Normative Reference of Standing Long Jump for Colombian Schoolchildren Aged 9–17.9 Years: The FUPRECOL Study

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Abstract

Ramírez-Vélez, R, Martínez, M, Correa-Bautista, JE, Lobelo, F, Izquierdo, M, Rodríguez-Rodríguez, F, and Cristi-Montero, C. Normative reference of standing long jump for Colombian schoolchildren aged 9-17.9 years: The FUPRECOL study. *J Strength Cond Res* 31(8): 2083–2090, 2017—The purpose of this study was to generate normative values for the standing long jump (SLJ) test in 9- to 17.9-year olds and to investigate sex and age-group differences. The sample comprised 8,034 healthy Colombian schoolchildren [boys n = 3,488 and girls n = 4,546; mean (SD) age 12.8 (±2.3) years old]. Each participant performed two SLJ. Centile smoothed curves, percentile, and tables for the third, 10th, 25th, 50th, 75th, 90th, and 97th percentiles were calculated using Cole's Lambda-Mu-Sigma method. The 2-way analysis of variance tests and Cohen's d showed that the maximum SLJ (centimeter) was higher in boys than in girls across age groups ($p < 0.01$), reaching the peak at 13 years. Posthoc analyses within the sexes showed yearly increases in SLJ in all ages. In boys, the 50th percentile SLJ score ranged from 109 to 165 cm. In girls, the 50th percentile jump ranged from 96 to 120 cm. For girls, jump scores increased yearly from age 9 to 12.9 years before reaching a plateau at an age between 13 and 15.9. Our results provide, for the first time, sex- and age-specific SLJ reference values for Colombian schoolchildren aged 9–17.9 years. The normative values presented in this study provide the basis for the determination of the proposed age- and sex-specific standards for the FUPRECOL (Association for Muscular Strength with Early Manifestation of Cardiovascular Disease Risk Factors Among Colombian Children and Adolescents) Study–Physical fitness battery for children and adolescents.

Key Words field assessment, lower body, muscle power, percentile, normative data

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31(8)/2083–2090

Journal of Strength and Conditioning Research

Introduction

Musculoskeletal fitness is a multidimensional construct comprising the integrated function of muscle endurance, muscle strength, and muscle power, which have an important association with markers of metabolic, bone, and cardiovascular health (16). There are several lower body explosive muscular strength/power tests, such as the countermovement jump, squat jump, vertical jump, Abalakov jump, and Sargent jump test (5,7,9); however, among these tests, standing long jump (SLJ) is considered the most valid and reliable field-based muscular fitness test in children and adolescents (3,7,23), even when it is compared with isokinetic strength exercises (3).

Standing long jump is a power test that incorporates 1 or a couple of maximal efforts at a submaximal velocity and load, which depend more on a high degree of neuromechanical coordination than biochemical endurance capacities (16), being widely included in diverse fitness test batteries in schoolchildren (5,7,16,20,27). This test is strongly associated to both upper and lower muscular strength in youth (7,3), and in turn, high muscle strength has been related to an improvement in the metabolic risk factor in children (11) and mortality (31).

From a public health perspective, the inclusion of SLJ in health surveillance systems could be clearly justifiable, and schools may be an ideal setting for monitoring youth fitness to identify those with poor strength (23). However, anthropometric characteristics (15), genetic (22) and racial/ethnic differences (1,2), sex (10,28,29), chronological age, and biological maturation (18) are several

TABLE 1. Descriptive statistics for anthropometric and standing long jump in 9–17.9–year olds in Colombian Schoolchildren.*†‡

