

Sports participation among Brazilian adolescents and children: systematic review

Participação esportiva entre adolescentes e crianças brasileiras: revisão sistemática

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Abstract – The aim of this study is to describe the prevalence of sports participation in Brazilian children and adolescents through a systematic literature review. A search was carried out in the following electronic databases: MEDLINE, WEB OF SCIENCE, BIREME, SCIELO, and SCOPUS for manuscripts published until 2020, combining the keywords: “children”, “adolescents”, “prevalence”, and “sports participation”, in Portuguese and English. Twenty-six articles published between 2003 and 2020 were included in the review, with the aim of estimating the prevalence of participation in organized sports in Brazilian children and adolescents. Considering the regions where the studies were carried out, the majority were developed in the south (57.7%; n=15), followed by the southeast (19.2%; n=05), and northeast (15.4%; n=04), in addition to 7.7% (n=02) in all regions of the country. The data showed prevalence of sports participation ranging from 15.0% to 73.2% (mean of 44.8%) among children and adolescents, being higher in males (63.1%). From the results found, the need to develop public policies is evident, in order to favor adherence and maintenance of young people to sports practice, especially among those of the female sex.

Keywords: Adolescent behavior; Child; Epidemiology; Sports.

Resumo – O objetivo deste estudo foi descrever a prevalência de participação esportiva em crianças e adolescentes brasileiros por meio de uma revisão sistemática de literatura. A busca foi realizada nas seguintes bases de dados eletrônicas: MEDLINE, WEB OF SCIENCE, BIREME, SCIELO e SCOPUS de manuscritos publicados até o ano de 2020, por meio da combinação das palavras-chave: “crianças”, “adolescentes”, “prevalência” e “participação esportiva”, em português e inglês. Foram incluídos na revisão 26 artigos publicados no período de 2003 a 2020, com objetivo de estimar a prevalência de crianças e adolescentes brasileiros acerca da participação em esportes organizados. Quanto a região de realização do estudo, a maioria foi desenvolvido no sul (57.7%; n=15), seguido do sudeste (19.2%; n=05) e nordeste (15.4%; n=04), além de 7.7% (n=02) em todas as regiões do país. Os dados mostraram prevalências de participação esportiva que variaram entre 15.0% a 73.2% (média de 44.8%) entre crianças e adolescentes, sendo superior no sexo masculino (63.1%). A partir dos resultados encontrados evidenciou-se a necessidade do desenvolvimento de políticas públicas para favorecer a aderência e manutenção de jovens para a prática esportiva, principalmente entre aqueles do sexo feminino.

Palavras-chave: Comportamento do adolescente; Criança; Epidemiologia; Esportes.

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INTRODUCTION

Physical activity is an important health-related behavior in different age groups, including children and adolescents¹, as it is associated with beneficial health effects². Recent data from a literature review identified a low estimate of global physical activity among children and adolescents³. This raises concerns on the part of public health agencies in particular, as low levels of physical activity are a risk factor for the development of many chronic diseases, not only in childhood and adolescence but also in adult life⁴, resulting in higher expenses for the Brazilian public health system⁵.

In view of the above, to increase the levels of physical activity in children and adolescents, participation in organized sports has been shown to be a good strategy, due to greater engagement on the part of this age group, contributing to an increase in energy expenditure⁶ and improving the physical fitness of young people⁷. In addition, it should be noted that the sports practice environment is an important context for the development of identity, emotions, psychological skills, and social relationships⁸.

Therefore, carrying out studies focused on the subject in question makes it possible to draw up a profile of sports practice in Brazilian children and adolescents to serve as a basis for the elaboration of actions with a view to greater engagement in this age group.

In view of the above, the objective of the present study was to describe the prevalence of sports participation in Brazilian children and adolescents through a systematic review of the literature.

METHOD

Search strategies

In the present review, sport participation was considered a subset of structured physical activity, being goal-oriented and competitive. For the development of the review, standardized protocols were followed⁹, according to the registration in PROSPERO under number: PROSPERO 2021 CRD42021236338. The search was conducted in the databases, Medline, Web of Science, Bireme, Scielo, and Scopus from August to December 2021 by three authors independently. The search strategies included the combination of the following descriptors in English and Portuguese, when requested; children, teenagers, prevalence, sports, Brazil. The Boolean operators “or” and “and” were used for intra-group and inter-group combinations, respectively.

