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Capability to promote physical activity in South American countries: an ecological study

Capacidade de promover atividade física em países sul-americanos: um estudo ecológico

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ABSTRACT

Objective: To analyze the relationship between physical activity (PA) research, monitoring, and policy indicators and the prevalence of PA in South American countries. Methods: An ecological study was carried out based on PA information from a representative sample of the adult population, through national surveys, from all countries in South America. In each country, data on total and leisure-time PA were assessed using survey-specific questionnaires, and information on research, monitoring, and policy indicators to promote PA was provided. Spearman correlation was carried out for the analysis. Results: The frequency of policies aimed only at promoting PA (rho = 0.67, p = 0.025) and the frequency of discontinued policies (rho = -0.65, p = 0.028) were correlated to the prevalence of leisure-time PA. No relationship was observed for the prevalence of total PA. Conclusion: Targeted and sustained public policies seems be related with leisure-time PA in South American countries.

Keywords: Surveillance; Public policy; Ecological studies; Physical activity; South America.

RESUMO

Objetivo: Analisar a relação entre indicadores de pesquisa, monitoramento e políticas de atividade física (AF) e a prevalência de AF em países sul-americanos. Métodos: Foi realizado um estudo ecológico com base em informações de AF de uma amostra representativa da população adulta, por meio de pesquisas nacionais, de todos os países da América do Sul. Em cada país, os dados sobre AF total e de lazer foram avaliados usando questionários específicos da pesquisa, e foram fornecidas informações sobre indicadores de pesquisa, monitoramento e políticas para promover a AF. A correlação de Spearman foi realizada para a análise. Resultados: A frequência de políticas destinadas apenas à promoção da AF (rho = 0,67, p = 0,025) e a frequência de políticas descontinuadas (rho = -0,65, p = 0,028) foram correlacionadas com a prevalência de AF de lazer. Não foi observada relação para a prevalência de AF total. Conclusão: Políticas públicas direcionadas e sustentadas parecem estar relacionadas com a AF de lazer em países sul-americanos.

Palavras-chave: *Vigilância; Política pública; Estudos ecológicos; Atividade física; América do Sul.*

Introduction

Insufficient levels of physical activity (PA) and increased time in sedentary behavior are associated with morbidity and around 5 million deaths per year, being considered a significant economic burden for national health systems[1,2]. Governments around the world have adopted, as a better way of investing resources, developing public policies to promote PA and reduce sedentary behavior[2,3]. Nevertheless, trends in insufficient PA are increasing, going far from the Global Action Plan on Physical Activity[4].

Despite the development and implementation of PA policies, evidence on this type of policy is still limited, and the search for information is extremely relevant[5-7]. Monitoring, research, and policy on PA are important aspects to be developed by countries aiming the promotion of PA[8]. However, there is an urgent need for better diversity in study populations, as generalizability remains a weakness of the field. This is especially true in low- and middle-income countries, where there is a lack of representation and understanding regarding PA policy research[3,9,30], which are more likely to have less comprehensive, implemented, and effective PA policies, in addition to having a high prevalence of physical inactivity[9-11].

Recent studies have demonstrated the feasibility of conducting studies that analyze national policies in countries such as those in South America[12,30], making it possible to meet the need to identify and advance the analysis of indicators existing research, monitoring, and PA policy in the countries of this subcontinent, and potentially influence and improve policy development in this crucial area. Therefore, the present study aimed to analyze the relationship between research, monitoring, and policy indicators of PA with the prevalence of PA in South American countries.

Methods

Study design

This ecological study is based on secondary data regarding indicators of PA promotion capacity and the prevalence of PA among the adult population in South American countries.

The prevalence of total and leisure-time physical activity

The study by Werneck et al.[11] was used as a reference for PA information from a representative sample of the adult population. South American surveys have assessed PA through traditional questionnaires, with few exceptions. The short version of the International Physical Activity Questionnaire (IPAQ)[13] was used in Peru, Venezuela, and Argentina (the latter including questions about PA practice in each domain), while Colombia (considering questions about leisure-time and transport PA) used the long IPAQ, including only the leisure and transport areas. Chile, Ecuador, Guyana, Paraguay, Suriname, and Uruguay used the Global Physical Activity Questionnaire (GPAQ)[14]. Brazil used a specific questionnaire derived from the Surveillance System for Risk and Protective Factors for Chronic Diseases by Telephone Survey[15]. Bolivia and Colombia exclusively considered questions regarding leisure-time PA, while Venezuela included questions about total PA.

For leisure-time PA, any non-zero value was used to classify individuals as "active". The sum of PA across different domains (leisure, transportation, and occupational) was used to calculate total PA, with at least 150 minutes per week as the criterion for being classified as physically active.