Sex	*n*	Tanner stage (I to V %)	Body mass (kg)	Height (cm)	BMI (kg/m²)	SLJ (cm)	Difference *D* (cm)	Difference %	Difference Cohen's *d*
Boys									
9 to 9.9	253	24/59/13/3/2	32.1 (7.5)	133.5 (6.5)	17.8 (3.1)	107.9 (24.2)§‖	Reference		
10 to 10.9	453	14/61/18/7/0	34.5 (8.5)	137.3 (7.4)¶	18.1 (3.3)	117.6 (22.5)§‖	9.7	9.0	0.40
11 to 11.9	436	5/65/21/7/1	37.2 (8.8)¶	141.9 (8.2)¶	18.3 (3.2)	121.1 (25.6)§‖	3.5	3.0	0.16
12 to 12.9	407	4/43/43/9/1	41.3 (9.1)¶	147.1 (8.2)¶	18.9 (3.2)	126.5 (26.7)§‖	5.4	4.5	0.21
13 to 13.9	411	2/22/46/27/3	46.0 (9.8)¶	153.5 (9.3)¶	19.4 (3.3)§	140.2 (30.7)§‖	13.7	10.8	0.51
14 to 14.9	454	1/11/37/41/10	50.0 (9.7)¶	158.9 (9.1)§	19.7 (3.0)§	144.3 (35.2)§‖	4.1	2.9	0.13
15 to 15.9	432	1/5/32/49/13	54.4 (9.7)¶	163.3 (8.9)§	20.3 (3.0)§	154.0 (36.8)§‖	9.7	6.7	0.28
16 to 16.9	378	0/4/21/57/18	57.7 (8.7)§	166.7 (7.2)§	20.8 (2.9)§	156.4 (41.5)§‖	2.4	1.6	0.07
17 to 17.9	264	1/3/18/53/25	60.8 (10.3)§	168.1 (7.4)§	21.5 (3.3)§	161.1 (41.4)§‖	4.7	9.0	0.11
Total	3488	5/30/29/28/8	45.5 (13.0)¶	151.9 (14.1)§	19.4 (3.3)§	139.2 (31.1)§			
Girls									
9 to 9.9	325	36/40/21/3/0	32.1 (7.4)	134.6 (7.6)	17.6 (3.0)	94.9 (22.2)‖	Reference		
10 to 10.9	690	24/46/25/4/1	35.0 (7.9)	138.4 (7.6)	18.1 (3.0)	100.9 (22.5)‖	6	6.3	0.27
11 to 11.9	638	13/39/37/10/1	38.3 (7.9)	143.7 (7.5)	18.4 (2.9)	107.1 (20.3)‖	6.2	6.1	0.28
12 to 12.9	538	6/27/44/22/1	42.8 (8.6)	148.5 (7.3)	19.3 (3.0)	109.4 (22.2)‖	2.3	2.1	0.11
13 to 13.9	478	2/15/44/37/2	47.4 (9.0)	152.4 (6.3)	20.3 (3.2)	113.1 (24.4)‖	3.7	3.4	0.17
14 to 14.9	608	1/6/40/46/7	51.0 (8.9)	154.6 (6.5)	21.3 (3.3)	113.0 (26.6)	−0.1	−0.1	0.00
15 to 15.9	518	1/5/25/56/12	52.7 (8.6)	155.7 (6.8)	21.7 (3.1)	112.8 (29.4)	−0.2	−0.2	−0.01
16 to 16.9	446	0/3/17/65/16	53.9 (8.6)	156.4 (5.8)	22.0 (3.1)	115.4 (29.0)‖	2.6	2.3	0.09
17 to 17.9	305	0/2/18/61/18	55.1 (9.3)	156.8 (6.5)	22.4 (3.6)	117.5 (35.1)‖	2.1	1.8	0.07
Total	4546	9/22/32/32/6	44.8 (11.5)	148.7 (10.1)	20.0 (3.5)	111.0 (22.2)			

*BMI = body mass index; SLJ = standing long jump.
†Data values are reported as mean (±) *SD* or frequencies (%). *D* = between-year differences in both absolute (centimeter) and relative change in SLJ (%). The 9–9.9 age-group was considered as a reference.
‡Cohen's *d*: Standardized mean difference between a target group and the preceding age-sex–matched group.
§$p < 0.0001$, significant difference between boys and girls within the same age-group.
‖Standing long jump significantly higher ($p \leq 0.05$) than for the preceding age-group.
¶$p < 0.01$, significant difference between boys and girls within the same age-group.

variables that can modulate differences in muscular strength in youth (17).

Because of this, several normative data regarding SLJ for children and adolescents have been generated in different parts of the world (8,10,20,28,29); however, most of these studies both come from high income countries (8,20,21,27) or have not been applied in Latin American population (6,7,10,27). For practical issues, it would be of interest both in public health and implementation of strength training programs. The first, for comparisons among the same health-related fitness scores of children and adolescents similar to Colombia (i.e., culture, ethnic/race, etc.), and to generate preventive strategies to improve their musculoskeletal health. The second, SLJ is an easily administered test, which is very useful to measure and control the effectiveness of lower body muscular training through a low in cost and equipment requirements.

