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Report Card Brazil: an updating systematic review of the prevalence of overweight and obesity in Brazilian children and adolescents

Report Card Brasil: uma revisão sistemática atualizada da prevalência de sobrepeso e obesidade em crianças e adolescentes brasileiros

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Abstract – The objective of the present study was to summarize the prevalences, secular trends, and associated factors of overweight and obesity among Brazilian children and adolescents in order to update the 2018 and 2019 data published in the 2020 Report Card. A systematic search was conducted in nine databases, restricted to studies published between January 2020 and December 2024. After the analysis of 82 studies, the overall prevalences were 18.4% for overweight, 10.7% for obesity, and 29.7% for excess weight. When considering the overall data stratified by sex, boys presented slightly higher prevalences than girls for overweight (18.3% vs. 18.1%), obesity (11.2% vs. 9.7%), and excess weight (31.9% vs. 29.9%). When stratified by children and adolescents, prevalences of 18.3% and 18.5% were observed for overweight, 16.5% and 8.5% for obesity, and 35.3% and 28.5% for excess weight, respectively. Secular trend studies indicate stabilization in the prevalences of overweight, obesity, and excess weight among boys, whereas among girls these prevalences continue to increase. Based on these findings, preventive measures aimed at reducing the prevalences of overweight and obesity should be developed and strengthened, as well as treatment programs focused on the management of childhood obesity, which should be considered a top priority within the public health system.

Key words: Public Health; Epidemiology; Pediatrics; Body Mass Index.

Resumo – *O objetivo do presente estudo foi sumarizar as prevalências, tendências seculares e fatores associados ao sobrepeso e à obesidade em crianças e adolescentes brasileiros, a fim de atualizar os dados de 2018 e 2019 publicados no Report Card de 2020. A busca sistemática foi conduzida em nove bases de dados, restrita a estudos publicados durante o período de janeiro de 2020 a dezembro de 2024. Após a análise de 82 estudos, as prevalências gerais foram de 18,4% para sobrepeso, de 10,7% para obesidade e de 29,7% para excesso de peso. Ao considerar os dados gerais de acordo com o sexo, os meninos apresentaram prevalências levemente superiores às meninas de sobrepeso (18,3% vs. 18,1%), obesidade (11,2% vs. 9,7%) e excesso de peso (31,9% e 29,9%). Ao estratificar as informações por crianças e adolescentes, foram observadas prevalências de 18,3% e 18,5% para sobrepeso, de 16,5% e 8,5% para obesidade e de 35,3% e 28,5% para excesso de peso, respectivamente. Estudos de tendência secular demonstram uma estabilização nas prevalências de sobrepeso, obesidade e excesso de peso nos meninos, enquanto nas meninas as prevalências ainda apresentam ascensão em seus valores. A partir disso, medidas preventivas voltadas à redução das prevalências de sobrepeso e obesidade devem ser desenvolvidas e fortalecidas, assim como programas de tratamento direcionados ao manejo da obesidade infantil, os quais devem constituir prioridade máxima no âmbito do sistema público de saúde.*

Palavras-chave: *Saúde Pública; Epidemiologia; Pediatria; Índice de Massa Corporal.*

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INTRODUCTION

Obesity is a chronic disease of multifactorial origin that has shown exponential increases in prevalence, becoming one of the main global public health problems[1,2]. This accelerated growth has occurred particularly over recent decades. In 1990, 8.1% of children (5 to 14 years) and 9.9% of youths (15 to 24 years) had Excess weight (overweight or obesity), whereas in 2021 these figures reached 18.1% and 20.3%, respectively, representing a doubling over a 30-year period[3]. This scenario is concerning, as it is estimated that by 2050, one third of children and adolescents will be living with overweight or obesity[3].

Despite the global upward trend in overweight and obesity, the evolution of prevalence varies across countries. High-income nations had already experienced rapid increases before 1990. Since then, the largest increments have been driven by countries in Latin America, North Africa, and the Middle East[3]. In Brazil, data from the Ministry of Health revealed prevalences of 13.4% for overweight and 4.2% for obesity among adolescents in 2008, increasing in 2024 to 18.8% and 13.1%, respectively, tripling the population of youths with obesity during this periodz[4]. These prevalences were similar between boys and girls[4,5].

However, regional differences in prevalence are observed within Brazil. The highest prevalences of Excess weight are found in the South and Southeast regions, possibly due to economic and cultural factors. These regions were the first to undergo accelerated urban development, which promoted socioeconomic improvements and greater access to education[6]. Nevertheless, the population also gained increased access to ultra-processed foods and experienced behavioral changes, such as reductions in physical activity levels and increases in sedentary behavior, factors that have contributed to the rising prevalences of overweight and obesity[1,5,6].

The growing burden of overweight and obesity among children and adolescents in Brazil may have significant impacts on health across generations[7,8], considering that youths with obesity are about five times more likely to remain obese in adulthood[8] and that offspring of individuals with Excess weight are also at higher risk of developing this condition[7].

Several public health concerns emerge in the context of increasing obesity prevalence and its adverse consequences. Individuals with obesity have a higher likelihood of developing cardiometabolic diseases[9], psychiatric disorders[10,11] and increased all-cause mortality[12,13]. These negative outcomes substantially affect the health of the exposed population, resulting in greater demand for healthcare services in Brazil[14] and imposing an estimated burden of approximately US$ 654 million in direct costs on the public healthcare system[15]. Furthermore, it is estimated that the continued rise in overweight and obesity prevalence will result in 1.8 billion international dollars (Int$) between 2021 and 2030 in direct healthcare costs related to obesity-associated noncommunicable chronic diseases[16].

Understanding the evolution of overweight and obesity among Brazilian children and adolescents has been the subject of previous systematic investigations. A pioneering study synthesized available data published between 2014 to 2018[17], providing an initial overview. Subsequently, Pelegrini et al.[18] expanded this analysis by summarizing information from studies conducted in 2018 to 2019. The present study builds on this line of research, aiming to extend and deepen the analysis of prevalences, secular trends, and associated factors by incorporating more recent data and consolidating accumulated knowledge.

The rapid epidemiological dynamics of obesity in Brazil, combined with the emergence of new data and the need to monitor the impact of recent events (e.g., the COVID-19 pandemic), make continued updates imperative. Thus, this review seeks to fill this gap by providing an updated synthesis that reflects the most recent Brazilian scenario. Therefore, the objective of the present study is to summarize the prevalences, secular trends, and associated factors of overweight and obesity among Brazilian children and adolescents.

METHODS

Records

This systematic review is part of the research project Brazilian Report Card: Health Indicators for Children and Adolescents (4th edition). The macro-project protocol is registered on an open access platform and can be accessed at https://osf.io/y2q8z/. The information presented in this review represents an update of previously published results, which summarized data on prevalences, secular trends, and factors associated with overweight and obesity among Brazilian children and adolescents for the periods 2014 to 2018[17] and 2018 to 2019[18]. The structure and reporting of the present review are in accordance with the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)[19].

Eligibility criteria

Studies were included in this review if they met the following criteria: a) observational study design (cross-sectional, secular trend, or cohort); b) conducted with Brazilian children and adolescents aged 7 to 19 years; c) published in Portuguese, English, or Spanish; d) used body mass index (BMI) as the anthropometric indicator to determine body weight status; e) published in full; f) aimed to identify factors associated with overweight and obesity. In this context, studies were considered eligible if they used BMI as the outcome in the analyses and/or reported their results in terms of prevalences of overweight and obesity or Excess weight (overweight + obesity).

