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Three in Every 10 School-aged Children in Brazil Report Back Pain in Any Given Year: 12-Month Prospective Cohort Study of Prevalence, Incidence, and Prognosis

OBJECTIVE: To estimate the prevalence, incidence, and prognosis of back pain in children and adolescents.

DESIGN: Prospective cohort study.

METHODS: We followed children and adolescents between the ages of 8 and 18 years with and without back pain over 12 months (3, 6, and 12 months) from public and private schools. At baseline, parents (or guardians) answered questionnaires including sociodemographic characteristics and perception of sleep quality of their children and adolescents. Children and adolescents answered questionnaires including sociodemographic characteristics, presence of back pain, pain intensity, quality of life, and psychosomatic symptoms. At follow-up, children and adolescents answered questions about the presence of back pain.

RESULTS: Six hundred fifteen children and adolescents were included, 163 of whom had back pain and 452 of whom had no back pain at baseline. The mean age of participants was 11.6 years (SD = 2.5), and the majority were female (n = 362; 59%). The 1-month prevalence of back pain was 26% (95% confidence interval: 23%-30%). The incidence rate of back pain was 35% (31%-40%) over 12 months. Of the 163 participants who had back pain at baseline, 83% had recovered by 12 months. Of those who recovered within 6 months, 31% had a recurrence of back pain at the 12-month follow-up.

CONCLUSION: Two to 3 in every 10 children and adolescents reported back pain in the last month. New cases of back pain were reported by 3-4 in every 10 children and adolescents for a period of 12 months. Nearly all children recover within 12 months, but recurrence seems to be common. *J Orthop Sports Phys Ther 2022;52(8):554-562. Epub: 19 June 2022. doi:10.2519/jospt.2022.10819*

KEY WORDS: *back pain, children and adolescents, musculoskeletal pain, prevalence, incidence, prognosis*

Back pain is highly prevalent and has a high burden in all age groups.[9,20,26] Back pain in children and adolescents can impact daily activities, school attendance, and physical activities, and it can precipitate medication use and medical consultations.[29] For children and adolescents, the prevalence of back pain increases with age, and by the end of adolescence, it is comparable to adult prevalence.[20] A 2018 cross-sectional study reported a 12-month low back pain prevalence of 12% in girls aged 9-14 years old and of 28% in 15-19 year-olds.[22] Data on incidence and prognosis are more limited. A 2-year cohort study with 1300 Danish children aged 11-13 years old found an incidence of 42%.[1] Regarding prognosis, 26% of British children and adolescents experienced persistent low back pain after 4 years.[17]

Children and adolescents express pain in different ways.[25,33] Parents and professionals can underestimate these signs.[12,25] Taller height, regular exercise, older age, use of electronic devices, poor sleep quality, poor quality of life, perception of a heavy backpack, and psychosomatic symptoms are associated with musculoskeletal pain in children and adolescents.[2,14,22,34,45] Psychosomatic symptoms (mental and physical signs that arise or are influenced by mind and emotions, instead of a specific pathoanatomical cause[11]) have the strongest association with musculoskeletal pain.[14]

Epidemiological estimates from high-income countries may not generalize well to middle-income and low-income countries. Back pain in children and adolescents appears to be more prevalent and

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have a higher burden in low-income and middle-income countries.[9] Brazil has the highest years lived with disability for musculoskeletal disorders, including back pain, in children and adolescents aged 5-14 years.[9] There are few studies of back pain in children and adolescents conducted in middle-income or low-income countries, and there are no longitudinal studies.[4,10,36]

The aim of this study was to (1) estimate the prevalence, incidence, and prognosis of back pain in children and adolescents in São Paulo state, Brazil; (2) compare the baseline characteristics of children and adolescents who self-reported back pain with those who do not; and (3) compare back pain reports from children and adolescents with their parents/guardians' reports.

METHODS

Study Design and Setting

We conducted a prospective cohort study with a follow-up period of 12 months. All data were collected in public and private schools in São Paulo state, Brazil. This study was approved by the Ethics and Research Committee at the Universidade Cidade de São Paulo. All participant rights were protected. Data were collected between November 2019 and December 2020.

