.6–13.9)	48.9	15.4	14.0
Uruguay	2012	77	3309	14.4 (14.3–14.5)	45.4	19.7	6.9

^aOnly regional representation.^bParticipants with no missing data.

classes on ≥ 3 days each week (Figure 1C). Adolescents from El Salvador (37.8%), Uruguay (34.8%) and Costa Rica (34.0%) were those with higher percentages of participation in PE on ≥ 3 days per week. Higher PE participation among boys than girls on 3 or more days per week was observed only in Argentina ($P < 0.001$), Guatemala ($P = 0.001$) and Saint Lucia ($P = 0.001$). Two countries showed 30% or more adolescents that reported PE participation on 5 or more days per week (Costa Rica and El Salvador). PE participation was not correlated with any of the global indices.

The percentages of adolescents who reported sitting 3 or more h per day outside school are shown in Table 5. Overall, the percentages of sedentary adolescents ranged from 24.2% (Guatemala) to 65.0% (Barbados). In 12 countries, at least 50% of the adolescents reported sitting ≥ 3 h per day outside school (Figure 1D). Eleven countries showed differences in sitting between sexes, with higher percentages observed among girls for all of them. The largest relative differences between girls and boys were found in Trinidad and Tobago (18.8%), Bahamas (19.4%) and

Saint Kitts and Nevis (21.8%). The prevalence of sedentary adolescents by country was positively correlated with HDI ($\rho = 0.79$, $P = 0.001$) and negatively correlated with GII ($\rho = -0.74$, $P = 0.001$) (Supplementary Material, available as Supplementary data at *IJE* online). Countries with higher HDI showed smaller relative differences between boys and girls in SB than those with lower HDI ($\rho = -0.58$, $P = 0.002$).

Discussion

This study summarized nationally representative data regarding PA, SB, AT and PE participation among adolescents from 26 countries across LAC. Overall, boys were more physically active than girls in 18 of 26 countries (69.2%). Most prevalence differences in AT favoured boys, except for Colombia. PE participation on 3 or more days each week ranged from 2.2% (Peru) to 37.8% (El Salvador), but sex differences in PE participation were observed in only three countries. The prevalence of adolescents who spent 3 or more h per day in SB outside school

Table 2. Median (P25–P75) days per week that adolescents engaged physical activity for at least 60 min and the percentage of physically active adolescents in Latin America and the Caribbean