The following exclusion criteria were applied: a) review studies, undergraduate theses, dissertations, theses, books, book chapters, and abstracts presented at scientific conferences; b) absence of reference to the cutoff points used for the classification of overweight/obesity; c) not describing the results according to sex; d) absence of results presented separately for children and adolescents.

Based on these eligibility criteria, studies that allowed the calculation of prevalences from absolute values reported in the results tables were also included. For studies involving children and adolescents, this systematic review adopted the age range of 10 to 19 years for the classification of adolescents[20]. Accordingly, studies involving children were expected to include participants aged 7 to 9 years. However, due to inconsistencies in the standardization of age ranges in studies with children and the underrepresentation of this population in literature, samples aged 7 to 11 years were also included, provided that no older participants were involved. In studies that included mixed samples of children and adolescents, the prevalences reported in the summary tables refer to results obtained for the total sample.

Information sources

The searches were conducted on March 16, 2025. The databases consulted were MEDLINE/PubMed, Web of Science (WoS), Scopus, Virtual Health Library (BVS), SciELO, CINAHL/EBSCO, SPORTDiscus/EBSCO, PsycINFO/APA, and Embase. All studies published between January 1, 2020, and December 31, 2024, were considered.

Search strategy

The terms used to create the search keys were identified in the Medical Subject Headings (MeSH). The Boolean operator "OR" was used to separate the terms in each block, while the Boolean operator "AND" was used between the blocks of terms. From this, the following search key was created: (prevalence OR frequency) AND (obesity OR obese OR overweight) AND (children OR adolescent OR youth OR schoolchildren) AND (Brazil OR Brazilian). The search key was adapted according to the particularities of each database.

Study selection

After the removal of duplicate records, study selection was conducted independently by two researchers (JCPDM and CCM). Initially, titles and abstracts were screened to identify studies that did not meet the predefined inclusion criteria. Subsequently, full-text articles were assessed to determine eligibility for inclusion in the review. At each stage, meetings were held to discuss potential disagreements regarding study inclusion or exclusion. In cases of disagreement, the assessment of a senior researcher (AP) would be requested; however, this intervention was not necessary, as no persistent disagreements occurred.

The online reference management software *EndNote®* (online version; Clarivate Analytics™) was used to identify and remove duplicate records. The data were then exported to the Rayyan online platform (Qatar Computing Research Institute), where the blinded selection and exclusion process was conducted by the reviewers.

Risk of bias

The risk of bias for each study was assessed using the tool recommended by the National Heart, Lung, and Blood Institute for observational studies, the "*Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies*"[21], was used to assess the risk of bias in each study. This tool evaluates studies based on criteria related to the research question, study population, recruitment of groups, eligibility criteria, sample size, exposure assessment, timing relative to the expected outcome, exposure levels of interest, exposure measurement and assessment, outcome measures, blinding of outcome assessment, follow-up rate, and statistical analysis. Each criterion can be rated as "yes," "no," "not applicable," "not reported," or "cannot determine." An overall score was generated based on the number of "yes" responses, with higher scores indicating a lower risk of bias. The results of the risk of bias assessment are presented in Supplementary File 1 (https://osf.io/gr3cb/).

RESULTS

General characteristics of the studies

The database searches related to studies investigating the prevalences of overweight and obesity among Brazilian children and adolescents identified a total of 3,645 records. After the exclusion of 1,832 duplicate studies, titles and abstracts (n = 1,813) and full texts (n = 225) were screened. Ultimately, 82 studies were considered eligible for inclusion in the present systematic review (Figure 1).

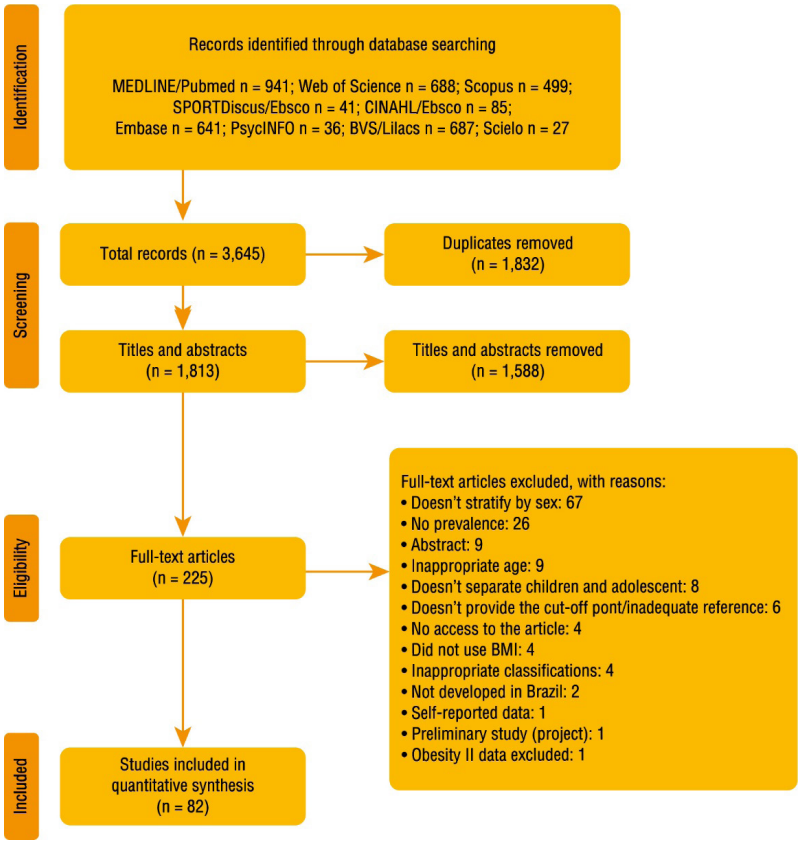

Figure 1. Flowchart of the systematic review

The main characteristics of the studies included in the review are presented in Table 1. Regarding the locations where the studies were conducted, most were carried out in the Southeast (25/82; 30.4%) and South (22/82; 26.8%) regions of Brazil, followed by the Northeast (15/82; 18.3%), Midwest (2/82; 2.4%), and North (2/82; 2.4%). An additional 16 studies (16/82; 19.5%) included nationally representative samples, of which 62.5% of the data came from the *Study of Cardiovascular Risks in Adolescents* (ERICA), 31.3% from the *National Survey of School Health* (PeNSE), and 6.3% from the *Household Budget Survey* (POF).

Most studies (87.8%) used the World Health Organization (WHO) criteria to determine overweight and obesity. Other criteria included those proposed by the International Obesity Task Force (IOTF; 8.5%), the Centers for Disease Control and Prevention (CDC; 2.4%), and national references proposed by Conde and Monteiro (1.2%). Regarding study design, 90.2% were cross-sectional (n = 74), 8.5% used a secular trend design (n = 7), and only 1.2% were longitudinal (n = 1).

Table 1. Characteristics of studies on the prevalence of overweight and obesity in Brazilian children and adolescents.