Procedures

Children and adolescents aged between 8 and 18 years and their parents/guardians were invited to participate. We invited students attending schools from 3 cities (São Paulo, Salto, and Itu). We first contacted the prefectures of the city in which the school was located to ask for permission to approach public schools. After approval, the principal of each school (identified via random selection) was contacted and invited. After a formal approval, we started the data collection. Schools provided the total number and information regarding name and age of students to the research team. Parents/guardians received a package with information about the study, consent form, sociodemographic questionnaire, sleep quality questionnaire, and a questionnaire investigating the presence of back pain experienced by their child. All materials were to be returned to the school within 1 week. Children and adolescents received an assent form and questionnaires about sociodemographics, presence of back pain, pain intensity, psychosomatic symptoms, and quality of life. Children and adolescents answered all baseline questionnaires at school, in the classroom, supervised by their teachers, to avoid interference by parents/guardians. During the follow-up period, we contacted children and adolescents by telephone or online survey sent by text message or e-mail, according to their preference. Data collection timepoints were 3, 6 and 12 months after baseline.

Participants

We prospectively followed 615 children and adolescents aged between 8 and 18 years, with or without back pain. The minimum age of 8 years was chosen because this age generally corresponds with sufficient cognitive and linguistic development to self-report symptoms.[3] Children and adolescents were classified as having back pain if they answered "yes" to question 1 (Did you feel some pain in back, neck, arms (including hands) or legs (including feet) in the last month?) and if they choose specifically the region "back" in question 2 of the Presence and Impact of Pain in Kids (PIP-Kids) (**SUPPLEMENTAL FILE 1**). The items were used in previous research.[29] Children and adolescents with pain due to surgery or any specific pathology (eg, cancer, infection, and fracture) were not included in this study.

Outcome Measurement

We had 3 main outcomes as follows: (1) presence of back pain at baseline (prevalence); (2) recovery from back pain in those who reported back pain at baseline (prognosis); and (3) development of back pain in those pain-free at baseline (incidence). During the follow-up period, we collected data regarding presence of back pain.[29] Recovery from back pain was defined as when children and adolescents answered "no" to question 1 in the questionnaire (Did you feel some pain in back, neck, arms (including hands), or legs (including feet) in the last month?) or if they answered "yes", but did not choose "back" for their region of pain.

Development of a new case of back pain (incidence) was defined as when children and adolescent answered "yes" to question 1 in the questionnaire regarding presence and impact of pain (Did you feel some pain in back, neck, arms (including hands), or legs (including feet) in the last month?) and if they choose "back" for their region of pain at 1 of the follow-up timepoints.[29] We considered recurrence of back pain when a child or adolescent answered "yes" for question 1 in the questionnaire regarding presence and impact of pain (Did you feel some pain in back, neck, arms (including hands), or legs (including feet) in the last month?) and if they choose "back" for their region of pain, after answering "no" for question 1 (no back pain) at any timepoint.

We collected sociodemographic characteristics, back pain chronicity,[29] back pain impact,[29] sleep quality,[5] pain intensity,[6] psychosomatic symptoms (measured by a questionnaire previously used in adolescents with musculoskeletal pain),[35,42] and quality of life[24] (**TABLE 1**). Our research group has previously tested the measurement properties of the Psychosomatic Questionnaire for Children and adolescents, and it showed borderline internal consistency (Cronbach's α coefficient: 0.69 (0.62 to 0.68)), adequate reliability (intraclass correlation coefficients: 0.75 (0.64 to 0.84)), and adequate construct validity. Furthermore, the original version of the Psychosomatic Questionnaire for Children and adolescents was previously tested with a structural validity with 1 dimension and internal consistency of 0.57.[41]

We collected information about sex, age, weight, height, body mass index, transport to school, screen time, relationship with the family, perception of