Country	Median active days per week (P25–P75)				Percentage of physically active adolescents on 7 days per week (95% CI)			
	Overall	Male	Female	P	Overall	Male	Female	P
Antigua and Barbuda	2 (0–6)	3 (0–7)	2 (0–5)	<0.001	22.8 (20.3–25.6)	28.5 (24.5–32.9)	16.7 (13.9–20.1)	<0.001
Argentina	3 (1–5)	3 (2–6)	2 (1–4)	<0.001	16.7 (15.6–17.8)	21.7 (20.2–23.2)	12.1 (11.0–13.4)	<0.001
Bahamas	2 (0–4)	2 (0–5)	1 (0–4)	0.001	15.5 (13.3–17.8)	19.7 (16.3–23.7)	11.6 (9.3–14.4)	<0.001
Barbados	2 (0–5)	3 (0–7)	2 (0–4)	<0.001	18.6 (16.6–20.7)	24.7 (21.5–28.2)	12.9 (10.7–15.5)	<0.001
Belize	2 (0–5)	3 (0–6)	2 (0–5)	0.001	21.2 (18.9–23.7)	24.6 (21.7–27.7)	18.0 (15.6–20.8)	<0.001
Bolivia	2 (1–4)	2 (1–5)	2 (1–4)	0.001	13.9 (12.6–15.3)	16.6 (14.7–18.7)	11.1 (9.5–13.0)	<0.001
British Virgin Islands	2 (0–5)	2 (0–6)	2 (0–4)	<0.001	17.3 (15.5–19.3)	22.4 (19.4–25.7)	12.9 (10.8–15.3)	<0.001
Cayman Islands	3 (1–5)	3 (1–6)	2 (0–4)	<0.001	14.0 (12.1–16.2)	17.8 (14.7–21.4)	10.3 (8.1–13.0)	<0.001
Chile	2 (1–5)	3 (1–5)	2 (1–4)	<0.001	13.6 (11.9–15.6)	18.3 (15.5–21.4)	9.3 (7.0–12.4)	<0.001
Colombia ^a	2 (1–4)	2 (1–5)	1 (0–4)	0.001	15.4 (13.1–18.0)	16.8 (13.9–20.1)	14.2 (10.8–18.6)	0.32
Costa Rica	2 (1–5)	3 (1–6)	2 (1–4)	<0.001	18.5 (16.5–20.6)	24.7 (22.5–27.1)	12.1 (9.7–15.0)	<0.001
Dominica	1 (0–4)	1 (0–4)	1 (0–4)	0.28	16.1 (13.9–18.5)	16.6 (13.2–20.7)	15.5 (12.9–18.6)	0.64
El Salvador	1 (0–4)	2 (0–5)	1 (0–3)	<0.001	13.0 (10.9–15.5)	16.1 (13.1–19.5)	9.7 (7.3–12.7)	0.003
Ecuador ^a	2 (1–4)	2 (1–5)	2 (1–3)	0.001	14.5 (13.3–15.7)	18.0 (16.3–19.8)	10.8 (8.6–13.4)	<0.001
Grenada	1 (0–4)	1 (0–4)	1 (0–3)	0.2	14.7 (12.6–17.1)	16.8 (13.5–20.8)	13.1 (10.8–15.8)	0.06
Guatemala	2 (1–4)	2 (1–5)	1 (1–3)	0.007	15.6 (13.0–18.5)	18.8 (16.2–21.6)	12.0 (8.6–16.4)	<0.001
Guyana	1 (0–4)	1 (0–4)	1 (0–3)	0.002	15.6 (12.7–19.1)	18.3 (13.7–23.9)	13.2 (10.4–16.7)	0.05
Honduras	1 (0–4)	2 (1–5)	1 (0–3)	<0.001	15.8 (13.8–18.0)	19.4 (16.9–22.2)	12.6 (9.9–15.8)	0.002
Montserrat	2 (0–5)	2 (0–5)	2 (1–5)	0.85	20.7 (15.5–27.2)	18.3 (11.6–27.6)	22.8 (15.5–32.3)	0.44
Peru	2 (1–5)	2 (1–5)	2 (1–4)	0.27	15.4 (13.7–17.2)	16.5 (14.2–19.2)	14.2 (12.5–16.2)	0.08
Saint Kitts and Nevis	2 (0–5)	2 (0–5)	1 (0–4)	<0.001	18.8 (16.8–20.9)	23.1 (20.0–26.5)	14.4 (12.2–16.9)	<0.001
Saint Lucia	2 (0–4)	2 (0–5)	1 (0–4)	0.07	15.4 (12.9–18.3)	16.8 (13.5–20.6)	14.3 (11.3–17.9)	0.23
Saint Vincent and Grenadines	1 (0–3)	1 (0–4)	1 (0–3)	<0.001	12.8 (10.7–15.2)	14.7 (11.9–18.1)	11.1 (8.5–14.4)	0.08
Suriname	2 (0–5)	2 (1–5)	2 (0–4)	<0.001	19.3 (16.6–22.4)	22.4 (18.5–26.7)	16.4 (14.1–19.0)	0.007
Trinidad and Tobago	2 (0–5)	3 (0–6)	2 (0–4)	<0.001	20.5 (17.5–23.9)	24.7 (21.2–28.5)	16.5 (13.9–19.6)	<0.001
Uruguay	2 (1–5)	4 (2–6)	2 (0–3)	<0.001	15.3 (13.7–17.1)	22.8 (20.4–25.3)	9.1 (7.8–10.7)	<0.001

Active day defined as engaging in moderate-to-vigorous physical activity for at least 60 min per day. Differences were adjusted by age and gender.

^aOnly regional representation.

was higher than 50% in half of the included countries, with most reporting higher prevalence of SB in girls than boys.