Therefore, the aims of this study were to generate normative SLJ scores for 9- to 17.9-year olds and to investigate differences between sex and age groups in a large sample of Colombian schoolchildren.

Methods

Experimental Approach to the Problem

During the 2014–2015 school year, we conducted a cross-sectional study, a component of the FUPRECOL project (Association for Muscular Strength with Early Manifestation of Cardiovascular Disease Risk Factors Among Colombian Children and Adolescents). Briefly, this study aimed to examine the relationships between physical fitness levels in children and adolescents with cardiometabolic risk factors and unhealthy habits. These data were used to evaluate health status and to establish reference values for anthropometric, metabolic, and physical fitness among children and adolescents, aged 9–17.9 years, from Bogota, Colombia (23,25).

Subjects

The sample comprised 8,034 healthy Colombian schoolchildren (boys $n = 3,488$ and girls $n = 4,546$; mean ± *SD* age 12.8 ± 2.3; weight 45.1 ± 12.1 kg; height 1.50 ± 0.1 m; and body mass index [BMI] 19.7 ± 3.4 kg/m^2). A total of 10,000 students were considered for physical fitness evaluation from the capital district of Bogota. Erroneous data entry ($n = 893$), student disability ($n = 342$), student temporary illness or injury ($n = 187$), student chronic illness ($n = 256$), or absenteeism ($n = 288$) limited the analytical sample to 8,034 students. The schoolchildren were of low-middle socioeconomic status (SES 1–3, as defined by the Colombian Government) and were enrolled in public elementary and high schools (grades 5 through 11) in the capital district of Bogota in a municipality of the Cundinamarca Department in the Andean region. Notably, this region is located approximately 2,625 meters (min: 2,500, max: 3,250) above sea level.

A sample of volunteers were included and grouped by sex and age with 1-year increments (a total of 9 groups). The sample size was estimated to be approximately 200–400 participants per group. Exclusion factors ($n = 785$) included clinical diagnosis of cardiovascular disease, diabetes mellitus 1 or 2, pregnancy, the use of alcohol or drugs, and, in general, the presence of any disease not directly associated with nutrition or problems with the muscles, joints, and bones. Exclusion from the study

Table 2. Standing long jump (centimeter) percentiles in boys and girls by age.*

	n	M	*SD*	P_3	P_{10}	P_{25}	P_{50}	P_{75}	P_{90}	P_{97}
Boys										
9 to 9.9	253	107	24	65	83	97	109	121	134	146
10 to 10.9	453	117	22	79	91	102	118	132	145	157
11 to 11.9	436	121	25	75	93	107	123	137	151	160
12 to 12.9	407	126	26	78	99	112	126	143	157	170
13 to 13.9	411	140	30	82	108	124	139	160	175	196
14 to 14.9	454	144	35	67	107	129	148	165	178	201
15 to 15.9	432	154	36	85	117	136	158	178	192	209
16 to 16.9	378	156	41	0	117	139	163	181	197	214
17 to 17.9	264	161	41	0	118	145	165	185	206	216
Total	3,488	139	31	86	101	116	136	160	181	201
Girls										
9 to 9.9	325	94	22	56	71	83	96	107	121	135
10 to 10.9	690	100	22	60	74	87	102	115	128	141
11 to 11.9	638	107	20	71	83	95	107	119	131	143
12 to 12.9	538	109	22	70	83	96	110	123	136	146
13 to 13.9	478	113	24	69	87	99	114	128	139	153
14 to 14.9	608	113	26	63	84	100	115	128	141	157
15 to 15.9	518	112	29	12	86	99	115	129	143	159
16 to 16.9	446	115	29	24	90	104	117	130	145	156
17 to 17.9	305	117	35	0	90	105	120	138	153	171
Total	4,546	111	22	70	83	96	110	125	139.1	152

*M = mean; P = percentile.

was made effective a posteriori, without the students being aware of their exclusion, to avoid any undesired situations.