Identification of eligible studies

The initial search was carried out by three independent reviewers, from the reading of the titles. In case of doubts about the inclusion of a certain article, the abstract was read. After this step, two other reviewers evaluated the articles in full from the establishment of the inclusion criteria. A third reviewer was requested when there was a lack of agreement between the first two.

Selection criteria

As inclusion criteria to enter the review, the following were considered: I) original cross-sectional, cohort, or intervention studies published without peer-reviewed journals; II) present the prevalence of sports participation in Brazilian children and adolescents; III) samples with Brazilian children and adolescents aged 0 to 18 years (or a mean age within these ranges or separate data for individuals in this age group).

Data extraction and synthesis

After selecting the studies, the following information was extracted; year of publication, study location, total sample and stratified by sex, age group, and study design, as well as the prevalence of general sports participation and by sex. The quality of the studies was independently assessed by two reviewers using a risk of bias tool utilized in prevalence studies. This instrument consists of ten items, organized as follows; items one to four assess the external validity, and from five to ten the internal validity of the study¹⁰.

The results were arranged into three tables in alphabetical order, the first with methodological aspects, the second with data on sports participation, and the third with information on the methodological qualification of the articles.

RESULTS

From the initial search, 7646 articles were retrieved, which were evaluated by titles and abstracts and, after excluding duplicate articles and those with topics unrelated to the objective of the present study, 68 articles were read in full. Of these, 42 were excluded for not presenting prevalence of sports participation. Finally, 26 met all inclusion criteria and were included in the systematic review (Figure 1)¹¹⁻³⁶.

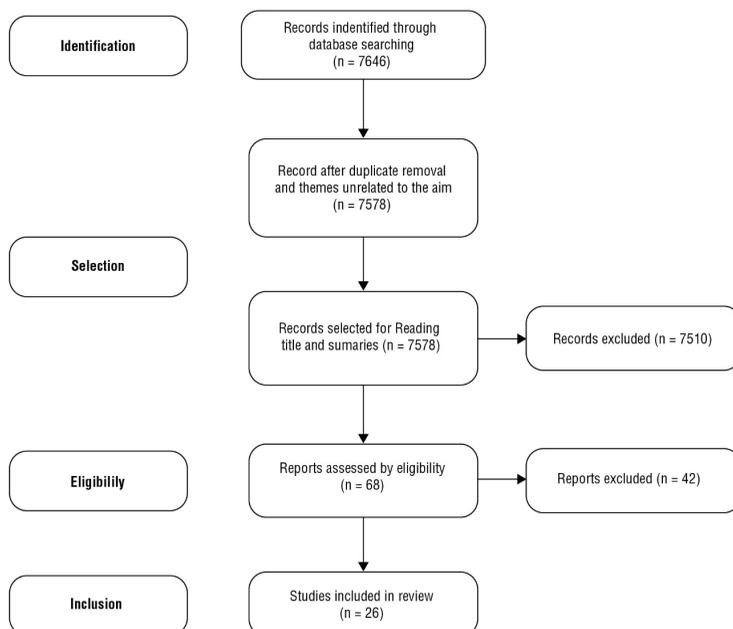


Figure 1. Flowchart of the systematic review.

The data presented in Table 1 show that from 2014 onwards, there was an increase in the number of studies aimed at identifying the prevalence of sports participation in children and adolescents. The majority of studies were developed in the Southern region (n=13; 50.0%), followed by the Southeast (n= 05; 19.2%), and Northeast (n= 04; 15.4%), as well as studies with national sampling (n= 2; 7.7%). Regarding the number of young people evaluated, the majority of studies considered a sample of more than 600 (n= 20; 76.9%), mainly adolescents (n= 21; 80.8%). The table also shows that of the 26 studies included, 24 (92.3%) had a cross-sectional design.

Table 1. General data on the selected studies (n= 26).