Only about 15% of adolescents in LAC countries were physically active, with most countries showing sex disparities. Therefore, the weighted overall prevalence of physical inactivity reported in this study was higher than the prevalence reported for this region (81.2%) in 2010.¹⁸ Gender inequality in PA levels remains an issue not only for this age group, but also for adults.¹⁹ As physical inactivity is affected through several levels of influence (i.e. individual, social and built environment, policy), to better understand this global issue, future monitoring strategies at national level should include those dimensions. International initiatives such as the Active Healthy Kids Global Alliance (AHKGA) have developed a matrix to compare countries from several regions in a number of indicators related to PA.^{20,21} The last AHKGA report showed that countries with high GII, such as some Latin American countries

(Brazil, Chile, Colombia, Mexico and Venezuela),^{22–26} tended to report worst grades in overall PA when compared with those with lower GII (The Netherlands, Slovenia and Denmark) at a global level.²⁰ Although it is difficult to explain a complex behaviour with one isolated index, in our study countries with high HDI, such as Chile and Argentina, were those with greater gender inequities in PA, as similarly shown by those with lower GII. These findings reflect the uneven distribution of these behaviours when considering these types of indices in LAC, especially when economic growth in the region has not always been accompanied by equality of wealth and opportunities (e.g. health or education access) within countries.^{27,28}

Overall, AT showed high variability across countries (ranging from 11.6% to 55.8%); only three countries reported a median number of 4 days per week and about a quarter showed differences by sex. Our findings suggest that AT in LAC countries would not be limited by vehicle availability or economic development, as there was no

