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Prevalence of sports participation among Brazilian adolescents: a systematic review

Prevalência da participação esportiva entre adolescentes brasileiros: uma revisão sistemática

Santiago Maillane-Vanegas[1,2]
Jamile Sanches Codogno[1,2,3]
Bruna Camilo Turi[2,3]
Diego Giuliano Destro Christofaro[1,2,3]
Romulo Araújo Fernandes[1,2,3]

Abstract – The objective of this study was to describe the prevalence of sports participation in Brazilian children and adolescents using a systematic review approach. This review follows the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) statement and the protocol was previously registered on PROSPERO (95441), the searches were performed in the following electronic databases: PubMed, ScIELO, Bireme, and EMBASE. The search strategy included a combination of keywords: Children and adolescents, prevalence and sports participation. Four papers included 7104 adolescents aged from 10 to 18 years old, living in four different cities located at Southeast (n= 1) and South (n= 3) of Brazil data collections were carried out between 2004 and 2012. Most of the studies had cross-sectional design and the findings of all surveys were published in international journals. The definition of "sports participation" was not the same in all papers. The overall prevalence of sports participation among adolescents was 58.1%, higher among boys (65.9%) than in girls (51.5%). The systematic review identified that the prevalence of sports participation among Brazilian adolescents is low and significantly affected by gender.

Key words: Adolescent behavior; Child; Epidemiology; Sports.

Resumo – *O objetivo deste estudo foi descrever a prevalência da participação esportiva em crianças e adolescentes brasileiros por meio de uma revisão sistemática. Esta revisão segue os itens Preferred Reporting for Systematic reviews e Meta-Analysis (PRISMA) e o protocolo foi previamente cadastrado no PROSPERO (95441), as buscas foram realizadas nas seguintes bases de dados eletrônicas: PubMed, ScIELO, Bireme e EMBASE . A estratégia de busca incluiu uma combinação de palavras-chave: crianças e adolescentes, prevalência e participação esportiva. Quatro artigos incluíram 7104 adolescentes com idades entre 10 e 18 anos, residentes em quatro cidades diferentes localizadas no Sudeste (n = 1) e Sul (n = 3) do Brasil, foram realizadas coletas de dados entre 2004 e 2012. As maiorias dos estudos tiveram desenho transversal e os achados de todas as pesquisas foram publicados em revistas internacionais. A definição de "participação esportiva" não foi a mesma em todos os artigos. A prevalência geral de participação esportiva entre adolescentes foi de 58,1%, maior entre os meninos (65,9%) do que nas meninas (51,5%). A revisão sistemática identificou que a prevalência de participação esportiva entre adolescentes brasileiros é baixa e significativamente afetada por gênero.*

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

1 São Paulo State University. Department of Physical Therapy. Post-Graduation Program in Physical Therapapy. Presidente Prudente, SP. Brazil.

2 São Paulo State University. Department of Physical Education. Laboratory of InVestigation in Exercise. Presidente Prudente, SP. Brazil.

3 São Paulo State University. Post-Graduation Program in Kinesiology. Institute of Biosciences. SP, Brazil.

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INTRODUCTION

In 2016, the city of Rio de Janeiro held the Olympic Games, four years after London and eight years after Beijing. Moreover, in 2014 Brazil held the FIFA World Cup. The years leading up to the Olympic Games and FIFA World Cup, there is an intensive discussion in the society about the consequences of this sort of big event on Brazilian society.

In terms of consequences related to these big events, the impact of sports participation on health is one of them, mainly in pediatric groups[1]. The relationship between sports participation and health outcomes is particularly relevant among children and adolescents because sports participation in early life affects health outcomes in childhood, adolescence, and adulthood[2,3]. Thus, the engagement of children and adolescents in sports seems a relevant public health strategy to improve health aspects of the population and also mitigate health care costs[4].