Studies	Year	Location	Sample size	Sample size boys/girls	Age range	Design
Bedendo and Noto ¹¹	2015	Brazil	13,872	5,714/7,906	14-18	Cross-sectional
Carlisle et al. ¹²	2019	Recife	320	n/s	10-16	Cross-sectional
Cayres et al. ¹³	2015	Presidente Prudente	120	n/s	11-14	Cross-sectional
Coledam et al. ¹⁴	2014	Londrina	827	377/450	10-17	Cross-sectional
Coledam and Ferraiol ¹⁵	2017	Londrina	737	427/450	10-17	Cross-sectional
Coledam et al. ¹⁶	2017	Londrina	753	357/396	10-17	Cross-sectional
Coledam et al. ¹⁷	2018	Londrina	729	223/505	10-17	Cross-sectional
da Costa et al. ¹⁸	2020	Florianópolis	999	485/514	11-15	Cross-sectional
Christofaro et al. ¹⁹	2015	Presidente Prudente and Londrina	3,494	1,622/1,872	10-18	Cross-sectional
Dutra et al. ²⁰	2015	Pelotas	616	n/s	08	Longitudinal
Fernandes et al. ²¹	2008	Presidente Prudente	1,495	812/942	11-17	Cross-sectional
Fernandes et al. ²²	2011	Presidente Prudente	1,161	469/692	11-17	Cross-sectional
Fernandes et al. ²³	2014	Presidente Prudente and Londrina	2,782	1,310/1,472	10-17	Cross-sectional
Ferreira et al. ²⁴	2019	Maringá	707	332/375	06-10	Cross-sectional
Lima et al. ²⁵	2016	Presidente Prudente	107	n/s	07-10	Longitudinal
Lima and Silva ²⁶	2019	São José	861	379/482	14-19	Cross-sectional
Magno et al. ²⁷	2020	Brazil	71,142	32,843/38,299	>15	Cross-sectional
Malcon et al. ²⁸	2003	Pelotas	1,187	575/612	10-19	Cross-sectional
Mendonça et al. ²⁹	2018	João Pessoa	2,859	1,206/1,653	16-19	Cross-sectional
Mendonça et al. ³⁰	2018	João Pessoa	2,350	1,045/1,291	16-19	Cross-sectional
Nunes and Silva ³¹	2019	São José	1,112	n/s	14-19	Cross-sectional
Ponce-Blandón et al. ³²	2020	Uruguaiana	470	216/254	09-10	Cross-sectional
Saes et al. ³³	2014	Rio Grande	625	284/341	06-18	Cross-sectional
Silva and dos Santos ³⁴	2015	Aracaju	2,243	836/1,377	13-18	Cross-sectional
Torres et al. ³⁵	2020	Presidente Prudente	260	182/78	11-18	Cross-sectional
Victo et al. ³⁶	2017	Ilhabela	413	219/194	11-18	Cross-sectional

The objective of the current systematic review was to seek information on the prevalence of sports participation in Brazilian children and adolescents, including studies published up to the year 2020. With respect to the prevalence found, the

data showed a variation between 15.0% and 73.2% (mean prevalence of 44.8%) among children and adolescents, being higher in males (63.1%) compared to females (35.4%) (Table 2).

Table 2. Prevalence of sports participation among children and adolescents (n = 26).

Studies	Year	Sports participation (girls[%])	Sports participation (boys [%])	Overall sports participation (%)
Bedendo and Noto ¹¹	2015	n/s	n/s	62.9
Carlisle et al. ¹²	2019	36.3	63.7	33.9
Cayres et al. ¹³	2015	43.1	56.5	50.0
Coledam and Ferraiol ¹⁵	2014	19.6	47.7	n/s
Coledam et al. ¹⁶	2017	37.6	71.6	35.0
Coledam et al. ¹⁶	2017	30.0	70.0	n/s
Coledam et al. ¹⁷	2018	20.8	51.0	35.7
da Costa et al. ¹⁸	2020	24.4	67.6	45.0
Christofaro et al. ¹⁹	2015	n/s	n/s	61.8
Dutra et al. ²⁰	2015	n/s	n/s	28.8
Fernandes et al. ²¹	2008	9.4	21.2	14.8
Fernandes et al. ²²	2011	43.6	63.3	n/s
Fernandes et al. ²³	2014	n/s	n/s	62.5
Ferreira et al. ²⁴	2019	n/s	n/s	28.0
Lima et al. ²⁵	2016	n/s	n/s	48.6
Lima et al. ²⁶	2019	n/s	n/s	32.6
Magno et al. ²⁷	2020	n/s	n/s	23.4
Malcon et al. ²⁸	2003	n/s	n/s	45.1
Mendonça et al. ²⁹	2017	n/s	68.6	44.5
Mendonça et al. ³⁰	2018	33.9	75.7	50.5
Nunes et al. ³¹	2019	63.1	85.2	73.2
Ponce-Blandón et al. ³²	2020	n/s	n/s	37.0
Saes et al. ³³	2014	n/s	n/s	53.5
Silva and dos Santos ³⁴	2015	n/s	n/s	42.3
Torres et al. ³⁵	2020	62.7	63.9	n/s
Victo et al. ³⁶	2017	43.5	77.7	61.5