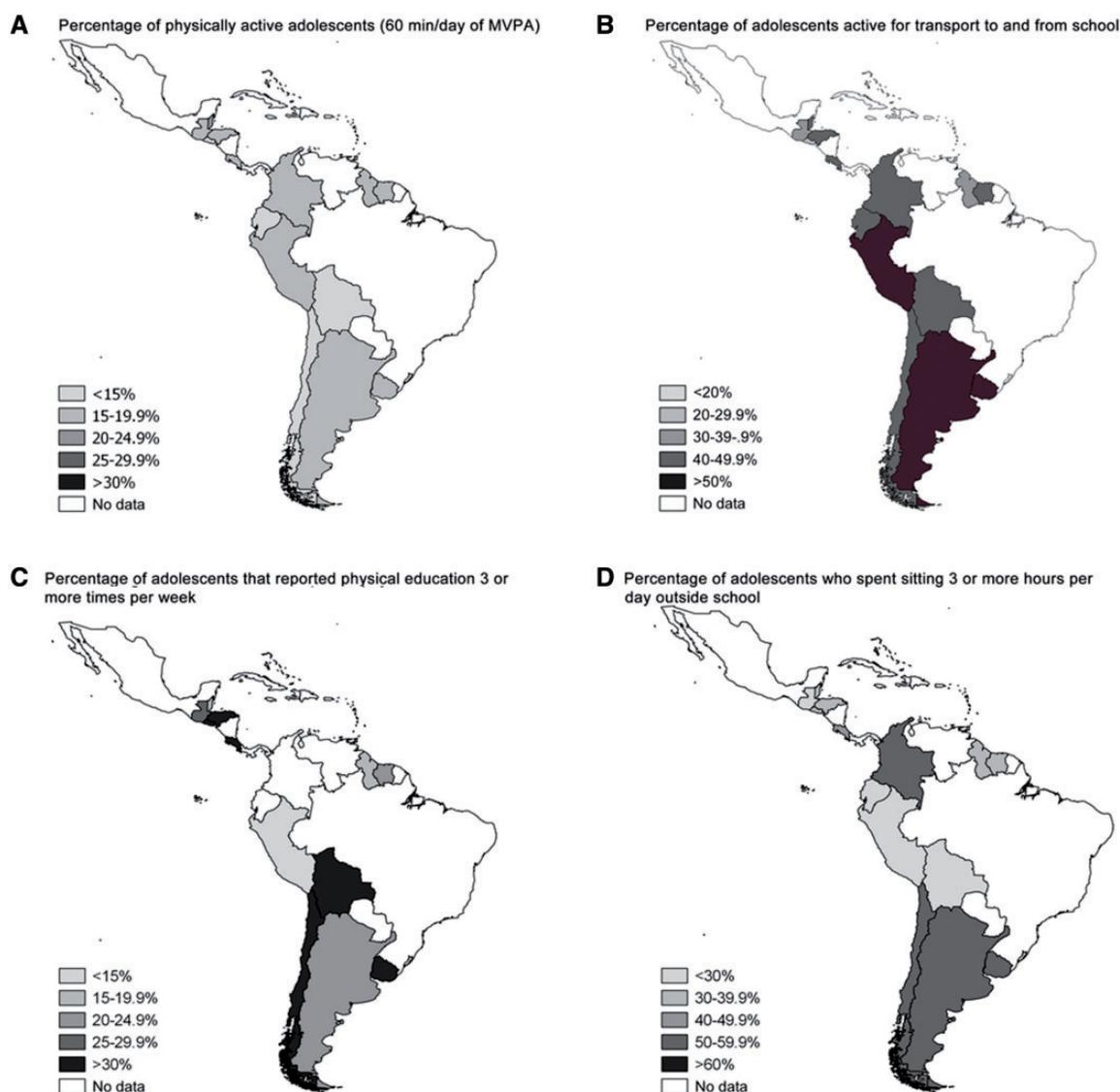


Figure 1. Regional distribution of adolescents physically active for at least 60 min per day (A), active for transportation to and from school at least 3 times per week (B), who reported 3 or more physical education classes per week (C), and who spent 3 or more hours sitting per day outside school hours (D) in Latin America.

clear pattern in the prevalence of AT or relative differences between sexes by MR or other indices. Regional differences may be explained by other factors, such as traffic policies (i.e. speed regulation), educational equity (i.e. access and facilities in schools) and urban planning (i.e. schools embedded in neighbourhoods), among others. AT is an important strategy not only for increasing PA in children, but also for promoting community connectedness and environmental safety.²⁹ The context in LAC countries requires a major coordination effort, as this behaviour is often limited by other factors such as perceived traffic, stranger danger or crime safety, which are commonly reported as barriers by parents.³⁰ Therefore, policy makers, authorities and other key actors should conceive multilevel interventions as interdisciplinary strategies (i.e.

coordination between transport, urban planning and education departments) for implementing successful programmes, as they have associated and convergent impacts in terms of individual health, traffic, pollution and safety, among others.

Overall, less than a third of adolescents from LAC countries reported having PE on 3 or more days per week. This is the first report of PE class participation in the GSHS, but results are in line with the findings of the 2013 Worldwide Survey of School Physical Education, which indicated that the allocated time for PE in schools from LAC countries (90 and 94 min/week at primary and secondary levels, respectively) was comparable to that allocated in African and Asian nations, but lower than in Europe, the USA and Oceania.³¹ PE is a fundamental

Table 3. Median (P25–P75) days per week that adolescents walked or rode a bicycle to and from school and percentage of adolescents active for transport in Latin America and the Caribbean