Similar to general physical activity, sports participation in youth seems to be affected by factors like gender, age, and aspects of family nucleus[5]. The clear definition of its prevalence and correlates is a cornerstone to develop effective public health actions targeting the promotion of sports participation in pediatric groups. On the other hand, there is limited data about the prevalence of Brazilian children and adolescents regularly engaged in sports.

Therefore, the purpose of this study was to describe the prevalence of sports participation in Brazilian children and adolescents using a systematic review approach.

METHODOLOGICAL PROCEDURES

Research strategy

This review follows the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) statement and the protocol was previously registered on PROSPERO (95441). Citation tracking was performed in the included studies and previous systematic reviews to identify additional trials. We restricted to publications in English or Portuguese language. The searches were performed in the following electronic databases: PubMed, ScIELO, Bireme, and EMBASE. The search strategy included a combination of keywords: Children and adolescents, prevalence and sports participation, as follows:

PubMed: (((((((adolescent) OR adolescence) OR children) OR childhood) AND ((human NOT animals)))) AND ((((cross-sectional studies) OR prevalence) OR epidemiology) OR public health)) AND ((Brasil) OR Brazil)) AND sports
Bireme: ((childhood) OR (children) OR (adolescence) OR (adolescent) AND NOT (animals)) AND ((Brasil) OR (Brazil)) AND (sports) AND ((prevalence) OR ((public health) OR (epidemiology) OR (epidemiology) OR (cross-sectional studies)))
Scielo: ((childhood) OR (children) OR (adolescence) OR (adolescent) AND NOT (animals)) AND ((Brasil) OR (Brazil)) AND (sports) AND ((prevalence) OR ((public health) OR (epidemiology) OR (epidemiology) OR (cross-sectional studies)))
EMBASE: (((((((adolescent) OR adolescence) OR children) OR childhood) AND ((human NOT animals)))) AND ((((cross-sectional studies) OR prevalence) OR epidemiology) OR public health)) AND ((Brasil) OR Brazil)) AND sports

Inclusion criteria

We included cross-sectional, cohort and interventional studies that identified the prevalence of sports participation in Brazilian adolescents as the main outcome. Studies investigating adolescents, girls, and boys, aged between 12 and 18 years that practiced physical exercise through sports participation and practiced regularly, were considered eligible. Studies that identified just the rate of exercise, sedentary or physically active in adolescents in Brazil were excluded from this review. The outcome of this review was to identify the rate of sports participation in Brazilian adolescents, while there was no stratification according to sports.

Data extraction

Two independent reviewers (R.A.R. and S.M.V.) performed the screening in titles and abstracts to identify potentially eligible studies by reading the abstracts. The same reviewers assessed the full-texts considering the inclusion and exclusion criteria of this review. Late, the same two independent reviewers extracted data from included studies using a standardized extraction form. At all times of screening, in case of disagreement, a third reviewer was available to verify and resolve the issue (R.A.F.). The following information was extracted from the studies: sample size, mean age, sex, and sports participation rate in Brazil.

Appraisal of study quality

Two independent reviewers (R.A.F. and S.M.V.) assessed the methodological quality of the included studies using the risk of bias tool in prevalence studies: modification of an existing tool and evidence of interrater agreement (based on the Grades of Recommendation, Assessment, Development, and Evaluation (GRADE) and Cochrane approaches). The overall quality of evidence was assessed using the risk of bias tool in prevalence studies: items 1 to 4 assess the external validity of the study (domains are selection and nonresponse bias), items 5 to 10 assess the internal validity (items 5 to 9 assess the domain of measurement bias, and item 10 assesses bias related to the analysis)[6].

RESULTS

Initially, considering the four database and the keywords previously defined, search identified 1180 potential papers (Figure 1). There were few duplicated papers (n= 65 [5.5%]), and 65 papers were excluded based on titles and abstracts. Finally, 950 papers were checked in order to select manuscripts that would compose the systematic review. Four papers were included in this review[7-10].

The quality of the four selected papers was assessed and two studies reached the maximum score[7,9], while other two studies reached 80% of the maximum score (Table 1).