The Review Committee for Research on Human Subjects at the University of Rosario [Code Nº CEI-ABN026-000262] approved all study procedures. A comprehensive verbal description of the nature and purpose of the study and its experimental risks were provided to the participants and their parents or guardians. This information was also sent to parents or guardians by regular mail, and written informed consent was obtained from the parents and subjects before participation in the study. The protocol was in accordance with the latest revision of the Declaration of Helsinki and current Colombian laws governing clinical research on human subjects (Resolution 008430/1993 Ministry of health).

Procedures

Anthropometrics variables were measured by a level 2 anthropometrist certified by the International Society for the Advancement of Kinanthropometry (ISAK), in accordance with the ISAK guidelines (19), in the morning (7:00–10:00 AM) after an overnight fast. Body weight was measured with the subjects in their underwear and with no shoes, using electronic scales (Tanita BC544; Tokyo, Japan) with a low technical error of measurement (technical error of measurement = 0.510%). Height was measured using a mechanical stadiometer platform (Seca 274; Hamburg, Germany; technical error of measurement = 0.019%). Body mass index was calculated as the body weight in kilogram divided by the square of height in meters. The data were recorded on paper by FUPRECOL evaluators (23). Sexual maturation was classified based on Tanner staging, which uses self-reported puberty status to classify participants into stages I to V (30). Each volunteer entered an isolated room where they categorized the development of their own genitalia (for boys), breasts (for girls), armpits (for boys), and pubic hair (for both sexes) using a set of images exemplifying the various stages of sexual maturation. The reproducibility of our data reached $r = 0.78$. The data were recorded on paper by the FUPRECOL evaluators.

To measure SLJ, each participant began in a standing position, with both feet touching a starting line. Subjects were allowed to swing their arms before the jump. Two jumps were performed with 1 minute allowed for recovery between attempts, and the average score was recorded as the peak SLJ (centimeter). The distance is measured from the take-off line to the point where the back of the heel nearest to the take-off line lands on the mat or the nonslippery floor