Cross-sectional studies														
Author/Year	Location	Sample (date of collection; % girls)	Age	Overweight			Obesity			Excess weight			Cutoff	Statistical analysis
				Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total		
Alves et al. (2024)[33]	Goiânia, GO	178 (2011; 51.1% girls)	11 to 19	17.3	12.1	-	11.5#	19.0#					WHO	
Bacil et al. (2020)[34]	Curitiba, PR	2347 (2016; 48.7% girls)	11 to 15							26.7	25.2	26.0	IOTF	
Barros et al. (2020)[35]	Sobral, CE	80 (Data not reported; 51.3% girls)	8 to 11	17.9	9.8	13.8	17.9	17.1	17.5			31.3	WHO	Chi-square
Barros et al. (2021)[36]	Fortaleza, CE	826 (2015; 56.7% girls)	10 to 19							34.9	30.1	32.2	WHO	
Blaudt et al. (2023)[37]	Brasil (ERICA)	71740 (2013/14; 49.8% girls)	12 to 17	16.6	17.5		9.1	7.6					WHO	Logistic regression
Bricarello et al. (2021)[38]	Brasil (ERICA)	71533 (2013/14; 48.8% girls)	12 to 17							25.4*	24.7*	25.0*	WHO	Poisson regression
Buffani et al. (2020)[39]	Pelotas, RS	4101 (2008; 51.2% girls)	15							29.7	25.6		WHO	
Caixeta and Amato (2020)[40]	Patos de Minas, MG	486 (2016/17; 51.4% girls)	6 to 8							53.3	46.7		CDC	Poisson regression
Canella et al. (2020)[41]	Brasil (POF)	31892 (2008/09; 48.9% girls)	11 to 19	15.4	14.7	15.1*	5.1	3.7	4.4*	20.1	18.4	19.3*	WHO	
Canuto et al. (2021)[42]	Barbacena, MG	326 (2018; 51.8% girls)	7 to 9			16.0			14.7#	35.0*	26.6*	30.7	WHO	Logistic regression
Carvalho Souza et al. (2023)[43]	Fortaleza, CE	173 (2017; 46.8% girls)	10 to 17							52.4	47.6	24.3	WHO	
Carvalho et al. (2023)[44]	São Luís, MA	634 (2016; 54.4% girls)	18 to 19	11.4	17.1	14.5*	3.8	0.0	1.7*				WHO	
Araújo (2023)[45]	Barra do Garças, MT	80 (Data not reported; 40.0% girls)	7 to 10	35.4*	25.0*	31.2*	31.2*	15.6*	25.0*	66.7*	40.6*	56.2*	WHO	
da Rocha et al. (2022)[46]	Brasil (ERICA)	35737 (2013/14; 56.9% girls)	12 to 17							27.2	24.9	25.8	WHO	
da Silva et al. (2020)[47]	Goiana, PE	49 (2019; 63.3% girls)	10 to 14	22.2	19.4	20.4	16.7	12.9	14.3				WHO	
da Silva et al. (2020)[48]	Brasil (ERICA)	71740 (2013/14; 49.8% girls)	12 to 17	16,6	17,5		7,6	9,2					WHO	
da Silva et al. (2023)[49]	Brasil (ERICA)	71552 (2013/14; 55.5% girls)	12 to 17							25.3*	23.8*	24.5*	WHO	
Damasceno de Lima et al. (2020)[50]	Araras, SP	449 (Data not reported; 53.5% girls)	7 to 10	14.8	16.3	15.7	16.3	9.6	12.7				WHO	
de Almeida Alves et al. (2020)[51]	Brasil (ERICA)	71298 (2013/14; 55.4% girls)	12 to 17			16.8			7.7	25.7	25.1	25.4	WHO	Logistic regression
de Jesus Araújo et al. (2023)[22]	Nazária, PI	134 (2020; 53.7% girls)	7 to 10	12.5	12.9	12.7	5.6	4.8	5.2				WHO	
de Lima Pereira et al. (2022)[52]	Uma cidade de médio porte em Minas Gerais	828 (2018/19; 57.6% girls)	14 to 19							25.4	29.8	27.9	WHO	
de Lima and Silva (2023)[53]	São José, SC	811 (2019; 51.0% girls)	14 to 19	18.6*	21.9*	20.3*	8.1*	9.4*	8.8*	29.7	31.4	29.1*	WHO	
dos Santos et al. (2020)[54]	Sertão e Agreste, PE	179 (2015 ;67.0% Girls)	10 to 19	6.8	16.7	13.4	10.2	5.0	6.7	16.9	21.7	20.1	WHO	Poisson regression

Note. *: prevalences summed by reviewers from absolute data provided in the article; #: grouping of obesity and severe obesity; ¥: prevalences calculated from provided data stratified by age. †: data are presented by age (7 to 10 and 11 to 14 – 2002 survey only data from 7 to 10 years), prevalences were calculated from absolute values.

Table 1. Continued...

Cross-sectional studies															
Author/Year	Location	Sample (date of collection; % girls)	Age	Overweight			Obesity			Excess weight			Cutoff	Statistical analysis
				Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total		
Duarte et al. (2021)[55]	Porto Alegre, RS	60 (Data not reported; 55.5% Girls)	6 to 11	11.1	24.2	18.3*	33.3	30.3	31.7*	44.4*	54.5*	50.0*	WHO	
Fantineli et al. (2020)[56]	Curitiba, PR	844 (2015; 52.5% Girls)	11 to 17	23.4	29.1	26.4	15.5	11.3	13.3	38.9*	40.4*	39.7*	WHO	
Faria et al. (2021)[57]	Santo André, SP	97 ∞ (2019; 54.6% Girls)	10 to 19							20.4*	24.5*	22.7*	WHO	
Farias et al. (2020)[58]	Porto Velho, RO	4165 (2013/16; 52.8% Girls)	9 to 18	20.2	17.6	18.8	10.2	6.6	8.3	30.4*	24.2*	27.1	WHO	
Ferreira and de Andrade (2021)[6]	Brazil (PeNSE)	8.517 (2015; 50.5% girls)	13 to 17							24.6	23.9	24.2	WHO	Poisson regression
Filgueiras et al. (2021)[59]	Belém, PA	55 (Data not reported; 54.5% girls)	Average age 13	20.0	31.0	25.4*	0.0	0.0	0.0*	20.0	31.0	25.4*	WHO	
Folmann et al. (2020)[60]	Cascavel, PR	1715 (2013/14; 51.0% girls)	10 to 17	15.0	14.2	14.6*	19.5	15.1	17.4*	34.5*	29.3*	31.9	WHO	
Franco et al. (2020)[61]	Rio Pomba, MG	42 (Data not reported; 45.2% girls)	15 to 17	17.4	5.3	11.9	4.3	5.3	4.8				WHO	
Freitas et al. (2020)[62]	Cidades do Norte de MG	2049 (Data not reported; 50.3% girls)	11 to 14	16.7	18.2	17.5	5.0	1.9	3.5				IOTF	
Freitas et al. (2023)[63]	Montes Claros, MG	4151 (Data not reported; 49.0% girls)	6 to 10	16.0	13.7	14.9	16.9	12.3	14.6	32.9	26.0	29.5	WHO	
Leal et al. (2020)[64]	São Paulo, SP	1156 (2009/13; 48.9% girls)	13 to 19	16.8	17.0	16.9	11.6	7.9	9.8				WHO,	
Lima et al. (2020)[65]	Maringá, PR	372 (2012; 66.9% girls)	12 to 14	26.0	23.3	24.2	6.5	8.4	7.8				Conde e Monteiro, 2006	
Lima et al. (2021)[66]	Recife, Pernambuco (ERICA)	2404 (2013/14; 53.6% girls)	12 to 17	16.8	15.7	16.3	10.3	9.6	10.0	28.5	26.3	25.5	WHO	Poisson regression
Lima et al. (2020)[67]	Criciúma, SC	583 (2016; 51.5% girls)	11 to 17							38.5*	29.0*	33.6*	WHO	Logistic regression
Lock et al. (2020)[68]	Porto Alegre, RS	1528 (2009/10; 49.6% girls*)	12	23.3	20.5	21.9*	12.0	15.1	13.5*				WHO	
Lourenço et al. (2022)[69]	Macaé, RJ	109 (2013/14; 64.2% girls)	14 to 18	18.0	20.0	19.3	5.1	7.1	6.4				WHO	Poisson regression
Lourenço et al. (2023)[70]	Macaé, RJ	148 (2016/17; 51.4% girls)	10 to 13	15.3	13.2	14.2	20.8	14.5	17.6				WHO	
Macêdo et al. (2020)[71]	Florianópolis, SC	595 (2012; 48.2% girls)	6 to 10	17.2	16.1	16.6	11.0#	10.8#	10.6#	28.3*	26.1*	27.3*	WHO	
Macêdo et al. (2020)[72]	Maceió, AL	386 (Data not reported; 52.1% girls)	14 to 19	20.0*	17.4*	18.7*	6.5*	6.0*	6.2*			24.9*	WHO	