Country	Median active transport days per week (p25–p75)				Percentage of active transport to and from school (95% CI)			
	Overall	Male	Female	P	Overall	Male	Female	P
Antigua and Barbuda	0 (0-5)	0 (0-5)	0 (0-5)	0.14	35.0 (32.1-38.0)	32.7 (28.6-37.1)	37.5 (33.5-41.7)	0.072
Argentina	4 (0-7)	4 (0-7)	4 (0-7)	0.06	55.2 (52.5-57.9)	56.2 (52.9-59.4)	54.8 (51.5-57.3)	0.24
Bahamas	0 (0-2)	0 (0-2)	0 (0-2)	0.44	24.3 (21.9-26.8)	24.7 (21.1-28.7)	23.9 (20.8-27.4)	0.86
Barbados	0 (0-0)	0 (0-1)	0 (0-0)	0.01	16.0 (14.1-18.0)	17.3 (14.5-20.5)	14.7 (12.4-17.4)	0.202
Belize	2 (0-7)	3 (0-7)	2 (0-7)	0.04	49.5 (41.6-57.4)	50.9 (43.2-58.6)	48.2 (39.9-56.5)	0.036
Bolivia	2 (0-7)	2 (0-7)	2 (0-7)	0.1	47.6 (45.8-49.4)	45.8 (43.2-48.4)	49.4 (46.8-52.0)	0.042
British Virgin Islands	0 (0-3)	0 (0-3)	0 (0-3)	0.59	26.5 (24.4-28.8)	26.1 (22.9-29.6)	26.9 (24.0-30.0)	0.73
Cayman Islands	0 (0-0)	0 (0-0)	0 (0-0)	<0.001	11.6 (9.8-13.6)	14.1 (11.3-17.4)	9.2 (7.2-11.7)	0.010
Chile	2 (0-6)	2 (0-6)	2 (0-7)	0.93	48.0 (42.8-53.2)	47.0 (42.5-51.7)	48.9 (41.6-56.1)	0.56
Colombia ^a	1 (0-7)	0 (0-5)	1 (0-7)	0.02	41.5 (34.4-49.1)	36.8 (29.2-45.1)	45.5 (37.8-53.5)	0.003
Costa Rica	1 (0-7)	1 (0-7)	1 (0-7)	0.78	44.9 (39.3-50.0)	44.2 (38.7-49.9)	45.0 (38.8-51.3)	0.64
Dominica	1 (0-2)	1 (0-2)	1 (0-3)	0.16	24.5 (21.8-27.3)	23.2 (19.4-27.4)	25.8 (22.5-29.4)	0.276
El Salvador	1 (0-7)	1 (0-7)	1 (0-7)	0.87	45.9 (39.7-52.1)	44.9 (37.1-53.0)	46.9 (40.6-53.2)	0.57
Ecuador ^a	0 (0-2)	0 (0-2)	0 (0-2)	0.19	22.6 (19.7-25.8)	24.2 (21.4-27.2)	21.0 (17.1-25.4)	0.079
Grenada	0 (0-2)	0 (0-2)	0 (0-1)	0.04	20.6 (18.3-23.1)	20.4 (16.9-24.5)	20.8 (17.8-24.1)	0.92
Guatemala	1 (0-5)	1 (0-5)	1 (0-5)	0.19	38.9 (35.6-42.4)	40.7 (35.7-45.8)	37.0 (32.6-41.7)	0.289
Guyana	0 (0-4)	0 (0-5)	0 (0-3)	0.007	30.6 (25.7-36.0)	32.9 (27.3-39.1)	28.5 (23.1-34.6)	0.129
Honduras	2 (0-7)	2 (0-7)	1 (0-7)	0.13	47.1 (40.9-53.4)	49.8 (43.6-56.0)	44.7 (36.8-53.0)	0.198
Montserrat	0 (0-2)	0 (0-2)	0 (0-4)	0.74	24.2 (18.3-31.2)	21.8 (14.2-32.0)	26.2 (18.1-36.4)	0.661
Peru	4 (0-7)	3 (0-7)	5 (0-7)	0.03	54.7 (50.0-59.4)	51.5 (47.0-56.0)	58.0 (51.8-63.9)	0.015
Saint Kitts and Nevis	0 (0-5)	0 (0-5)	0 (0-5)	0.83	34.5 (32.1-37.0)	33.2 (29.6-37.0)	35.8 (32.6-39.1)	0.28
Saint Lucia	0 (0-0)	0 (0-1)	0 (0-0)	0.02	17.3 (14.9-20.1)	20.3 (16.8-24.3)	14.9 (11.8-18.5)	0.037
Saint Vincent and Grenadines	0 (0-3)	0 (0-2)	0 (0-3)	0.42	25.2 (22.0-28.7)	24.6 (20.5-29.3)	25.7 (21.3-30.6)	0.65
Suriname	1 (0-7)	1 (0-7)	1 (0-7)	0.56	45.8 (40.0-51.7)	45.6 (40.5-50.9)	46.0 (38.5-53.7)	0.826
Trinidad and Tobago	0 (0-2)	0 (0-2)	0 (0-1)	0.46	21.6 (18.2-25.5)	22.6 (19.1-26.5)	20.7 (15.8-26.7)	0.47
Uruguay	4 (0-7)	5 (0-7)	4 (0-7)	0.16	55.8 (50.5-61.1)	57.4 (51.7-62.9)	54.5 (48.6-60.3)	0.216

Active transport defined as walking or riding a bike at least 3 days during the past 7 days. Differences were adjusted by age and gender.