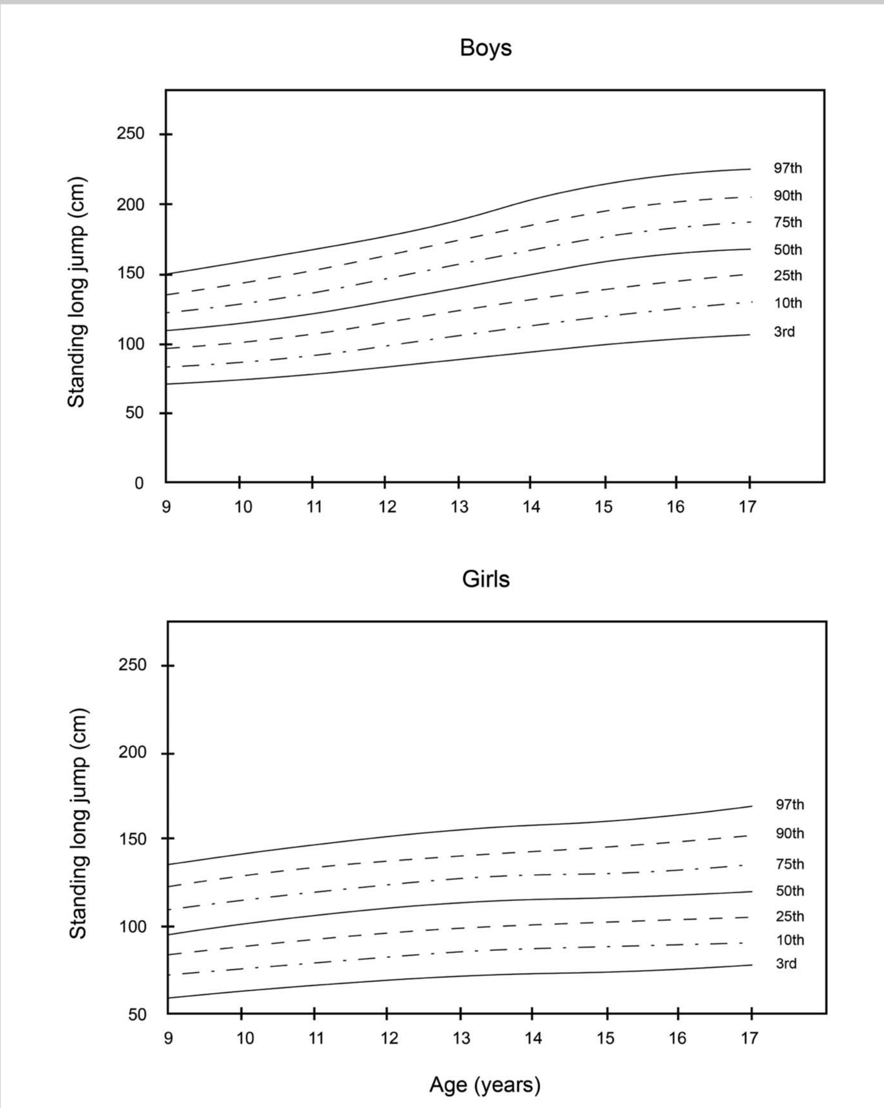

Figure 1. Centile curves for standing long jump (centimeter) in boys and girls by age.

(28). A nonslip hard surface, chalk, and a tape measure were used to perform the test. Previously, both during physical education classes and until 1 day before the SLJ test, each child could practice how many times wanted to prevent as far as possible the learning effect (23). All personnel were trained in testing and calibration procedures, and a calibration log was maintained. Standing long jump measurements in a subsample (n = 229, median age = 12.8 ± 2.4 years, weight = 46.2 ± 12.4 kg, height = 1.50 ± 0.1 m, and BMI = 19.9 ± 3.1 kg/m^2) were recorded to ensure reproducibility on the day of the study. The reproducibility of our data was r = 0.85. Intrarater reliability was assessed by determining the intraclass correlation coefficient (ICC = 0.92, confidence interval 95% 0.89–0.93).

Statistical Analyses

Anthropometric characteristics and SLJ from the study sample are presented as the mean with SD. Normality for selected variables was verified using histograms and Q-Q plots. Data were then split by sex and a 2-way analysis of variance (ANOVA) with posthoc tests (Tukey) used to identify differences between age groups within sexes. The Cole's Lambda-Mu-Sigma (LMS) method assumes that the outcome variable has a normal distribution after a Box-Cox power transformation is applied (12), using the LMS method implemented in the LMSChartMaker Pro Version 2.54, (Medical Research Council, London, UK, http://www.healthforallchildren.com/shop-base/software/lmschartmaker-light/). Smoothed and specific curves for each age were obtained through a penalized maximum likelihood with the following abbreviations: (a) M (median), (b) L (Box-Cox transformation), and (c) S (coefficient of variation) (12). The appropriate number of degrees of freedom was selected on the basis of the deviance, Q-tests, and worm plots, following the suggestions of Royston and Wright (26). The third, 10th, 25th, 50th, 75th, 90th, and 97th smoothing centiles were chosen as age- and sex-specific reference values. Effect size (ES) was calculated through the standardized mean difference (Cohen's d) and interpreted as follows: trivial <0.5; small 0.5–1.25; moderate 1.25–1.9; and large effect >2.0, considering the recommendation in strength training research (24). We used SPSS V. 21.0 software for Windows (SPSS, Chicago, IL, USA) for everything but the LMS method calculations. Statistical significance was set at $p \leq 0.05$.

Results

Descriptive Characteristics

Descriptive statistics for each sex are shown in Table 1. All anthropometric variables, except the BMI (aged 9–12.9 years), were higher in boys that than in girls ($p < 0.01$). The 2-way ANOVA tests showed that the maximum jump scores (centimeter) were higher in boys than that in girls ($p < 0.01$). Posthoc analyses within sexes showed yearly increases in SLJ scores in all ages.

Standing long jump score smoothed LMS curves (third, 10th, 25th, 50th, 75th, 90th, and 97th percentiles) for boys

Table 3. Reference values (50th percentile) for standing long jump (centimeter) from cited studies.