TABLE 1 Outcomes and Their Respective Measurements

Construct	How Was Measured
Sex	Female/male
Age	Complete age in years
Weight	kg
Height	cm
Body mass index	kg/m²
Socioeconomic level[31]	A1 (R$ 8099.01-14 366.00/month) A2 (R$ 4558.01-8099.00/month) B1 (R$ 2327.01-4558.00/month) B2 (R$ 1391.01-2327.00/month) C1 (R$ 933.01-1391.00/month) C2 (R$ 618.01-933.00/month) D (R$ 403.01-618.00/month) E (until R$ 403.00/month)
Transport to school	Car School bus Motorcycle Bus Train On foot Bicycle Other
Screen time (TV or video game)	< 1 h / 1-2 h / 3-5 h / > 5 h
Relationship with the family	Excellent / Good / Not so good / Bad
Perception of backpack weight as heavy	Yes / No
How heavy is your backpack?	Too heavy / Heavy / Not too heavy
Practice of sports regularly	Yes / No
Days practicing sports	1-7 days
Presence of back pain[29]	Presence and Impact of Pain in Kids (PIP-Kids): "Yes" to question "Has your back, neck, upper limb or lower limb been painful at any time in the last month?" and choose "back" as the region of pain in "Where is the most common site of pain?"
Back pain chronicity[29]	Presence and Impact of Pain in Kids (PIP-Kids): "Yes" to question "Has your back, neck, upper limb or lower limb pain ever lasted for more than 3 months off and on (it hurt at least once a week but not every day)?" or "Has your back, neck, upper limb or lower limb pain ever lasted for more than 3 months continuously (it hurts more or less every day)?"
Back pain impact[29]	Presence and Impact of Pain in Kids (PIP-Kids): "Yes" to question "Have you sought health professional advice or treatment for back, neck, upper limb or lower limb pain in the last month?", "Have you taken medication to relieve the back, neck, upper limb or lower limb pain in the last month?", "Have you missed school due to the back, neck, upper limb or lower limb pain in the last month?", "Has the back, neck, upper limb or lower limb pain interfered with your normal activities in the last month?" and "Has the back, neck, upper limb or lower limb pain interfered with recreational physical activities (eg, sport, walking, cycling) in the last month?"
Presence of back pain reported by parents and/or guardians[29]	Presence and Impact of Pain in Kids (PIP-Kids) adapted version to parents and/or guardians: "Yes" to question "Did your child felt their back, neck, upper limb or lower limb been painful at any time in the last month?" and choose "back" as the region of pain in "Where is the most common site of pain?"

Table continues on next page.

backpack weight as heavy, sports participation, and socioeconomic level. To estimate socioeconomic level, we used the classification from the Brazilian Association of Research Companies (English for *Associação Brasileira de Empresas de Pesquisa*), where level A1 is the highest socioeconomic level (R$ 8099.01–14 366.00/month) and E is the lowest (R$ 403.00/month).[31]

Sample Size

The sample of this study was drawn from the Brazilian study of musculoskeletal disabling pain in children and adolescents (*estudo BRasileiro de dor iNcapacitante em Crianças e Adolescentes*, ie, BRINCA); thus, we did not calculate a specific sample size for this study.

Statistical Methods

We used descriptive statistics to summarize the characteristics of the sample. Mean and standard deviation (SD) were used for continuous data, and absolute frequency/percentage was used for categorical or dichotomous data. Prevalence, chronicity, and impact of back pain were measured by the absolute frequency, percentage, and confidence intervals (CIs) of participants who self-reported back pain (in the last month) at baseline. Back pain prognosis was measured by absolute frequency, percentage, and CI of recovery from back pain for those with back pain at baseline over follow-up timepoints. Incidence of back pain was measured by absolute frequency, percentage, and CI of new cases of back pain for those without back pain at baseline at each follow-up timepoint.