Note. *: prevalences summed by reviewers from absolute data provided in the article; #: grouping of obesity and severe obesity; ¥: prevalences calculated from provided data stratified by age. †: data are presented by age (7 to 10 and 11 to 14 – 2002 survey only data from 7 to 10 years), prevalences were calculated from absolute values.

Table 1. Continued...

Cross-sectional studies														
Author/Year	Location	Sample (date of collection; % girls)	Age	Overweight			Obesity			Excess weight			Cutoff	Statistical analysis
				Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total		
Machado et al. (2021)[73]	Rio de Janeiro, RJ	101 (2015; 53.5% girls)	15 to 18	25.3*	16.7*	20.9*	10.6*	7.4*	8.9*				WHO	
Mara et al. (2024)[23]	Curitiba, PR	110 (2023; 41.1% girls)	8th grade students (average age 14.1)	35.7	24.1	30.0	3.6#	5.6#	4.6#	39.3	29.6	34.6	WHO	
Marques et al. (2020)[74]	Machado, MG	362 (2016; 52.8% girls)	14 to 19							26.9	28.8	27.9	WHO	
Marques et al. (2023)[75]	São Paulo, SP (SP-PROSO)	2680 (2017; 47.4% girls)	9th grade students (average age 14.9)	16.5	21.0	18.6	10.8	10.0	10.5				WHO	Multinomial logistic regression
Marques et al. (2022)[76]	Brasil (PeNSE)	4694 (2015; 49.4% girls)	13 to 17							22.9	24.5	23.7	WHO	
Medeiros et al. (2023)[77]	Brasil (ERICA)	73399 (2013/14: 55.4% girls)	12 to 17	11.0	12.3	11.6	3.3	4.1	3.7	16.4*	14.3*	15.3*	WHO	
Melo et al. (2022)[78]	Juiz de Fora, MG	804 (2018/19; 57.5% girls)	14 to 19	16.7	20.4	18.8*	9.4	9.5	9.4*	26.0*	30.1*	28.2*	WHO	
Miranda et al. (2022)[79]	São José dos Campos, SP	217 (2018/19; 64.1% girls)	11 to 15	18.0	16.6	17.0*	11.5	11.5	11.5*	29.5*	28.1*	28.6*	WHO	
Arruda Netaet al. (2024)[80]	João Pessoa, PB	1438 (2014; 52.9% girls)	10 to 14							33.2	32.1	32.6	WHO	Logistic regression
Ploharski et al. (2020)[81]	Santa Cruz do Sul, RS	1007 (Data not reported; 57.9% girls)	12 to 15							37.0	33.8	35.2	WHO	
Portella et al. (2021)[82]	São Caetano do Sul, SP	3062 (2011; 49.0% girls)	10 to 18	22.6	22.3	22.8*	14.2	11.5	12.5*				WHO	Generalized linear model
Ramirez et al. (2023)[83]	Alfenas, MG	269 (2018; 56.1% girls)	8 to 11							26.3*	22.5*	24.2*	WHO	
Rangel et al. (2020)[84]	Macaé, RJ	1267 (2013/14; 49.1% girls)	6 to 9	17.7	17.0	17.4	17.2	15.6	16.4	32.6*	34.9*	33.8*	WHO	
Rêgo et al. (2020)[85]	Rio de Janeiro, RJ	305 (2009; 43.0% girls)	10 to 18							44.2*	32.3*		WHO	
Ricarte et al. (2024)[24]	Fortaleza, CE	1001 (2018/22; 53.3% girls)	10 to 18	22.4	17.4	19.6	12.9	18.4	15.2				WHO	
Ritter (2021)[86]	Brasil (ERICA)	36956 (2013/14: 60.0% girls)	12 to 17							27.2*	24.9*	25.8*	WHO	
Roberto et al. (2024)[87]	Florianópolis, SC	1396 (2018;19; 53.5% girls)	7 to 14							37.8*	29.3*	33.0*	WHO	

Note. *: prevalences summed by reviewers from absolute data provided in the article; #: grouping of obesity and severe obesity; ¥: prevalences calculated from provided data stratified by age. †: data are presented by age (7 to 10 and 11 to 14 – 2002 survey only data from 7 to 10 years), prevalences were calculated from absolute values.

Table 1. Continued...

Cross-sectional studies														
Author/Year	**Location**	**Sample (date of collection; % girls)**	**Age**	**Overweight**			**Obesity**			**Excess weight**			**Cutoff**	**Statistical analysis**
				Boys	**Girls**	**Total**	**Boys**	**Girls**	**Total**	**Boys**	**Girls**	**Total**		
Rocha et al.(2023)[88]	Brasil (PeNSE)	16556 (2015; 49.2% girls)	11 to 19							24.6	25.9	25.2	WHO	Poisson regression
Rocha Silva et al. (2022)[89]	Teixeira de Freitas, BH	563 (2018; 49.4% girls)	6 to 10							20.0	26.6	23.3	WHO	
Santana et al. (2022)[90]	Niterói, RJ	291 (Data not reported; 50.2% girls)	13 to 15							31.7	29.4	30.6	WHO	MANCOVA
Santos et al. (2022)[91]	São Caetano do Sul, SP	402 (2012/13; 50.2% girls)	9 to 11	18.0*	23.8*	20.9*	21.5*	12.9*	17.2*				WHO	Linear regression
Santos et al. (2023)[92]	Vitória de Santo Antão, PE	160 (2017/18; 47.5% girls)	7 to 10	17.9*	23.7*	20.6	20.2*	11.8*	16.3				WHO	Kruskal-Wallis
Sbaraini et al. (2020)[93]	Brasil (ERICA)	37892 (2013/14; Not reported)	12 to 17	16.6	17.8	17.2	7.4#	6.3#	6.9#				IOTF	
Schwertner et al. (2020)[94]	Florianópolis, SC	330 (Data not reported; 74.0% girls)	15 to 18	26.7	14.3	17.6	7.0	4.9	5.5				IOTF	
Silva et al. (2020)[95]	Brasil (ERICA)	71740 (2013/14: 49.8% girls)	12 to 17	16.6	17.5		9.2	7.6					WHO	Poisson regression
Simões et al. (2020)[96]	São Luís, MA	2515 (2016; 52.4% girls)	18 to 19	13.0	16.0	14.6	4.8	7.1	6.0				WHO	Chi-square
Tebar et al. (2020)[97]	Brasil (PeNSE)	15436 (2015; 55.4% girls)	11 to 17	17.5*	17.5*	18.3	7.4*	5.7*	6.8				IOTF	
Torquist et al. (2022)[98]	Santa Cruz do Sul, RS	1252 (2011/12; 54.7% girls)	7 to 17							46.0*	54.7*	50.8*	CDC	
Tozo et al. (2022)[99]	São José dos Pinhais, PR	118 (Data not reported; 63.6% girls)	11 to 17							39.5*	36.0*	37.3*	WHO	
Vale et al. (2022)[100]	Brasil (PeNSE)	16409 (2015; Not reported)	10 to 19	15.7	17.6		10.5#	9.4#					WHO	Cluster
Wagner et al. (2021)[101]	Florianópolis, SC	2506 (2012/13; 56.5% girls)	7 to 14							36.9*	29.4*	34.2	WHO	Logistic regression
Zaccarelli-Marino et al. (2020)[102]	Santo André, SP	2757 (2011/12; 51.3% girls)	10 to 19	15.3*	20.3*	17.9	9.8*	9.0*	9.4				WHO	
Secular trend studies														
Author/Year	Location	Sample (date of collection; % girls)	Age	Overweight			Obesity			Excess weight			Cutoff	Statistical analysis
				Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total		
Damascena et al. (2022)[31]	Salvador, BA	392 (2001; 49.5% girls); 1490 (2009; 57.0% girls) 591 (2017; 65.1% girls)	10 to 18							15.1 16.2 32.5	15.5 14.1 30.4	15.3 15.0 31.1	WHO	Pooled OLS Regression
de Souza et al. (2024)[25]	Florianópolis, SC	563 (2007; 61.1% girls) 970 (2017/18; 48.8% girls)	14 to 19							12.8 18.5	9.9 14.4	11.1 16.5	IOTF	Logistic regression