Note. n/s – not shown in the study.

Regarding the evaluation of the quality of the studies, among the results obtained for items one to four, which relate to external validity, the majority adhered to the criteria, with the exception of item four in which 14 (53.8%) studies did not present information about sample losses. Considering items five to ten, indicative of internal validity, only two items were not met by more than half of the selected studies, with seven referring to the presentation of the validity of the instruments used (61.5%) and nine referring to the indication of a minimum period of sports practice (57.7%) (Table 3).

Table 3. Assessment of studies quality.

Studies	Questions									
	1	2	3	4	5	6	7	8	9	10
Bedendo and Noto ¹¹	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Carlisle et al. ¹²	No	No	No	No	Yes	Yes	No	Yes	No	Yes

Note. 1 - Was the sampling frame a true or close representation of the target population?; 2 - Was the population target presented?; 3 - Was some form of random election used to select the sample?; 4 - Was the likelihood of non-response bias minimal?; 5 - Were data collected directly from the subjects?; 6 - Was an acceptable case definition used in the study?; 7 - Was the study instrument that measured the parameter of interest shown to have reliability and validity?; 8 - Was the same mode of data collection used for all subjects?; 9 - Was the length of the shortest prevalence period for the parameter of interest appropriate?; 10 - Were the numerator(s) and denominator(s) for the parameter of interest appropriate?

Table 3. Continued...

Studies	Questions									
	1	2	3	4	5	6	7	8	9	10
Cayres et al. ¹³	Yes	No	No	No	Yes	Yes	No	Yes	Yes	Yes
Coledam et al. ¹⁴	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes
Coledam and Ferraiol ¹⁵	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes
Coledam et al. ¹⁶	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Coledam et al. ¹⁷	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Costa et al. ¹⁸	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Christofaro et al. ¹⁹	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Dutra et al. ²⁰	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Fernandes et al. ²¹	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fernandes et al. ²²	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Fernandes et al. ²³	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes
Ferreira et al. ²⁴	Yes	Yes	Yes	No	No	No	No	Yes	No	Yes
Lima et al. ²⁵	No	Yes	No	No	Yes	No	No	Yes	No	Yes
Lima and Silva ²⁶	Yes	Yes	Yes	No	Yes	No	No	Yes	No	Yes
Magno et al. ²⁷	Yes	Yes	Yes	Yes	No	No	No	Yes	No	Yes
Malcon et al. ²⁸	Yes	Yes	Yes	No	Yes	No	No	Yes	No	Yes
Mendonça et al. ²⁹	Yes	No	Yes							
Mendonça et al. ³⁰	Yes	No	Yes							
Nunes and Silva ³¹	Yes	Yes	Yes	No	Yes	No	No	Yes	No	Yes
Ponce-Blandón et al. ³²	Yes	Yes	Yes	No	Yes	No	No	Yes	No	Yes
Saes et al. ³³	Yes	Yes	No	Yes	Yes	No	No	No	Yes	Yes
Silva and dos Santos ³⁴	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Torres et al. ³⁵	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes
Victo et al. ³⁶	No	Yes	No	No	Yes	No	No	Yes	No	Yes

Note. 1 - Was the sampling frame a true or close representation of the target population?; 2 - Was the population target presented?; 3 - Was some form of random election used to select the sample?; 4 - Was the likelihood of non-response bias minimal?; 5 - Were data collected directly from the subjects?; 6 - Was an acceptable case definition used in the study?; 7 - Was the study instrument that measured the parameter of interest shown to have reliability and validity?; 8 - Was the same mode of data collection used for all subjects?; 9 - Was the length of the shortest prevalence period for the parameter of interest appropriate?; 10 - Were the numerator(s) and denominator(s) for the parameter of interest appropriate?