We compared baseline characteristics of children and adolescents with and without back pain, baseline characteristics of children of public and private schools, baseline characteristics for who recovered and who developed back pain through mean differences (continuous variables), odds ratio (categorical or dichotomous variables), and respective CIs. The baseline characteristics included: sex, age, perception of backpack weight,

TABLE 1 Outcomes and Their Respective Measurements (continued)

Construct	How Was Measured
Pain intensity[6]	Numerical Rating Scale (NRS): 0-10—higher scores, higher pain intensity
Psychosomatic Symptoms[41,42]	Psychosomatic Questionnaire for Children and Adolescents: 0-18—higher scores, higher psychosomatic symptoms
Quality of life[24]	Pediatric Quality of Life Inventory (PedsQL): 0-100—higher scores, better quality of life
Sleep quality[5]	Pediatric Sleep Questionnaire: 0-22—higher scores, higher sleep disturbance

screen time, quality of life, psychosomatic symptoms, sports participation, and pain intensity.[7,8,34,39,43–45] We also compared the prevalence of disabling musculoskeletal pain reported by children and adolescents with the report from parents/guardians using a cross-tab, frequency, and CIs. We treated missing data (ie, those participants who answered the baseline assessment, and missed an item) and follow-up loss (ie, those participants who for any reason did not answer the follow up assessments) from the main outcomes (presence of back pain during baseline, and follow-ups) with multiple imputation by chained equations inside the regression model. We included the following variables: presence or not of back pain during baseline and follow-ups, sex, and age as predictors when imputing missing values.[21] All analyses were performed in IBM SPSS software version 23.0 (IBM corporation, Somers, NY) and Excel (Excel for Mac 2011, Version 14.7.3; Microsoft), and the confidence intervals for frequency counts were estimated by the CI Calculator from Physiotherapy Evidence Database (PEDro).[13]

RESULTS

In this study, 3077 children and adolescents were invited, and 615 children and adolescents were included (**FIGURE 1**). The mean age was 11.6 (SD = 2.5) years; 362 participants were female (59%). Children from public and private schools had few differences in characteristics (**SUPPLEMENTAL FILE 2**). We had a loss to follow-up of 24.3%. From those participants who answered baseline and follow-up assessments, the missing data were 0.2% for the main outcomes (reporting of back pain). We imputed data regarding loss to follow-up and missing data for the main outcome variables.

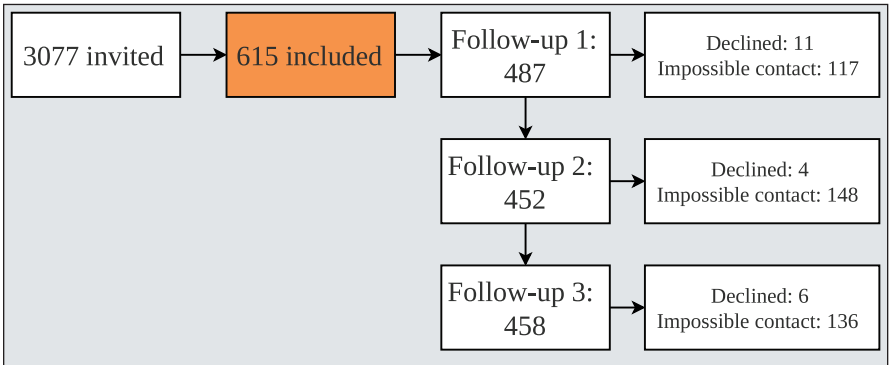

FIGURE 1. Flow diagram of included children and adolescents and follow-up period.

Prevalence

At baseline, 163 children and adolescents reported back pain in the last month (26.5%; 95% CI: 23.2, 30.1). Of these, 69 children and adolescents reported intermittent chronic back pain (42.3%; 95% CI: 35.0, 50.0) and 40 reported continuous chronic back pain (24.5%; 95% CI: 18.6, 0.32) in the last month.

Participants who reported back pain were heavier (4.4 kg), were taller (0.04 m), and practiced more days of sports (0.8 days) than participants who did not report back pain. Those who were from high socioeconomic level (class A1) had lower odds of having back pain 0.2 (95% CI: 0.1, 0.8), higher odds of having poorer relationship with family 1.5 (95% CI: 1.1, 2.2), more negative psychosomatic symptoms 1.4 (95% CI: 0.7, 2.0), poorer quality of life -5.0 (95% CI: -7.5, -2.5), and poorer sleep quality 1.6 (95% CI: 1.0, 2.2) than participants without back pain. Those who travelled more often by car, those who travelled to school more often on foot, and those who used motorbike less as a transport reported less back pain at baseline (**TABLE 2**).