Note. *: prevalences summed by reviewers from absolute data provided in the article; #: grouping of obesity and severe obesity; ¥: prevalences calculated from provided data stratified by age. †: data are presented by age (7 to 10 and 11 to 14 – 2002 survey only data from 7 to 10 years), prevalences were calculated from absolute values.

Table 1. Continued...

Cross-sectional studies														
Author/Year	**Location**	**Sample (date of collection; % girls)**	**Age**	**Overweight**			**Obesity**			**Excess weight**			**Cutoff**	**Statistical analysis**
				Boys	**Girls**	**Total**	**Boys**	**Girls**	**Total**	**Boys**	**Girls**	**Total**		
Matsuo et al. (2022)[26]	Florianópolis, SC	838 (2007); 688 (2012); 326 (2018/19) (100% girls)	10 to 14								21.3# 27.2# 28.5#		WHO	
Matsuo et al. (2022)[27]	Florianópolis, SC	2215 (2007; 52.3% girls); 1614 (2012/13; 57.7% girls)	9 to 14							34.4 37.4	21.1 28.8	27.4 32.4	WHO	Kruskal-Wallis
Portes et al. (2024)[29]	São Paulo, SP	339 (2006; 36.6% girls); 610 (2016; 51.5% girls)	6 to 10	11.0 12.0	14.0 13.0		25.0 27.0	23.0 25.0					WHO	
Santana et al. (2021)[30]	Duque de Caxias, RJ	511 (2005; 50.7% girls); 314 (2010; 49.0% girls)	12 to 18.9							22.2¥ 35.1¥	24.7¥ 27.0¥		WHO	Logistic regression for complex samples
Spanholi (2024)[28]	Florianópolis, SC	2936 (2002; 49.0% girls); 2826 (2007; 51.3% girls); 2469 (2012/13; 56.4% girls); 1544 (2018/19; 53.0% girls)	7 to 14	21.0 21.9* 21.9* 22.6*	19.3 18.5* 19.4* 20.6*		11.9 12.2* 16.0* 15.7*	8.3 6.3* 9.6* 9.0*					WHO	Logistic regression
Spanholi (2024)[28]	Florianópolis, SC	2936 (2002; 49.0% girls); 2826 (2007; 51.3% girls); 2469 (2012/13; 56.4% girls); 1544 (2018/19; 53.0% girls)	7 to 14†	16.0 19.2* 19.0* 18.0*	15.1 14.8* 17.2* 17.4*		5.0 6.1* 8.0* 8.3*	5.1 3.9* 6.1* 6.0					IOTF	Logistic regression
Longitudinal studies														
Author/Year	Location	Sample (date of collection; % girls)	Age	Overweight			Obesity			Excess weight			Cutoff	Statistical analysis
				Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total		
Santos et al. (2024)[32]	Pelotas, RS	2722 (2004; 2008, 2010 e 2015) 49.4% girls)	At 6 At 11 At 18							35.5 47.9 28.4	37.3 42.1 39.1		WHO	Logistic regression

Note. *: prevalences summed by reviewers from absolute data provided in the article; #: grouping of obesity and severe obesity; ¥: prevalences calculated from provided data stratified by age. †: data are presented by age (7 to 10 and 11 to 14 – 2002 survey only data from 7 to 10 years), prevalences were calculated from absolute values.

Concerning the period of data collection (pre- and post-COVID-19), 80.5% (n = 66) of the included studies presented data collected before the pandemic. An additional 15.9% (n = 13) did not report the assessment period, whereas only 2.4% (n = 2) presented post-pandemic data[22,23]. Finally, 1.2% (n = 1) included both pre- and post-pandemic data but did not conduct analyses reporting prevalences according to the period[24].

Risk of bias

The results of the risk of bias assessment of the studies included in this review are available in Supplementary Table 1. Among the cross-sectional and secular trend studies, scores ranged from 4 to 9 points. The only longitudinal study included in the review achieved a score of 13 points in the risk of bias assessment.

Prevalences: cross-sectional studies

In the present review, 74/82 studies reported prevalences of overweight and obesity using a cross-sectional design. Overall, the mean prevalence in the total sample was 18.4% for overweight and 10.6% for obesity. Additionally, the mean prevalence of excess weight (overweight + obesity) was 29.7%. The observed ranges across the included studies were 11.6% to 31.2% for overweight, 0.0% to 31.7% for obesity, and 15.3% to 56.2% for excess weight.

When stratified by sex, boys presented a mean prevalence of 18.3% for overweight, 11.2% for obesity, and 31.9% for Excess weight, with ranges of 6.8% to 35.7% for overweight, 0.0% to 33.3% for obesity, and 16.4% to 66.7% for Excess weight. Among girls, the mean prevalences were 18.1% for overweight, 9.7% for obesity, and 29.9% for Excess weight, with ranges of 5.3% to 31.0% for overweight, 0.0% to 30.3% for obesity, and 14.3% to 54.7% for Excess weight.

For children, considering cross-sectional data only (18/74), the mean prevalence of Excess weight was 35.3%. The mean prevalences of overweight and obesity were 18.3% and 16.5%, respectively. The overall range of variation was 12.7% to 31.2% for overweight, 5.2% to 31.7% for obesity, and 23.3% to 56.2% for Excess weight. When stratified by sex, mean prevalences among boys were 17.9% for overweight, 19.3% for obesity, and 37.9% for Excess weight, with ranges of 11.1% to 35.4%, 5.6% to 33.3%, and 16.4% to 66.7%, respectively. Among girls, mean prevalences were 18.8% for overweight, 13.9% for obesity, and 34.1% for Excess weight, with ranges of 9.8% to 25.0% for overweight, 4.8% to 30.3% for obesity, and 22.5% to 54.5% for Excess weight.