Sex and age	FUPRECOL n = 8,034	EU* n = 3,528	Australians n = 11,194	Hungarian n = 2,427	Greek n = 424,328	Chinese n = 12,712
Boys						
9 to 9.9	109	–	138	–	131	142
10 to 10.9	118	–	143	–	140	142
11 to 11.9	123	–	149	147	147	150
12 to 12.9	126	–	156	162	154	154
13 to 13.9	139	159	166	175	164	160
14 to 14.9	148	176	178	186	175	165
15 to 15.9	158	189	189	195	183	174
16 to 16.9	163	199	–	202	188	181
17 to 17.9	165	208	–	207	188	188
Girls						
9 to 9.9	96	–	126	–	120	120
10 to 10.9	102	–	133	–	127	127
11 to 11.9	107	–	140	140	134	125
12 to 12.9	110	–	145	143	136	123
13 to 13.9	114	140	150	147	137	122
14 to 14.9	115	144	154	150	135	124
15 to 15.9	115	145	156	152	134	140
16 to 16.9	117	147	–	153	132	124
17 to 17.9	120	150	–	154	133	127

*The European Union from 10 European cities in Austria, Belgium, France, Germany, Greece (an inland city and an island city), Hungary, Italy, Spain, and Sweden.

and girls are shown in Figure 1. The equivalent numerical values are shown in Table 2. Together, these data show that boys performed better on the test at all ages compared with girls. Regarding the boys, the SLJ score 50th percentile ranged from 109.3 to 165.8 cm. In girls, the 50th percentile jump scores ranged from 96.0 to 120.0 cm. For girls, the jump scores increased yearly, from 9 to 12.9 years olds, before reaching a plateau at 13–16.9 years olds.

Finally, comparisons between the 50th percentile values for SLJ scores (centimeter) from this study and other studies are presented in Table 3. We found studies in adolescents from Australia, the European Union, Hungary, Hong Kong, and Greece.

Discussion

To our knowledge, this is the first study to generate normative values of SLJ scores, and the first to investigate the differences between sex and age groups, in a large sample of Latin American children and adolescents from 9- to 17.9-year olds. Although other studies have generated normative SLJ values for their populations such as Austria, Belgium, France, Germany, Greece, Hungary, Italy, Spain, Chinese, and Sweden (8,10,20,28,29), it is a well known fact that racial/ethnic differences in anthropometric and genetic factors could affect the muscle strength and jump performance (1,10,15,22). For example, a study from Saint-Maurice et al. (28) found similar results regarding SLJ with both the HELENA Study (20) and a study applied in Australian children (8); however, the Hungarian normative scores tend to be slightly higher than those in these 2 studies. By providing centile curves for SLJ, it is now possible to identify Colombian children and adolescents with low or high SLJ with respect to their age and sex. Most current studies support an inverse association between muscular fitness and cardiovascular disease risk factors in youth, generally expressing muscular strength in relative terms (11,31). Therefore, specific normative values (by sex and age) are necessary for trainers, health professionals, and physical education teachers to evaluate children's and adolescents' SLJ from Latin America.

In general, Table 3 shows that Colombian children and adolescents achieved lower values than their peers from other countries. When comparing the 13–15.9–year-old boys (5 studies present all values for this range of ages), differences of 17.8, 19.8, 24.9, 17.3, and 12.1% were observed in comparison with boys from the European Union, Australia, Hungary, Greece, and China, respectively (8,10,20,28,29). Notably, similar results were found to occur in girls. More studies are necessary in this area to acquire information justifying such differences, but we believe that height and body composition could play an important role (15).

As part of this approach, Hraski et al. (2015) studied kinematic parameters and morphological characteristics relevant to SLJ performance and found that children who were taller (i.e., longer arms and legs) and leaner (body fat percentage) achieved better results (15). Linear regression analyses showed correlations between SLJ's and anthropometrics' variables by age-group in both sexes and age groups (data not shown). In boys, we also found moderate correlation between height and SLJ ($r = 0.613$, $p < 0.001$), and weak correlation between body mass and SLJ ($r = 0.437$, $p < 0.001$). In girls, we also found weak correlation between height and SLJ ($r = 0.316$, $p < 0.001$), and body mass and SLJ ($r = 0.168$, $p < 0.001$). Latin American populations are shorter than Non-Hispanic whites and Non-Hispanic blacks (13), and although Colombia has one of the lowest overweight and obesity rates in the region, these rates have increased abruptly during the last 10 years (14). Our findings reinforce the importance of generating normative SLJ values for specific populations and is the most significant contribution of this study.