Indicators of physical activity promotion capacity

The conceptual model establishing the national capacity for PA promotion[24,25], developed by the Global Observatory on Physical Activity (GoPA!)[16], considers the following indicators:

Research and Monitoring

Research data refers to the number of scientific articles published on PA between 1950-2019, based on the survey by GoPA! Information on the number of national surveys carried out by each country was obtained based on a study survey that identified how PA and sedentary behavior have been measured in national health surveys in South American countries[17].

Policy

Number of national health policies found in each country, publication period, prevalence of policies focused solely on PA promotion, policies articulated with other sectors, and discontinued policies (i.e., according to the classic policy cycle, those that did not continue, which for some reason were terminated)[18,20].

In order to evaluate public PA policies in all South American countries, in the health sector, we sought to carry out descriptive and documentary research carried out in four stages: (1) identification of representatives in South American countries, being the main researchers, professionals and/or public policy makers in the area;

(2) search for policies already cataloged in the GoPA! inventory; (3) consultation with national representatives of the South American Physical Activity and Sedentary Behavior Network (SAPASEN) on the main public policies and contacts of people who work directly and/or indirectly with these policies in their countries; (4) search for policies on official websites in each country.

Documents that presented details about the national PA policy, program, or plan, and only represented policies at the national level linked to the health sector, were included. Based on the Comprehensive Analysis of Policy on Physical Activity[18], the information regarding the identified documents was extracted and presented by country/document, with a descriptive analysis of the data referring to the number of eligible documents, period of publications, prevalence of policies specific to PA, prevalence of discontinued policies, and frequency of policies that collaborate with other sectors.

Statistical analyzes

Descriptive statistics of relative and absolute frequencies were used to analyze the PA promotion indicators of each country. Ten countries were included in the total PA analyses, and eleven in the leisure-time PA analyses. Due to the small number of countries, we directly opted for the use of Spearman's correlation. We classified the correlation strength as weak ($0.1 \leq |rho| < 0.3$), moderate ($0.3 \leq |rho| < 0.5$), or strong ($|rho| \geq 0.5$), and considered a significance level of $p < 0.05$.

Results

Table 1 presents information on the prevalence of total and leisure-time PA and on the indicators of PA promotion capacity, including information on the position of each country in the global ranking regarding the number of scientific articles published on PA (research domain), information on the number of national surveys carried out by each country (monitoring domain), and information on the number of national public policies found, in the health sector, in each country, the period of publication, prevalence of policies aimed only at the promotion of PA, discontinued policies, and policies that are articulated with other sectors (policy domain).

Ecuador and Uruguay have the highest prevalence of total PA (81.7% and 79.4%, respectively). Regarding the prevalence of PA during leisure time, Guyana presented the lowest prevalence (26.9%) and Argentina the highest (46.5%). In research, Brazil stands out as the country with the most publications of scientific articles. Peru and Brazil are the countries that have developed the most national research including information on PA. In politics, Chile stands out as the country with the most policies aimed at promoting PA in the health sector and with a longer publication period for these documents than in other countries; Peru had only three recently developed policies, all specifically promoting PA. In Suriname, the only policy found was not specific to promoting PA, which for some reason was discontinued and had no connection to sectors other than health. In Bolivia and Brazil, the policies found were also exclusively linked to the health sector.

Correlations were analyzed between indicators of research, surveillance, and public policies on PA, and the prevalence of total and leisure-time PA (Table 2). Al-

Table 1 – Indicators of total and leisure-time physical activity and indicators of physical activity promotion capacity (research, monitoring and policy) in South American countries.

Country	Prevalence of physical activity		Research	Monitoring	Policy				
	Total physical activity	Leisure-time physical activity	Number of articles	Number of national searches	Number of policies	Year of policies (range)	% in the area	% discontinued	% intersectoral
Argentina	68.1	46.5	74	4	10	2007-2021	50.0	40.0	30.0
Bolivia	—	37.7	7	2	3	2004-2013	33.0	66.0	0.0
Brazil	67.0	42.9	1200	5	4	2011-2017	50.0	25.0	0.0
Chile	70.5	31.4	173	3	14	1998-2022	21.0	28.0	14.0
Colombia	—	36.5	226	4	4	2009-2018	50.0	50.0	0.0
Ecuador	81.7	37.8	37	2	3	2013-2018	33.0	66.0	100.0
Guyana	70.9	26.9	2	1	5	2011-2019	20.0	80.0	20.0
Paraguay	77.2	38.2	9	1	2	2014	50.0	50.0	0.0
Peru	69.6	40.4	43	6	3	2015-2020	100.0	0.0	33.0
Suriname	60.9	28.0	6	1	1	2015	0.0	100.0	0.0
Uruguay	79.4	44.8	10	3	4	2005-2017	50.0	25.0	0.0
Venezuela	56.9	—	28	2	2	2011-2012	100.0	0.0	0.0

Table 2 – Spearman correlations between indicators of physical activity promotion capacity and the prevalence of total and leisure-time physical activity among South American countries.