Considering cross-sectional data among adolescents only (60/74), the mean prevalence was 18.5% for overweight, 8.5% for obesity, and 28.5% for Excess weight. The observed ranges were 11.6% to 30.0% for overweight, 0.0% to 17.6% for obesity, and 15.3% to 54.6% for Excess weight. When stratified by sex, boys presented mean prevalences of 18.4% for overweight, 9.2% for obesity, and 29.5% for Excess weight, with ranges of 6.8% to 35.7%, 0.0% to 20.8%, and 16.4% to 52.4%, respectively. Girls showed mean prevalences of 18.1% for overweight, 8.4% for obesity, and 28.0% for Excess weight, with ranges of 5.3% to 31.0% for overweight, 0.0% to 19.0% for obesity, and 14.3% to 47.6% for Excess weight.

Regional analyses indicated that the highest mean prevalences of Excess weight were observed in the Midwest region, reaching 66.7% among boys and 40.6% among girls. The other regions showed lower prevalences, following a decreasing order among boys: South (32.7%; 30.6% among girls), Southeast (32.5%; 30.3% among girls), Northeast (32.3%; 30.3% among girls), and North (25.0%; 26.0% among girls). In contrast, when considering nationally representative data, the mean prevalences of Excess weight were 32.5% among boys and 30.1% among girls (Figure 2).

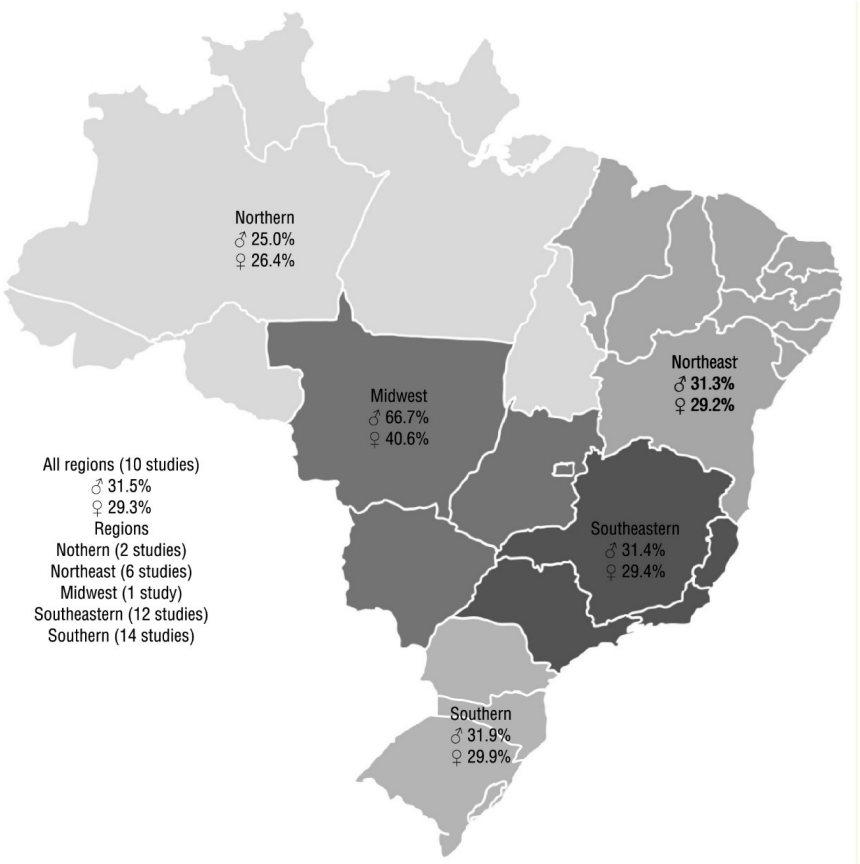

Figure 2. Mean prevalence of Excess weight among Brazilian youths according to sex and geographic region

Secular trends

Seven of the 82 included studies focused primarily on secular trends and reported prevalences of overweight/obesity among youths (Table 1). Information regarding differences between the periods analyzed in these studies is presented in Table 1. Regarding geographic distribution, 4/7 studies were conducted in the South region[25-28], 2/7 in the Southeast[29,30] and 1/7 in the Northeast[31]. Of the seven studies, three reported Excess weight data for the total sample, all indicating a positive secular trend[25,27,31]. Another study showed that youths assessed in 2018/19 had higher odds of overweight and obesity compared with those assessed in 2002[28].

When stratified by sex, 6/7 studies reported separate data for boys and girls[25,27-31], while one study presented data only for girls[26]. Of these, 6/7[25-28,30,31] studies included adolescent samples and 2/7 included children[28,29].

Among adolescent boys, most studies (4/5) reported a null secular trend for overweight, obesity, or Excess weight[25,27,28,30], with only one study reporting a positive secular trend for Excess weight[31]. Notably, in the study by Spanholi et al.[28], a positive trend for overweight was observed among boys when using IOTF cutoff points, but a null trend was found when WHO criteria were applied. Among adolescent girls, 4/6 studies observed a positive secular trend for overweight, obesity, or Excess weight[26-28,31], whereas 2/6 studies reported a null trend[25,30]. Only 2/7 studies provided data for children, both showing a null secular trend among girls[28,29]. Among boys, the study by Spanholi et al.[28], reported a positive trend only for *obesity*, while the study by Portes et al.[29] observed a null secular trend.

Longitudinal data

Among the included studies, only 1/82 with a longitudinal design met the eligibility criteria of this review (Table 1). In this study, the prevalences of Excess weight were 35.5% among boys and 37.3% among girls at 6 years of age, decreasing to 24.8% among boys and increasing slightly to 39.1% among girls at 18 years of age. However, the authors did not perform statistical comparisons between the different assessment time points[32].

Associated factors

Information on associated factors and groups at higher risk of exposure to overweight and obesity is presented in Table 2.

Table 2. Description of secular trends and associated factors related to overweight and obesity in children and adolescents

Study	Results
Barros[36]	Greater adherence to the "coffee with bread" dietary pattern (white bread, coffee, fats, and eggs) and the "common Brazilian pattern" (white rice, beans, meat, and pasta) was associated with lower odds of Excess weight compared with lower adherence to these patterns.
Blaudt[37]	Higher levels of the Dietary Inflammatory Index were associated with greater odds of Excess weight in both sexes compared with adolescents with lower index scores.
Bricarello[38]	Higher prevalences of Excess weight were observed among younger boys (12–14 years), White adolescents, those attending private schools, and those engaging in ≥300 minutes of physical activity per week. No association was observed between the DASH (Dietary Approaches to Stop Hypertension) diet score and Excess weight among adolescents.
Caixeta and Amato[40]	Lower maternal education, being born small for gestational age, higher maternal BMI, and longer screen time were associated with Excess weight.
Damascena[31]	A positive secular trend in BMI was observed between 2001 and 2017, with greater increases among girls and older adolescents (14 to 18 years) compared with boys and younger adolescents (10 to 14 years), respectively.
de Almeida Alves[51]	Adolescents with greater adherence to the "traditional Brazilian" dietary pattern, characterized by the consumption of beans, rice, and meat, had lower odds of Excess weight, suggesting a protective effect of this pattern. No association was observed between the "unhealthy" dietary pattern and Excess weight.
de Souza[25]	In 2017/2018, boys who spent more than 4 hours per day in screen-based activities, those with adequate muscular strength, and those with inadequate cardiorespiratory fitness had a higher probability of presenting Excess weight, whereas adolescents with adequate cardiorespiratory fitness had a lower probability compared with adolescents assessed in 2007. Girls with adequate handgrip strength showed a higher probability of Excess weight in 2017/2018, while girls with adequate cardiorespiratory fitness had a lower probability compared with those assessed in 2007.