In particular, results demonstrated that SLJ performance differ significantly between boys and girls ($p < 0.0001$). Boys' SLJ increases progressively from 9- to 17.9-year olds, achieving at the age of 13 the greatest differences (ES: small; 13.7 cm equivalent to 10.8% respect to the preceding age-group). In the case of girls, SLJ increase progressively until the age of 17.9, but from 13 to 15.9 years, they present a plateau in SLJ (all ES were interpreted as trivial). Despite the statistical difference, sex differences in SLJ variation were small when the children were aged 9–11.9 years. These results are similar to other normative previously published references (10,28,29), but the SLJ peak in Australian seems to occur before than in Colombian children (8).

In that regard, SLJ differences between sex and countries could be mainly because of biological (3,10,18) and environmental factors (1,2), respectively. State of maturity may be the most important biological factor that affects SLJ performance and might account for intercountry differences. Rapid growth in long bones relative to muscle lengthening has been related to structure, neuromuscular function, and physical performance disruptions (17,18). Hormonal influence during puberty, such as steroid hormones and growth hormones, can generate important variations in bone mineral content, muscle mass, strength, and fat mass between boys and girls (10,17). Furthermore, children with a more mature neuromuscular system may have an advantage (4).

On the other, growth patterns of children and the state of maturity, even of a common geographic background, are affected by educational status, socioeconomic level, life habits, and diet (2). Then, if different populations mature at different rates, these mentioned factors could explain our differences in age-related comparisons respect with the more economically developed countries. However, there is a scarcity of reference values for children using harmonized measures of fitness in Latin America and other low-middle income countries undergoing nutritional transitions, making it impossible to evaluate secular trends within these regions (23).

This study had some limitations. First, this study includes participants from only a single region in Colombia.

However, Bogota is the largest urban center in Colombia comprising about 15% of the country's population. It includes a mix of locally born residents and populations from other regions of the country who relocate there with large racial and cultural diversity.

Second, we have not considered the potential impact of recognized determinants to muscle strength such as height on the centile values presented. However, because our study is cross -sectional, a cohort effect may have occurred, and as a consequence, our estimations of muscle strength levels could not be extrapolated from previous cohorts.

Third limitation is that this study did not include assessments of students attending private schools. This is because the study was deployed in collaboration with the Bogota District Education Department, which only has jurisdiction among public schools. However, the public system constitutes most school offering in the city, with 85% of school-age children enrolled in the city public school system. Therefore, and considering the above-mentioned points, inferences to all Bogota or Colombian children and adolescents should be made cautiously. This is an area for future research. However, such limitations do not compromise the results obtained when validating our results.

Finally, this study also has strengths that should be highlighted. These results are the first percentile values ever obtained for SLJ in Colombian children and adolescents (aged 9- 17.9 years). Taking advantage of a newly compiled and large population-based sample, this study develops centile references for Colombian schoolchildren using the popular percentile method. This provided an accurate description of the muscle strength characteristics of the population studied and their age-related and sex-related variations.

Practical Applications

The reference percentiles can be used as a reference with which to compare the muscular fitness of individuals of a corresponding age in the city, region, and country. Establishing these reference percentiles allows for comparison of muscular strength in schoolchildren, who vary geographically and demographically, with others in similar settings. In this line, the SLJ test is a safe, practical, time-efficient, and low-cost test that has a strong relationship with global body strength; however, the most of the SLJ's normative reference have been published on Caucasian populations. The main findings of this study have shown a significant difference between sexes. Boys reach the SLJ peak during puberty, whereas a plateau is evident in girls between 13–15.9–year olds. Therefore, this work meets a need and provides an important information for trainers, physical education teachers, and health professionals to evaluate SLJ test from early ages in Latin American children and adolescents. Simultaneously, this study allows for more accurate categorization, which considers a child's age and sex, and enables comparisons among normative values from other countries.

Acknowledgments

This article manuscript contains material that is original and not previously published in text or on the Internet, nor is it being considered elsewhere until a decision is made as to its acceptability by the Journal of Strength and Conditioning Research Editorial Review Board. The authors disclose funding received for this work from any of the following organizations: National Institutes of Health (NIH); Wellcome Trust; Howard Hughes Medical Institute (HHMI); and others.

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