^aOnly regional representation.

opportunity for promoting PA, not only in school environments but also outside school. Although there is a global tendency in the reduction of time allocated for PE from 2000 to 2013,^{31,32} LAC countries have led the globe as they have increased minutes of PE per week by 17 min for primary and 7 min for secondary levels since 2007.³¹ LAC countries have also increased the percentage of prescribed national PE curricula from 67% in 2007 to 96% in 2013, increased implementation of PE in schools from 50% in 2000 to 89% in 2013 and decreased PE cancellations from 80% in 2000 to 52% in 2013.³¹ Although, LAC countries have shown positive changes for positioning PE in schools, there is a lot of space for improvement, as only about 10% met the minimum recommendation of 2 h per week.³¹ Therefore, the effects of the high level of implementation of PE policies on health indicators in LAC countries as reported by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in the past 5 years are still to be assessed.

About half of the included LAC countries in this study reported sitting 3 or more h per day outside school hours in more than 50% of the studied population. When contrasting our findings with the previous GSHS,¹² LAC countries are still lagging compared with other regions. To the best of our knowledge, the HDI has not been compared with SB in other age groups and countries. In our study, prevalences of SB in adolescents were highly correlated with the HDI by country, which may suggest that more developed countries tend to have greater access to more sedentary environments or attractions outside school hours. Also, countries with greater HDI were less unequal when SB by sex was compared. Lessons can be learnt from LAC countries with lower HDI, as SB may continue to rise as they develop, requiring comprehensive strategies for promoting an active life while reducing time spent in sedentary activities in this age group.

Despite regional representativeness being high, some large countries such as Brazil or Mexico were missing. Future monitoring strategies should make the effort to

Table 4. Percentage of adolescents who went to physical education classes on at least 3 and 5 or more days per week in Latin America and the Caribbean

Country	Percentage of PE class on 3 or more days each week (95% CI)			Percentage of PE class on 5 or more days each week (95% CI)			P