The four papers included 7104 adolescents aged from 10 to 18 years

old, living in four different cities located at Southeast (n= 1) and South (n= 3) of Brazil (Table 2). Data collections were carried out between 2004 and 2012. Most of the studies had cross-sectional design and the findings of all surveys were published in international journals. The definition of "sports participation" was not the same in all papers. In general, the engagement in sports was considered and no additional data was analyzed (e.g. previous time of engagement, days per week and time per day). The only exception was the survey by Fernandes et al.[7], in which sports participation was considered ≥4 hours per week over the last three months.

The overall prevalence of sports participation among adolescents was 58.1%, higher among boys (65.9%) than in girls (51.5%).

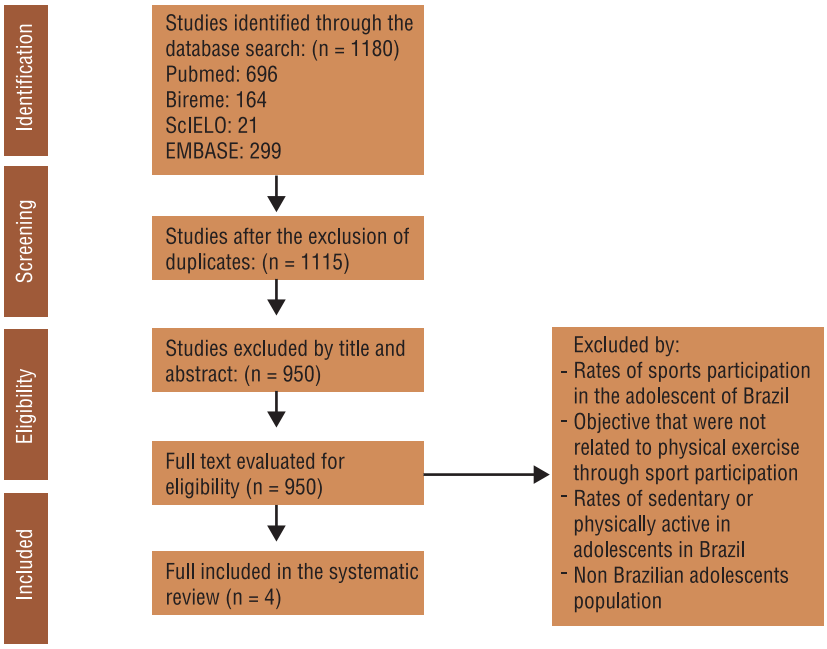

Figure 1. Flowchart of the systematic review.

Table 1. Assessment of studies quality.

Studies	Was the study target population a close representation of the national population in relation to relevant variables, e.g. age, sex, occupation?	Was the sampling frame a true or close representation of the target population?	Was some form of random election used to select the sample, OR, was a census undertaken?	Was the likelihood of non-response bias minimal?	Were data collected directly from the subjects (as opposed to a proxy)?
Coledan et al.[8]	YES	YES	YES	YES	YES
Dumith et al.[9]	YES	YES	YES	YES	YES
Fernandes et al.[7]	YES	YES	YES	YES	YES
Sales-Nobre et al.[10]	YES	YES	YES	YES	YES

Studies	Was an acceptable case definition used in the study?	Was the study instrument that measured the parameter of interest shown to have reliability and validity (if necessary)?	Was the same mode of data collection used for all subjects?	Was the length of the shortest prevalence period for the parameter of interest appropriate?	Were the numerator(s) and denominator(s) for the parameter of interest appropriate?
Coledan et al.[8]	YES	YES	YES	NO	NO
Dumith et al.[9]	YES	YES	YES	YES	YES
Fernandes et al.[7]	YES	YES	YES	YES	YES
Sales-Nobre et al.[10]	YES	YES	YES	NO	NO

Table 2. General data about the selected studies.