DISCUSSION

This systematic review aimed to describe the prevalence of sports participation among Brazilian children and adolescents, in order to assist in the indirect identification of the level of physical activity in this age group, since participation in organized sports among children and adolescents has been shown to represent a possibility for increasing physical activity levels among children and adolescents³⁷. From the reading of the 26 articles that make up the present review, the following findings can be observed: i) studies on the subject in children are still scarce; ii) there is no consensus on the criteria that define sports participation; iii) the average prevalence obtained was 44.8%, being higher in males.

In terms of the age group investigated, few studies were conducted in children. In general, this is due to the difficulty in evaluating sports practice in this age group, as well as the level of global physical activity³⁸. In addition, the need for parental involvement, especially among very young children, tends to make it difficult to carry out studies with this age group. Including the engagement of the child in the sport itself. According to Fernandes et al.²², child participation is greater when parents also practice a sport, especially mothers, since they tend

to be the closest figure to the child and, therefore, have a great influence on the formation and adoption of children's habits.

Regarding the evaluation of sports participation, self-reported questionnaires were the main tool used to measure the variable in question, due to their cost-benefit, efficiency, and ease of application on a large scale¹². However, the wide variety of criteria used to determine sports participation, based or not on a theoretical framework, and/or the absence of reporting of these factors in the studies in the present review, made it difficult to compare studies.

The mean global prevalence regarding the engagement of children and adolescents in sports practice was 44.8%. In terms of sport, data indicate that soccer is the most widely practiced among young Brazilians (53.1%), followed by volleyball (29.1%)³⁹. In the present review, only 04 studies of the 26 presented the prevalence according to the sport^{12,20,27,30}, demonstrating that soccer is the most practiced sport, corroborating the findings of Azevedo et al.³⁹.

This higher frequency of participation in soccer presented by some studies in this review is put forward as one of the possible explanations for the higher prevalence of participation in sports observed in males (63.1%) compared to females. This reflects the fact that some sports, such as soccer and futsal, favor the participation of boys, not girls. However, the studies included in this review that evaluated participation in sports according to sex found that volleyball was the most practiced among girls. Sports continue to be evaluated in terms of gender, both for those with a less pronounced predilection, such as basketball and volleyball, and for those already seen as potentially masculine, as is the case of soccer and futsal. Even though women in the current scenario occupy different spaces hitherto dominated by men, there are still reflexes that make it difficult for them to participate in certain sports³⁹.

In addition to this gender issue, the family can also influence this outcome, referring to greater male participation in sports, since boys tend to receive greater encouragement to participate in sports than girls⁴⁰. This scenario calls attention to the need for actions aimed at increasing female participation in sports, in order to provide greater levels of physical activity, which contribute to an increase in energy expenditure⁶ and the development of physical fitness⁷, serving as protection against the development of chronic diseases in the short and long term⁴.

As the main limitation of the present study, it is highlighted that, due to the lack of a common criterion for determining sports participation, the comparability between the studies is compromised. However, the data from the present study reflect the current academic scenario regarding sports participation and its prevalence among Brazilian children and adolescents. These results can be used as a base document for the development of actions aimed at increasing participation among young people, as well as directing new studies on the subject, given that not all regions of the country are represented in these studies or the child population.

CONCLUSION

From the data obtained in the current review, it was possible to conclude that the mean prevalence of sports participation is low and that this is influenced by the participant's sex, as boys presented a higher prevalence than girls.

COMPLIANCE WITH ETHICAL STANDARDS

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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

Conceived and designed the experiments: GF. Performed the experiments: FBP, CBS, JGM. Analyzed the data: MBL, MMF, SCF. Writing-review and editing: LSC, GFM, EPF, FBP. All authors have read and agreed to the published version of the manuscript.

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