	Overall	Male	Female	Overall	Male	Female	
Antigua and Barbuda	26.4 (23.6-29.1)	27.4 (23.4-31.4)	25.2 (21.5-28.9)	21.1 (18.7-23.6)	21.6 (18.0-25.2)	20.7 (17.3-24.1)	0.73
Argentina	23.6 (22.4-24.8)	26.3 (24.4-28.2)	21.1 (19.6-22.6)	18.8 (17.6-19.9)	21.1 (19.3-22.9)	16.6 (15.2-18.0)	<0.001
Bahamas	19.8 (17.4-22.3)	22.2 (18.4-26.1)	17.7 (14.6-20.7)	13.9 (11.9-16.0)	16.2 (12.8-19.5)	11.9 (9.3-14.5)	0.05
Barbados	33.5 (30.8-36.2)	35.6 (31.6-40.0)	31.4 (27.8-35.0)	29.4 (26.7-32.0)	32.1 (28.2-36.1)	26.5 (23.1-30.0)	0.04
Belize	19.1 (15.4-23.4)	20.6 (16.7-25.1)	17.7 (13.6-22.8)	13.0 (11.4-14.6)	14.3 (10.8-18.7)	11.5 (9.4-14.0)	0.08
Bolivia	31.3 (29.2-33.4)	32.7 (29.6-35.7)	29.9 (27.0-32.8)	27.3 (25.3-29.3)	28.7 (26.0-31.5)	25.8 (22.9-28.7)	0.14
British Virgin Islands	24.5 (22.2-26.7)	25.9 (22.4-29.3)	23.2 (20.3-26.2)	21.6 (19.5-23.8)	23.2 (19.9-26.5)	20.2 (17.4-23.0)	0.734
Cayman Islands	-	-	-	-	-	-	-
Chile	33.0 (30.7-35.3)	32.6 (30.0-35.2)	33.4 (29.5-37.3)	28.3 (25.6-31.0)	28.4 (25.7-31.1)	28.2 (24.2-32.2)	0.92
Colombia ^a	-	-	-	-	-	-	-
Costa Rica	34.0 (29.8-38.4)	35.6 (31.0-40.4)	32.4 (27.8-37.4)	30.0 (26.5-33.8)	31.0 (26.9-35.3)	29.0 (25.1-33.3)	0.32
Dominica	23.9 (21.1-27.0)	24.2 (20.4-28.3)	23.7 (19.8-28.1)	18.9 (16.0-22.0)	18.6 (15.0-22.7)	19.1 (15.6-23.3)	0.82
El Salvador	37.8 (35.0-40.6)	39.2 (35.0-43.5)	36.3 (32.7-40.1)	34.4 (31.7-37.2)	35.1 (31.1-39.4)	33.6 (30.2-37.3)	0.58
Ecuador ^a	-	-	-	-	-	-	-
Grenada	-	-	-	-	-	-	-
Guatemala	29.0 (23.3-35.4)	31.1 (25.7-36.9)	26.6 (20.7-33.5)	22.7 (21.2-24.3)	24.6 (22.2-27.1)	20.6 (19.0-22.3)	0.004
Guyana	19.0 (16.1-22.3)	20.2 (17.4-23.4)	17.9 (14.3-22.2)	11.6 (9.8-13.8)	12.0 (9.7-14.8)	11.3 (9.4-13.5)	0.52
Honduras	30.5 (27.2-33.9)	33.4 (29.1-37.7)	28.0 (23.5-32.5)	26 (23.5-29.9)	28.5 (24.5-32.5)	25.0 (20.9-29.2)	0.18
Montserrat	-	-	-	-	-	-	-
Peru	2.2 (0.0-3.9)	2.4 (0.0-4.2)	1.9 (0.0-3.7)	1.5 (0.0-3.1)	1.7 (0.0-3.4)	1.4 (0.0-2.8)	0.49
Saint Kitts and Nevis	-	-	-	-	-	-	-
Saint Lucia	19.4 (17.4-21.4)	22.7 (19.5-25.8)	16.1 (13.7-18.5)	15.8 (14.0-17.7)	18.1 (15.2-20.9)	13.6 (11.4-15.8)	0.01
Saint Vincent and Grenadines	-	-	-	-	-	-	-
Suriname	21.1 (18.6-23.7)	22.4 (19.3-25.6)	19.9 (16.5-23.2)	15.8 (14.2-17.5)	16.7 (14.4-18.9)	15.0 (12.4-17.7)	0.35
Trinidad and Tobago	29.2 (25.6-33.1)	29.7 (24.8-35.0)	28.8 (25.0-32.9)	20.7 (18.8-22.7)	21.3 (17.5-25.6)	20.1 (18.4-22.0)	0.62
Uruguay	34.8 (32.1-37.6)	34.6 (31.5-37.8)	35.0 (32.0-38.2)	26.6 (24.8-28.6)	26.6 (24.0-29.5)	26.6 (24.7-28.6)	0.99