Studies	Data collection (Year)	Journal of publication	Overall sample size	Sample size Boys / Girls	Location
Coledan et al.[8]	2012	Cad Saude Publica	827	427/450	Londrina
Dumith et al.[9]	2004/2008	Pediatr Exerc Sci	4120	2023/2097	Pelotas
Fernandes et al.[7]	2007	BMC Public Health	1752	812/940	Pres. Prudente
Sales-Nobre et al.[10]	2006	Rev Salud Publica (Bogota)	355	205/150	Florianopolis
Overall	---	---	7104	3467/3637	---
Studies	**Age range**	**Design**	**Sports participation (girls [%])**	**Sports participation (boys [%])**	**Overall sports participation (%)**
Coledan et al.[8]	10-16	Cross-sectional	19.6%	47.7%	32.4%
Dumith et al.[9]	11-14	Longitudinal	76.2%	87.5%	81%
Fernandes et al.[7]	11-17	Cross-sectional	9.4%	21.2%	14.8%
Sales-Nobre et al.[10]	15-18	Cross-sectional	66.7%	68.7%	67.8%
Overall	10-18	---	51.5%	65.9%	58.1%

DISCUSSION

Systematic review considering papers describing the engagement in sports among Brazilian adolescents, which identified that sports participation, is an outcome of low prevalence among Brazilian adolescents.

Considering the lack of studies available, the overall prevalence of children and adolescents engaged in sports was 58.1%. The participation in sports in this systematic review did not consider other aspects of exercise (e.g. minimum amount per week) and if so, the rate would be markedly lower[11]. In terms of sports, among adolescents living in the American continent, soccer is the most popular (30.6%), followed by bowling (23%), baseball (16.9%) and swimming (14.9%)[12]. In the four studies included in this systematic review, just one of them[9] described sports with more details, making it hard to identify the most popular sport in Brazil among adolescent, even considering how popular soccer is[12].

Another relevant aspect observed is the difference between boys and girls, in which the prevalence was higher among boys (65.9%) than girls (51.5%). Family nucleus has a relevant impact on the physical activity level of adolescents, in which boys are more stimulated to be engaged in this kind of activity than girls[13]. A similar phenomenon has been observed in sports participation as well[5]. Sports participation constitutes a more specific manifestation of exercise but it seems to be affected by gender like other domains of physical activity and, thus, efforts should be made to increase the participation of girls in sports in order to improve growth and prevent diseases throughout life.

There were also regional differences regarding sports participation. Brazil has several governmental programs designed to promote sports participation among children and adolescents, but no data is available about the nationwide prevalence, as well as these programs have gaps in terms of purposes and results achieved. In this systematic review, data available about sports participation among children and adolescents came from surveys

carried out in the South and Southeast regions (wealthy regions in Brazil), limiting nationwide inferences. In South America, there are large discrepancies in terms of budget available to support research across the nations and inside the country, such as Brazil[14,15]. This regional disparity might justify the absence of data published in the less developed areas of Brazil.

CONCLUSION

In summary, the systematic review identified that the prevalence of sports participation among Brazilian adolescents is low and significantly affected by gender. The absence of nationwide data about sports participation in Brazil is alarming mainly because the country held the most important sports events in the world, denoting that simple information is not available, such as characteristics, and the background of sports (essential to create effective public policies to promote sports participation).

COMPLIANCE WITH ETHICAL STANDARDS

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Conflict of interest statement

The authors have no conflict of interests to declare.

Author Contributions

Conceived and designed the experiments: J.S.C. Performed the experiments: B.C.T. Analyzed the data: R.A.F. Contributed reagents/materials/analysis tools: D.G.D.C. Wrote the paper: S.M.V.

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CORRESPONDING AUTHOR

Santiago Maillane-Vanegas
Department of Physiotherapy, Sao Paulo State University (UNESP)
Zip code: 19026140, Presidente Prudente, Sao Paulo, Brazil
E-mail: Santiagovanegas16@gmail.com