Impact of Back Pain

Of 163 children and adolescents who reported back pain in the last month, 23 (14.1%; 95% CI: 9.6, 20.3) reported they sought a health professional advice or treatment, 47 (28.8%; 95% CI: 22.4, 36.2) had taken medication, and 26 (15.9%; 95% CI: 11.1, 22.3) had missed at least 1 school day. From 163 children and adolescents, 27 (16.6%; 95% CI: 11.6, 23.0) and 35 (21.5%; 95% CI: 15.9, 28.4) reported that back pain interfered in their normal activities and in recreational physical activities in the last month, respectively.

Prognosis

Of the 163 children and adolescents with back pain at baseline, 136 (95% CI: 77.0, 88.4) recovered during the 12-month follow-up period (**TABLE 3**). The proportion of recovery was greater in the first 3 months (**FIGURE 2**). Boys had higher

TABLE 2 Baseline Characteristics From Children and Adolescents With and Without Back Pain

	Total Sample Size (n = 615)	Children and Adolescents With Back Pain (n = 163)	Children and Adolescents Without Back Pain (n = 452)	Mean Differences[a]/Odds Ratio and CIs
Variables				
Sex; n (%)				
Female	362 (58.6)	92 (56.4)	268 (59.3)	0.9 (0.6, 1.3)
Male	256 (41.4)	71 (43.6)	184 (40.7)	1.1 (0.8, 1.6)
Age (years)	11.59 (2.5)	12.13 (10.1)	11.53 (2.2)	0.6 (-0.39, 1,59)[a]
Weight (kg)	48.35 (15.3)	52.03 (14.4)	47.60 (14.5)	**4.4 (1.83, 7.03)[a]**
Height (m)	1.52 (0.1)	1.55 (0.2)	1.51 (0.1)	**0.04 (0.02, 0.06)[a]**
BMI (kg/m^2)	20.57 (4.5)	21.15 (4.4)	20.51 (4.0)	0.64 (-0.10, 1.38)[a]
Socioeconomic level; n (%)				
Class A1	34 (5.5)	3 (1.8)	31 (6.9)	**0.2 (0.1, 0.8)**
Class A2	99 (16.0)	25 (15.3)	74 (16.4)	0.9 (0.6, 1.5)
Class B1	149 (24.1)	39 (23.9)	108 (23.9)	1 (0.7, 1.5)
Class B2	119 (19.3)	36 (22.1)	82 (18.1)	1.3 (0.8, 2.0)
Class C1	123 (19.9)	37 (22.7)	86 (19.0)	1.2 (0.8, 1.9)
Class C2	31 (5.0)	11 (6.8)	20 (4.4)	1.6 (0.7, 3.3)
Class D	10 (1.6)	1 (0.6)	9 (1.0)	0.3 (0.0, 2.4)
Class E	21 (3.4)	3 (1.8)	18 (4.0)	0.4 (0.1, 1.5)
Transport to school; n (%)				
Car	20 (33.7)	41 (25.2)	166 (36.7)	**0.6 (0.4, 0.9)**
School bus	83 (13.4)	21 (12.9)	61 (13.5)	0.95 (0.6, 1.6)
Motorcycle	6 (1.0)	4 (2.5)	2 (0.4)	**5.7 (1.0, 31.2)**
Bus	41 (6.6)	7 (4.3)	34 (7.5)	0.5 (0.2, 1.3)
Train	1 (0.2)	0 (0)	1 (0.2)	
On foot	250 (40.5)	84 (51.5)	166 (36.7)	**1.8 (1.3, 2.6)**
Bicycle	0 (0)	0 (0)	0 (0)	-
Other	1 (0.2)	1 (0.6)	0 (0)	-
Screen time; n (%)				
< 1 h	85 (13.8)	32 (19.6)	53 (11.7)	**1.8 (1.1, 3.0)**
1-2 h	212 (34.3)	50 (30.7)	162 (35.8)	0.8 (0.5, 1.2)
3-5 h	229 (37.1)	57 (35.0)	172 (38.1)	0.9 (0.6, 1.3)
> 5 h	76 (12.3)	23 (14.1)	53 (11.7)	1.2 (0.7, 2.1)
Relationship with family; n (%)				
Excellent	278 (45.0)	63 (38.7)	215 (47.6)	0.7 (0.5, 1.0)
Good	289 (46.8)	89 (54.6)	200 (44.3)	**1.5 (1.1, 2.2)**
Not so good	42 (6.8)	9 (5.5)	33 (7.3)	0.7 (0.3, 1.6)
Bad	3 (0.5)	1 (0.6)	2 (0.4)	1.4 (0.1, 15.4)
Perception of backpack weight as heavy; n (%)				
Yes	356 (57.6)	102 (62.6)	254 (56.2)	1.3 (0.9, 1.9)
No	245 (39.6)	58 (35.6)	187 (41.4)	0.8 (0.5, 1.1)
How heavy is your backpack?[b]; n (%)				
Too heavy	77 (21.6)	25 (24.5)	52 (20.5)	1.3 (0.7, 2.2)
Heavy	190 (53.4)	59 (57.8)	131 (51.6)	1.3 (0.8, 2.0)
Not too heavy	84 (23.6)	18 (17.6)	66 (26.0)	0.6 (0.3, 1.1)