Differences were adjusted by age and gender.

^aOnly regional representation.

Table 5. Percentage of adolescents who spent 3 or more hours per day in sedentary behaviour outside school

Country	Percentage of 3 or more hours per day in SB (95% CI)			
	Overall	Male	Female	P
Antigua and Barbuda	54.9 (51.8-58.0)	50.7 (46.2-55.2)	59.4 (55.2-63.7)	0.006
Argentina	50.8 (49.4-52.1)	46.7 (44.7-48.8)	54.5 (52.7-56.4)	<0.001
Bahamas	54.5 (51.4-57.6)	49.4 (44.7-54.1)	59.0 (55.0-63.1)	0.003
Barbados	65.0 (62.2-67.7)	60.8 (56.7-64.8)	69.2 (65.6-72.9)	0.003
Belize	37.9 (34.1-41.9)	35.4 (31.4-39.5)	40.3 (35.2-45.6)	0.05
Bolivia	24.6 (21.8-27.4)	25.2 (21.7-28.7)	23.9 (20.5-27.3)	0.51
British Virgin Islands	61.7 (59.1-64.2)	57.7 (53.8-61.6)	65.2 (61.8-68.6)	0.005
Cayman Islands	56.9 (54.0-59.8)	52.2 (47.9-56.6)	61.4 (57.4-65.2)	0.002
Chile	54.0 (50.3-57.7)	50.1 (44.9-55.3)	57.7 (53.7-61.8)	0.02
Colombia ^a	51.8 (47.5-56.1)	50.9 (46.1-55.8)	52.5 (47.0-58.0)	0.59
Costa Rica	43.6 (40.2-47.1)	40.9 (37.4-44.5)	46.3 (42.2-50.4)	0.002
Dominica	–	–	–	–
El Salvador	34.5 (30.1-39.3)	32.1 (27.1-37.5)	37.1 (31.4-43.2)	0.11
Ecuador ^a	28.6 (26.1-31.2)	30.3 (26.0-35.0)	26.8 (24.0-29.8)	0.22
Grenada	40.9 (37.5-44.4)	40.7 (35.0-46.8)	41.0 (37.0-45.1)	0.94
Guatemala	24.2 (20.6-28.4)	24.2 (21.1-27.5)	24.4 (19.7-29.8)	0.90
Guyana	36.1 (31.6-40.8)	36.1 (31.8-40.7)	36.0 (30.8-41.6)	0.95
Honduras	30.2 (27.5-33.0)	29.8 (26.3-33.3)	30.6 (26.8-34.4)	0.72
Montserrat	50.7 (43.0-58.4)	50.5 (39.5-61.5)	50.8 (40.1-61.6)	0.97
Peru	28.8 (25.4-32.2)	28.8 (25.3-32.4)	28.8 (24.0-33.6)	0.99
Saint Kitts and Nevis	59.0 (56.4-61.5)	53.2 (49.4-57.1)	64.8 (61.6-68.0)	<0.001
Saint Lucia	53.7 (49.5-57.9)	55.7 (50.0-61.3)	52.1 (46.6-57.6)	0.33
Saint Vincent and Grenadines	39.1 (35.7-42.5)	41.4 (36.4-46.4)	37.1 (32.9-41.4)	0.17
Suriname	39.4 (35.4-43.3)	40.8 (36.7-44.9)	38.0 (33.4-42.6)	0.18
Trinidad and Tobago	43.8 (40.4-47.2)	40.0 (33.2-47.2)	47.5 (44.3-50.6)	0.07
Uruguay	59.0 (56.2-61.8)	56.1 (52.6-59.6)	61.4 (57.8-64.9)	0.02

Differences were adjusted by age and gender.

^aOnly regional representation.

include those countries, as well as others such as Paraguay, Jamaica or Panama, which do not often report PA in the scientific literature. Overall response rate was acceptable, as 19/26 LAC countries had at least a 75% response rate. However, some countries had much lower rates (e.g. Chile had 60%) with no report or further analysis about non-responders. Colombia and Ecuador had only sub-national representation (capital cities), which may affect interpretation of data when translating this to the national level. Although we used the latest available GSHS for each country, data ranged from 2007 to 2013. We acknowledge that this wide distribution in report dates may affect comparisons, as most countries are suffering rapid epidemiological and economic transitions with potential effects on lifestyles, including PA. Therefore, further studies using these samples may consider the comparison between datasets from the same years when available. Data collection was not designed to account for seasonal variability which may affect activity behaviours, exacerbating differences within and between countries,³³ especially considering variation

in opportunities and preferences for being physically active between sexes.^{34,35} Findings related to correlation analyses should be used with caution, as it is hard to identify causality with these methods and study designs. Also, the GII and GC were unavailable for most Caribbean countries, limiting extrapolation to that area of the region. Finally, no information about reliability and validity of the instrument or questions was provided for the included countries. However, a report from Fiji that used the same questionnaire showed kappa values ranging from 0.30 to 0.50 and percent agreement from 41% to 75%.³⁶ Comparison with objective tools may provide a different or complementary perspective to these findings.

Conclusion

The study sets a challenge for the LAC region, as physical inactivity and SB are highly prevalent across all countries. Gender inequities in PA and SB are shown in most countries. Therefore, specific strategies for engaging girls should

be adopted to assure equitable access to PA opportunities. Prevalences of physical inactivity and AT have not shown a clear pattern in terms of development. Thus, policy makers and intervention designers should consider exchanging experiences from other countries to adapt them to their own cultural values or customs, as some countries are advancing and leading in these matters. Current data have shown that less than a third of adolescents are participating in PE classes on 3 or more days per week in the region. Thus, the value of PA for developing not only better health but also social, cultural and economic benefits must be something that authorities should not forget in their government plans, especially when allocating budget proposals for stopping and reverting inequities related to this complex situation.

Supplementary Data

Supplementary data are available at *IJE* online.

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