Table 2. Continued...

Study	Results
dos Santos[54]	Alcohol consumption, living in rented or granted housing, self-perception as obese, being aged 10–14 years, and low food security were associated with a higher prevalence ratio of Excess weight.
Ferreira and de Andrade[6]	A positive association was observed between better socioeconomic conditions and Excess weight.
Lima[66]	Attending private schools, being a younger adolescent (12 to 14 years), having post-pubertal sexual maturation, a higher number of televisions in the household, "sometimes having breakfast," "sometimes purchasing snacks at the school cafeteria," "never or sometimes eating snacks in front of screens," and carbohydrate and lipid intake below the median were positively associated with Excess weight.
Lima[67]	Male sex and younger age (11 to 14 years) were positively associated with Excess weight.
Lock[68]	A higher proportion of individuals with obesity was observed with increasing maternal education and socioeconomic status.
Lourenço[69]	Having a home garden or orchard was positively associated with Excess weight.
Marques[75]	Among girls, high polyvictimization was associated with higher odds of overweight. When considering the type of violence, school violence was associated with higher odds of obesity. No significant associations were observed among boys.
Marques[76]	Among girls, sexual abuse was positively associated with overweight and obesity. Among boys, sexual abuse was not associated with overweight or obesity, but was associated with underweight.
Matsuo[27]	A null secular trend for Excess weight was observed among boys. Nevertheless, boys consistently showed higher prevalences of Excess weight compared with girls over the years. A positive secular trend for Excess weight was observed among girls, with a 26.5% increase in prevalence (from 21.1% in 2007 to 28.8% in 2012/13).
Arruda Neta[80]	Screen time and the combination of high screen time with low consumption of healthy foods increased the likelihood of Excess weight among adolescents.
Portella[82]	Boys with obesity, compared with those with normal weight, showed poorer performance in the 20-m run and standing long jump, but better performance in the medicine ball throw. Girls with overweight and obesity, compared with those with normal weight, showed better performance in the medicine ball throw and standing long jump.
Rocha[88]	Skipping breakfast was associated with higher odds of Excess weight.
Santana[30]	A null secular trend was observed among boys overall. When age groups were considered separately, a positive secular trend for Excess weight was observed among younger boys (12 to 14.9 years). A null secular trend for Excess weight was observed among girls.
Santana[90]	Anxiety and depression did not influence BMI or physical activity levels.
Santos[32]	No association was observed between mental health indicators and BMI or Excess weight among boys. Among girls, externalizing disorders at 6 and/or 11 years of age were associated with higher BMI at 18 years and higher odds of Excess weight.
Santos[91]	Maternal BMI and birth weight were positively associated with higher BMI values in children.
Santos[92]	Children with obesity, compared with those with normal weight, tended to take larger bites, perform fewer chewing sequences, and finish meals in less time. In addition, they ate faster than children with overweight.
Silva[95]	Among boys, having dinner almost every day or every day with parents or caregivers reduced the odds of obesity. When stratified by age, only having dinner every day remained associated among younger boys (12–14 years). No association was observed among girls.
Simões[96]	Girls showed higher prevalences of overweight and obesity than boys.

Table 2. Continued...

Study	Results
Spanholi[28] (WHO criteria)	Using WHO cutoff points, a null temporal trend for *overweight* was observed regardless of sex and school type, whereas a positive temporal trend for *obesity* was identified, with a 44% increase between 2002 and 2018/19 in the total sample. Over the same period, increases of 36% and 38% were observed among boys and girls attending public schools, respectively.
Spanholi[28] (IOTF criteria)	Using IOTF cutoff points, a positive temporal trend for overweight and obesity was observed between 2002 and 2018/19, with total increases of 19% and 72%, respectively. Over the same period, increases of 64% and 68% were observed among boys and girls attending public schools, respectively. In both sexes attending private schools, a 66% increase in obesity was observed.
Vale[100]	The profiles characterized as "dietary pattern with higher nutritional risk associated with overweight or obesity" were associated with female adolescents residing in the South and Southeast regions, attending public and urban schools, living in households with fewer than five residents, having mothers with completed secondary education, irregular breakfast consumption, irregular family meals, and reporting the use of formulas or laxatives for weight control.
Wagner[101]	In the final model, among children, lower odds of Excess weight were observed among those who were breastfed up to six months, among girls, and among those with birth weight ≤2,999 g. Higher odds of Excess weight were observed among children whose mothers had pre-obesity or obesity. Among adolescents, lower odds of Excess weight were observed among girls, whereas higher odds were observed among offspring of older mothers with pre-obesity or obesity, as well as among those with late sexual maturation.

Sociodemographic factors

Higher prevalences of Excess weight were observed among adolescents enrolled in private schools located in urban and central areas, particularly among younger adolescents (12 to 14 years) and those in the post-pubertal stage, in both sexes[38,42,66,67].

Better socioeconomic conditions, such as higher maternal education, a greater number of televisions in the household, and higher economic status, were associated with Excess weight[6, 54]. Conversely, living in rented or granted housing and having lower maternal education increased the likelihood of Excess weight[40,54]. Evidence also pointed to regional differences, with adolescents residing in the South and Southeast regions presenting higher odds of Excess weight[100]. In addition, living in households with fewer than five residents was associated with nutritional risk profiles and Excess weight[100].

Hereditary/genetic factors

Excess weight was more frequent among children of mothers with overweight, obesity, or advanced maternal age[32,101]. In addition, birth weight was positively associated with BMI[32], while children born small for gestational age showed a higher likelihood of Excess weight[40].

Behavioral and physical factors

Excess weight was associated with longer screen time (≥4 h/day), particularly when combined with low consumption of healthy foods[25,80].

Studies on dietary patterns indicated that skipping breakfast, having breakfast only occasionally, and eating meals in front of the television increased the likelihood of Excess weight[66, 88,100]. Altered eating behaviors, such as eating quickly and reduced chewing, were also observed among children with obesity[92]. Moreover, pro-inflammatory or high-risk dietary patterns increased the probability of Excess weight, whereas traditional patterns, such as rice, beans, and meat, showed a protective effect[35,37,51]. Having dinner with parents was a protective factor among boys, particularly younger ones[95].

Psychosocial factors, including negative body image, use of laxatives for weight control, and a history of violence (sexual abuse, polyvictimization, and school violence), were associated with overweight and obesity, especially among girls[54,75,76,100].

Associations between physical fitness and Excess weight were heterogeneous: inadequate muscular strength and cardiorespiratory fitness were positively associated with the outcome, although girls with adequate muscular strength also showed a higher likelihood of Excess weight[25].

DISCUSSION

The prevalences of overweight and obesity among Brazilian children and adolescents ranged from 11.6% to 31.2% and from 1.7% to 31.7%, respectively, while the prevalences of excess weight ranged from 19.3% to 56.2%. The prevalences of overweight, obesity, and excess weight also varied according to age group (children vs. adolescents), sex, and geographic region. Although weight status is a widely investigated indicator, it is important to highlight that the use of different cut-off points for the classification of overweight and obesity (WHO, IOTF, and CDC) requires caution when interpreting the prevalence estimates reported in this review.