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TABLE 2 Baseline Characteristics From Children and Adolescents With and Without Back Pain (continued)

	Total Sample Size (n = 615)	Children and Adolescents With Back Pain (n = 163)	Children and Adolescents Without Back Pain (n = 452)	Mean Differences[a]/Odds Ratio and CIs
Practice of sports regularly; n (%)				
Yes	289 (46.8)	75 (46.01)	214 (47.3)	0.9 (0.7, 1.4)
No	322 (52.1)	87 (53.4)	235 (52.0)	1.1 (0.7, 1.5)
Days practicing sports[c] (1-7); mean (SD)	2.9 (1.8)	3.5 (1.9)	2.7 (1.8)	**-0.8 (-1.3, -0.3)**
Pain intensity NRS (0-10); mean (SD)	-	4.8 (2.4)	-	-
Psychosomatic Symptoms (0-18); mean (SD)	6.5 (3.4)	6.8 (3.7)	5.4 (3.6)	**1.4 (0.7, 2.0)[a]**
Quality of life (0-100); mean (SD)	73.9 (13.8)	74.6 (14.0)	79.6 (13.6)	**-5.0 (-7.5, -2.5)[a]**
Sleep quality (0-22); mean (SD)	4.7 (3.6)	5.7 (3.6)	4.1 (3.4)	**1.6 (1.0, 2.2)[a]**

Abbreviations: BMI, body mass index; CIs, confidence intervals.
[a]*Mean differences.*
[b]*Related to who perceived their backpack weight as heavy.*
[c]*Related to who practice sports.*
Note: Values in bold indicate statistically significant differences.

odds of recovery from back pain 2.3 (1.2 to 4.4) than girls. Those recovering from back pain had lower pain intensity 1.1 (0.4 to 1.8) and higher odds of perceiving their backpack as not too heavy 3.7 (1.1 to 12.1) at baseline than those who did not recover from back pain during the follow-up period (**SUPPLEMENTAL FILE 3**).

Incidence

Of the 452 children and adolescents who did not have back pain at baseline, 159 (95% CI: 30.9, 39.7) developed back pain during the following 12 months (**SUPPLEMENTAL FILE 4**). Girls had 2.7 times greater odds of developing back pain than boys. Children and adolescents who developed back pain during 1-year follow-up were older (0.9 years) and heavier (3.2 kg) than those who did not develop back pain. Those who developed back pain had more negative psychosomatic symptoms -2 (-2.6 to -1.4), poorer quality of life 5.2 (2.6 to 7.8), higher odds of having poorer relationship with family 1.6 (1.1 to 2.3), and higher odds of perceiving their backpack weight as heavy 1.7 (1.2 to 2.6). (**SUPPLEMENTAL FILE 5**).