Indicators	Prevalence of physical activity			
	Leisure		Total	
	Coefficient (IC95%)	p	Coefficient (IC95%)	p
Research				
Number of articles	-0.43 (-0.68; 0.08)	0.180	-0.19 (-0.51; 0.18)	0.603
Monitoring				
Number of national surveys	0.60 (0.00; 0.88)	0.051	-0.04 (-0.65; 0.60)	0.906
Policies				
Number	0.03 (-0.58; 0.62)	0.931	0.07 (-0.58; 0.67)	0.843
% in the area	0.67 (0.11; 0.90)	0.025*	-0.20 (-0.74; 0.49)	0.579
% discontinued	-0.65 (-0.90; -0.09)	0.028*	0.13 (-0.54 ;0.70)	0.719
% intersectoral	0.06 (-0.55; 0.64)	0.852	0.49 (-0.19; 0.85)	0.144

*$p < 0.05$

though there is no relationship between all indicators of capacity to promote PA and the prevalence of total and leisure-time PA, it is observed that the prevalence of leisure-time PA presents a positive correlation with the frequency of policies aimed only at promoting PA (rho = 0.67, p = 0.025) and a negative correlation with the frequency of discontinued policies (rh o= -0.65, p = 0.028).

Discussion

This study aimed to analyze the relationship between PA research, monitoring, and policy indicators and the prevalence of PA in South American countries. The prevalence of leisure-time PA was directly correlated with the number of policies exclusive to promoting PA and inversely correlated with the number of discontinued policies. This findings suggest that (1) an increase in the number of policies specifically designed to promote PA is associated with a higher prevalence of leisure-time PA, which may corroborate the notes of the Global Action Plan for Physical Activity by demonstrating the relationship between having autonomous policies and the increase in PA[21]; (2) national PA policies are a key factor for PA promotion, however; if these policies are discontinued, the expected results may be compromised[20].

When talking about PA, the domain of leisure is the one that makes its practice subject to public interventions, and which, through local characteristics, is contextualized[22]. In South America, for example, the prevalence of leisure-time PA is higher among people with higher socioeconomic conditions[11], a fact that exemplifies the need to defend and expand public PA policies that seek to alleviate inequalities in access to public spaces for leisure-time PA[11,22].

The absence of relationship between policy indicators and the prevalence of total PA could be associated to the specificities of some policies, not being enough to impact other domains than the leisure one. Also, given the considerable frequency of discontinued policies, which may not have even been adopted[3], and the low frequency of intersectoral actions[23], establishing significant relationships based on data from surveillance, policies, and research among low- and middle-income countries might be challenging.

It was also observed that South American countries do not have strong PA surveillance systems, confirming findings in countries with similar economic contexts[27]. Regarding research indicators, except for Brazil, which ranks fourth in the world for PA research, the current data corroborate the literature by identifying that in low- and middle-income countries, publications on PA and health are low[28,30]. However, more investment in this area is needed, especially given the urgency to reverse low PA levels in countries with this context, as these indicators help identify areas in need of improvement[26,30]. As for policies, progress has been observed over the past decades[8], and there is a need to advance primarily in the aspect of intersectorality[23]. That is, to achieve the goal of reducing physical inactivity, South American countries need to advance in the existence and regularity of national PA surveillance systems, research, and the availability of national PA promotion plans/policies.

As the main strength of this study, the use of information from all 12 South American countries, provides a comprehensive view of the region. As limitation, we highlight the different source of data from different time frames. Additionally, ecological approaches are

vulnerable to ecological fallacy, which can distort data interpretation and lead to misleading conclusions about individual-level relationships based on group-level data[29]. Furthermore, future studies are expected to verify the relationship between other domains of PA and policy indicators beyond those linked to the health sector.

Conclusion

Targeted and sustained public policies seem be related with leisure-time PA. Continued efforts and strategic policy frameworks are necessary to achieve global health objectives and reduce the prevalence of physical inactivity in South American' adults.

Conflict of interest

The authors declare no conflict of interest.

Author's contributions

Pinheiro IKAS: Conceptualization; Methodology; Investigation; Writing – original draft; Approval of the final version. Sadarangani KP: Conceptualization; Writing – original draft; Approval of the final version. Tassitano RM: Conceptualization; Writing – original draft; Approval of the final version. Brazo-Sayavera J: Visualization; Funding acquisition; Writing – original draft; Approval of the final version. Ramírez-Vélez R: Methodology; Writing – original draft; Approval of the final version. Melo JCN: Formal analysis; Visualization; Writing – original draft; Approval of the final version. Santos L: Methodology; Writing – original draft; Approval of the final version. Silva DRP: Conceptualization; Methodology; Formal analysis; Data curation; Supervision; Visualization; Writing – original draft; Approval of the final version.

Declaration regarding the use of artificial intelligence tools in the article writing process

The authors did not use artificial intelligence tools for preparation of the manuscript.

Availability of research data and other materials

The contents underlying the research text are contained in the manuscript.

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