When comparing the findings of the present systematic review (studies published between 2020 and 2024) with those of a previous systematic review that compiled data from studies published between 2018 and 2019[18], an increase in the prevalences of overweight and obesity was observed among children and adolescents overall (overweight: 8.8% to 22.2% vs. 11.6% to 31.2%; obesity: 3.8% to 24% vs. 1.7% to 31.7%), as well as when stratified by sex (boys - overweight: 6.2% to 21% vs. 6.8% to 35.7%; obesity: 2.4% to 28.9% vs. 0% to 33.3%; girls - overweight: 6.9% to 27.6% vs. 5.3% to 29.1%; obesity: 1.6% to 19.4% vs. 0% to 30.3%). Although obesity is a multifactorial disease, the increase in the prevalences of overweight and obesity among children and adolescents may be attributed to changes in lifestyle factors, such as increased sedentary behavior[103], reduced physical activity[104,105] and increased consumption of ultra-processed foods[106].

With respect to age groups, the prevalences of overweight were similar between children and adolescents; however, obesity prevalences were higher among children (5,2% to 31,7%) compared with adolescents (1,7% to 17,6%). These declines in obesity from childhood to adolescence have been observed globally and may be related both to hormonal changes that occur during growth and puberty and to greater concern with body weight control in order to conform to perceived social body standards[107].

Regarding geographic region, the lowest prevalences of excess weight were observed in the North region, intermediate and similar prevalence ranges were

found in the South, Southeast, and Northeast regions, while the Midwest region presented the highest prevalences. These regional prevalences should be interpreted with caution, as the number of studies conducted in the North (n = 2) and Midwest (n = 1) regions was considerably lower than in other regions. In addition, one study included in this review, using data from the Brazilian National School Health Survey, found that excess weight prevalences among adolescents in the Midwest region (27.9%) were closer to those observed in the Southeast (27.8%) and South (31.1%)[100]. Thus, higher prevalences of excess weight in these regions may be related to greater economic development compared with other regions of the country[6].

Regarding associated factors, the findings reinforce the perspective that overweight and obesity are multifactorial phenomena resulting from the interaction of sociodemographic, hereditary, behavioral, and psychosocial factors. Understanding these multiple dimensions is essential to inform interventions in a context marked by rapid nutritional transition.

The relationship between socioeconomic status (SES) and excess weight showed a dual pattern. Adolescents from families with better socioeconomic conditions and higher maternal education had a higher likelihood of overweight and obesity[6,68], possibly due to greater availability of energy-dense foods, higher screen exposure, and reduced daily physical activity[40,67]. In contrast, indicators of vulnerability, such as low maternal education and living in rented or borrowed housing, were also associated with excess weight[54]. These findings reflect a pattern typical of middle-income countries, in which both high and low SES contribute to excess weight through distinct mechanisms: caloric abundance among higher-income groups and greater reliance on low-cost ultra-processed foods among more vulnerable populations[108].

The results also demonstrated a strong influence of hereditary factors and perinatal conditions. The higher prevalence of excess weight among children born to mothers with overweight or obesity reinforces the interaction between genetic predisposition, family environment, and intrauterine exposure[91]. Findings by Nogues et al.[109] showed that maternal obesity is associated with downregulation of leptin and adiponectin systems in the term placenta, resulting in loss of the protective effects of these adipokines on placental development, potentially compromising key mechanisms involved in fetal growth and metabolism. Regarding the increased risk of excess weight among children born small for gestational age[40,91], this association may be explained by reduced insulin sensitivity, reflected by higher fasting serum insulin levels[110].

Sedentary behavior has been widely recognized as a major determinant of youth obesity, not only due to lower energy expenditure but also because of its association with greater exposure to media and subsequent consumption of calorie-dense foods during screen use[40,80]. In addition, unhealthy eating behaviors, including skipping breakfast, eating meals in front of the television, and eating quickly, were associated with higher odds of excess weight[66,88,92]. Skipping meals may promote dysregulation of metabolic homeostasis, leading to greater total caloric intake as compensation[111], whereas distracted eating may impair physiological hunger–satiety mechanisms, resulting in increased food intake[112].

Dietary patterns were shown to exert a substantial influence. Pro-inflammatory diets or those characterized by a predominance of ultra-processed foods[36,37] increased the likelihood of excess weight, whereas the traditional Brazilian dietary pattern, comprising rice, beans, and meat, demonstrated a protective effect[51,100].

Additionally, having dinner with family members was identified as a protective factor, which may reflect the role of family structure and parental supervision in shaping healthy behaviors[95], For this reason, the Brazilian Dietary Guidelines encourage regular meal times, eating in the company of family and friends, greater consumption of fresh or minimally processed foods, and the development of culinary skills among children and adolescents[113].

In the psychosocial domain, obesity during adolescence appears to extend beyond biological and behavioral dimensions, also reflecting emotional and social vulnerabilities. Stress resulting from exposure to violence and low self-esteem may trigger dysfunctional eating behaviors and neuroendocrine alterations that favor adiposity[32,100].

Regarding physical fitness, both low muscular strength and low cardiorespiratory fitness were associated with excess weight, as reported in recent studies[25]. From a physiological perspective, lower levels of muscular strength reflect reduced lean soft tissue[114,115], which decreases basal energy expenditure and favors weight gain. Likewise, reduced cardiorespiratory fitness may indicate lower efficiency in oxygen utilization as well as lower levels of physical activity[116,117].

Some limitations should be considered. Most studies were conducted in the more developed regions of the country, in addition to the limited number of studies performed in other regions. The use of different cut-off points to classify overweight and obesity may limit the interpretation of combined prevalence estimates and comparisons across regions. Furthermore, heterogeneity related to sample selection criteria and measurement standardization among evaluators should also be acknowledged. The limited number of studies conducted after the COVID-19 pandemic prevents a robust interpretation of the true impact of this period on the prevalences of overweight and obesity among Brazilian youth. Although all studies were published during or after the pandemic, the data underlying most investigations included in this systematic review were predominantly collected before this period. This practice is common in scientific research due to the time required to complete analyses, prepare manuscripts, and finalize the publication process. Nevertheless, due to this limitation, the findings should be interpreted as complementary to previous reviews rather than as a fully representative update of the post-pandemic scenario.

CONCLUSION

Based on the evidence synthesized in this systematic review, the prevalences of overweight and obesity among Brazilian children and adolescents remain alarmingly high. Moreover, no declining trend in these indicators was observed, underscoring the urgency of implementing strategies that promote behavioral change. Such actions should prioritize the adoption of healthier lifestyles among children and adolescents, along with the active involvement of their families. Furthermore, there is a clear need for intersectoral public policies integrating schools, communities, and health services to expand the reach of interventions and reduce inequalities that influence this scenario. Finally, strengthening continuous monitoring systems is recommended, as they are essential for tracking prevalence trends and informing future prevention strategies.

COMPLIANCE WITH ETHICAL STANDARDS

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Data Availability Statement

The data that support the findings of this study are available from the corresponding author, upon reasonable request.

Ethical approval

This research is in accordance with the standards set by the Declaration of Helsinki.

Conflict of interest statement

The authors have no conflict of interests to declare.

Author Contributions

Conception: JCPDM, CCM, AP; Planning: JCPDM, CCM, AP; Data analysis: JCPDM, NNJ, CCM, GWN, MAB, TRL, AP; Critical review of the article: JCPDM, NNJ, CCM, GWN, MAB, TRL, AP; Writing of the article: JCPDM, CCM, MAB; Review of the article: JCPDM, NNJ, GWN, TRL, AP. All authors read and approved the final version of the manuscript.

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SUPPLEMENTARY MATERIAL

Supplementary material accompanies this paper.

Supplementary File 1. Analysis of the risk of bias in the studies: Free access in https://osf.io/gr3cb/

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