TABLE 3 Prognosis of Back Pain During 12-Months Follow-up (n = 163)

	3-months		6-months		12-months	
	n	% (95% CIs)	n	% (95% CIs)	n	% (95% CIs)
Recovered*	95	58.3 (50.6, 65.6)	116	71.2 (63.8, 77.6)	136	83.4 (77.0, 88.4)
Non-recovered	68	41.7 (34.4, 49.4)	47	28.8 (22.4, 36.2)	27	16.6 (11.6, 23.0)
Recurrence of back pain*	n/a	n/a	16	9.8 (6.1, 15.4)	42	30.9** (23.7, 39.1)

Abbreviations: CIs, confidence intervals; n/a, not applicable.
**Cumulative.*
***Children and adolescents who recovered from back pain.*

Association Between Report of Children and Adolescents and Their Parents/Guardians

At baseline 141 (22.9%; 95% CI: 19.8, 26.4), parents/guardians reported that their child had back pain. Among the 163 (26.5%) children and adolescents who reported having back pain at baseline, 90 (55.2%; 95% CI: 47.5, 62.6) of their parents/guardians reported that they believed their children and adolescents did not have back pain. Children and parents agreed in 73.8% (95 % CI: 70.1, 77.1) of the cases regarding the presence or absence of back pain. (**SUPPLEMENTAL FILE 6**).

DISCUSSION

Over 1 in 4 children and adolescents in the São Paulo state, Brazil, reported experiencing back pain in the past month. Overall, prognosis was positive: a recovery rate of 83.4% over 12 months. However, almost a third of participants had recurring back pain. For 2-3 of every 10 children and adolescents, back pain persisted during the 12-month study period. Over the course

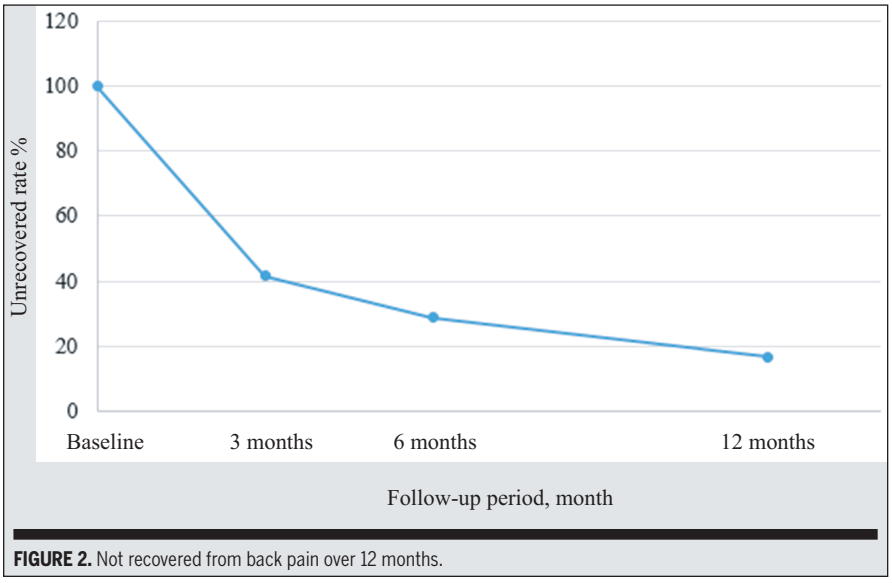

FIGURE 2. Not recovered from back pain over 12 months.

of 12 months, 35.2% of the children who were pain-free at baseline reported back pain.

Our prospective longitudinal cohort study focused on the onset and prognosis of back pain in children and adolescents in a middle-income country. This study was conducted in different cities in the São Paulo state (including São Paulo city), where almost half the population are immigrants from other states.[16,30] We included children and adolescents from public and private schools to better represent the population. As Brazil is an upper-income to middle-income country and São Paulo is the richest state in Brazil,[15,40] the findings should be interpreted with caution as results may be different from other regions and other low-income and middle-income countries due to differences in socioeconomic characteristics. The sample size is moderate for precisely describing prevalence, prognosis, and incidence. Under 5% of children and adolescents answered the follow-up questionnaires through an online survey, and it is unclear how this could influence results. There is no consensus on how to measure sport participation, relationship with the family and perception of backpack weight. Therefore, we caution the reader to carefully interpret our results.

Previous studies have investigated the prevalence, prognosis, and incidence of back pain in children and adolescents.[1,8,23,27] Previous studies conducted in Brazil found higher prevalence than our findings, ranging from 46.9 to 57%.[28,37,38] These differences may be due to differences in the recall period. We used 1-month period, whereas previous studies have used between 3 and 12 months. Another reason is that there is an inconsistency in the literature regarding the use of a standard instrument to identify and assess back pain in children and adolescents. Our results were similar to studies conducted in high-income countries, including in adult populations.[23,26] Previous studies found slightly lower recovery rates from back pain in children and adolescents.[17,27] A previous study found rates of recovery from back pain over 12 months ranging from 65.6% to 68.1%.[27] This was based on pain that persisted for a week or more. In our study, we asked if children and adolescents felt back pain in the last month but did not specify a minimal duration. The rate of pain persistence and incidence in our study was similar to that in previous research.[1,17]

Children and adolescents with and without back pain were different with regard to weight, height, socioeconomic level, transportation to school, screen time, days practicing sports, and relationship with the family. Caution is necessary when interpreting these results because they are based on initial study in a middle-income country, and previous systematic reviews (in high-income countries) do not broadly support our findings.[14,18,32,39] Negative psychosomatic symptoms, quality of life, and sleep quality also need more study in middle-income and low-income settings.[14,32]

Our results confirm the burden of back pain in children and adolescents. Although 83.4% of children and adolescents recovered from back pain, recurrence and new cases were common. Better clinical management and more effective prevention strategies are sorely needed. Around 15% of parents/guardians underestimate their children's pain; hence, reports from children and their parents may not be interchangeable.[19]

Future studies to answer causal and predictive questions are needed. Answering causal questions (eg, What is the effectiveness of a certain treatment strategy for children with back pain? What are the risk factors for children and adolescents to develop back pain?) can help clinicians find treatment targets and recognize risk factors that influence the development of back pain in this population. Developing predictive models from baseline variables will help answer questions about prognosis or risk (eg, children who are more likely to recover from back pain or those at higher risk of persistent pain). Finally, more research is needed to understand back pain in children and adolescents from low-income countries.

CONCLUSION

One in 4 children and adolescents in São Paulo reported experiencing back pain at any point in time. Most recover over 12 months (83.4%), but a third will experience a recurrence of back pain. New cases of back pain were reported by 3-4 in every 10 children and adolescents over a 12-month period. ◉

KEY POINTS

FINDINGS: Over 1 in every 4 children and adolescents suffer from back pain in any given month. Most recover over 12 months, but back pain recurs for around 1 in every 3 children and adolescents. Three to 4 new cases of back pain in every 10 children and adolescents are reported in a given 12-month period.

IMPLICATIONS: Low back pain is common in children and adolescents, with good prognosis for most. Recurrence happens in around a third of children and adolescents who may need more support from musculoskeletal rehabilitation clinicians.

CAUTION: This is the first longitudinal study of back pain in children and adolescents conducted in a middle-income country. More studies are necessary to confirm our findings.

STUDY DETAILS

AUTHOR CONTRIBUTIONS: Veronica Souza Santos, Mariana Nascimento Leite, Barbara Isabel Aparecida Camargo, and Tiê P. Yamato were in charge of the acquisition of data. Veronica Souza Santos and Tiê P. Yamato were in charge of data analysis. Veronica Souza Santos, Mariana Nascimento Leite, Tiê P. Yamato were in charge of drafting the work. All authors contributed to the conception or design of the work, interpretation of data, and revision of the manuscript; approved the final version to be published; and agreed to be accountable for all aspects of the work.

DATA SHARING: Data are available upon request.

PATIENT AND PUBLIC INVOLVEMENT: No patients or consumer representatives were involved in the design or conduct of this study.

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