



Physical activity research: analysis of the agenda funded by the Brazilian Ministry of Health (2002-2023)

Pesquisas em atividade física: análise da agenda financiada pelo Ministério da Saúde do Brasil (2002-2023)

AUTHORS

Leonardo Araújo Vieira^{1,2}

Fabio Fortunato Brasil de Carvalho³

Debora Bernardo⁴

Lucas Lima Galvão¹

Douglas Roque Andrade⁵

Danilo Sales Bocalini¹

1 Universidade Federal do Espírito Santo, Center for Physical Education and Sports, Vitória, Espírito Santo, Brazil.

2 Prefeitura Municipal de Vitória, Exercise Guidance Service, Vitória, Espírito Santo, Brazil.

3 Ministry of Health, Instituto Nacional de Câncer, Rio de Janeiro, Rio de Janeiro, Brazil.

4 Brazilian Center for Analysis and Planning, Núcleo de Cidadania, Saúde e Desenvolvimento, São Paulo, São Paulo, Brazil.

5 Universidade de São Paulo, Escola de Artes, Ciências e Humanidades, São Paulo, São Paulo, Brazil.

CORRESPONDING

Leonardo Araújo Vieira

lcaramuru@gmail.com

Avenida Afonso Pena, 201, Edifício Castelo di Marostica, apartamento 1204, Praia da Costa, Vila Velha, Espírito Santo, Brazil.
Zip code: 29101-455.

DOI

10.12820/rbafs.31e0452i



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

Copyright© 2026 Leonardo Araújo Vieira, Fabio Fortunato Brasil de Carvalho, Debora Bernardo, Lucas Lima Galvão, Douglas Roque Andrade, Danilo Sales Bocalini.

ABSTRACT

Introduction: The National Agenda of Priorities in Health Research (*Agenda Nacional de Prioridades de Pesquisa em Saúde* - ANPPS) aims to align research funding from the Brazilian Ministry of Health (MoH) with the population's health priorities. Therefore, the ANPPS could help to align research on physical activity with health policies. **Objective:** To analyze physical activity research funded by the MoH with respect to: a) temporal trends of the number of studies, total funding, and funding per research project; b) distribution across thematic axes and ANPPS sub-agendas. **Methods:** A national time-series study was conducted through a search in the 'Health Research' system, covering the period from 2002 to 2023. Segmented linear regression analysis was used to estimate the annual variation, with a 95% confidence interval. **Results:** In total, 234 studies were funded, with a deflated total investment of approximately BRL 60.0 million, representing an average investment of BRL 256.5 thousand per research project. Fluctuations were observed in both the number of studies and the funding, with a downward trend in the number of studies, total funding, and funding per research project. The health consequences axis accounted for the largest number of studies (69.2%) and funding (69.9%). Among the sub-agendas, non-communicable chronic diseases stood out in terms of the number of studies (26.1%), while epidemiology received the highest amount of funding (27%). **Conclusions:** In the period covered, physical activity was included in the ANPPS funded by the MoH. However, increased funding for physical activity research is needed, particularly within the policy axis.

Keywords: Health research policy; Health research agenda; Health policy; Unified Health System; Health promotion.

RESUMO

Introdução: A Agenda Nacional de Prioridades de Pesquisa em Saúde (ANPPS) visa alinhar o financiamento de pesquisas pelo Ministério da Saúde com as prioridades de saúde da população. Portanto, a ANPPS pode aproximar as pesquisas em atividade física das políticas de saúde. **Objetivo:** Analisar as pesquisas em atividade física financiadas pelo Ministério da Saúde quanto a: a) evolução temporal do número, valor total e valor por pesquisa; b) distribuição por eixos temáticos e subagendas da ANPPS. **Métodos:** Trata-se de um estudo de série temporal, de abrangência nacional, realizado por meio de consulta no repositório "Pesquisa Saúde", no período de 2002 a 2023. A análise de regressão linear segmentada foi utilizada para estimar a variação anual, com um intervalo de confiança de 95%. **Resultados:** Foram financiadas 234 pesquisas e o valor total deflacionado foi de aproximadamente R\$ 60,0 milhões, o que corresponde a um investimento médio de R\$ 256,5 mil por pesquisa. Foram reveladas oscilações no número e no financiamento, com tendência decrescente para o número, o valor total e o valor por pesquisa. O eixo de consequências para a saúde concentrou o maior número de pesquisas (69,2%) e de recursos (69,9%). Entre as subagendas, destacaram-se as doenças crônicas não transmissíveis quanto ao número de pesquisas (26,1%) e a epidemiologia quanto ao montante de recursos (27%). **Conclusão:** O tema da atividade física esteve presente na agenda de pesquisa financiada pelo Ministério da Saúde. Entretanto, é necessário ampliar o montante de recursos para pesquisas em atividade física, principalmente no eixo de políticas.

Palavras-chave: Política de pesquisa em saúde; Agenda de pesquisa em saúde; Política de saúde; Sistema Único de Saúde; Promoção da saúde.

Introduction

Promoting physical activity (PA) is associated with so-

cial, economic, and health benefits^{1,2}. However, insufficient PA remains a global health problem, including

in Brazil, generating high costs for health systems³⁻⁵. From 1950 onwards, there have been significant advances globally in the field of PA research⁶ and scientific evidence is necessary to underpin the formulation and evaluation of policies. However, there is a disconnect between research and policies on physical activity⁷⁻⁹. Furthermore, there are significant global disparities between countries in their capacity for scientific output and the implementation of PA policies^{6,10}, which are related, among other aspects, to the availability of funding.

Brazil has a high capacity in indicators related to research and policies on PA¹¹. Regarding research, the country currently accounts for 5% of all publications on PA, ranking fourth in the world in scientific production¹¹. Regarding policies, since the creation of the National Health Promotion Policy in 2006, there has been significant expansion of actions and programs within the Unified Health System (*Sistema Único de Saúde - SUS*)¹²⁻¹⁴. However, challenges remain, most notably the absence of a specific national policy, insufficient funding, and the development of research focused on the needs of the SUS¹⁵.

In this context, with the aim of contributing to the resolution of health problems, the Ministry of Health (MoH) promotes the induction and fostering of research, including research on PA¹⁶. To this end, the MoH, through the Department of Science and Technology of the Secretariat of Science, Technology, Innovation and Health Complex (Decit/SECTICS/MS), in partnership with other funding agencies, finances research in line with the National Agenda of Priorities for Health Research (*Agenda Nacional de Prioridades de Pesquisa em Saúde - ANPPS*), which aims to align health priorities with research priorities and direct resources towards investment in strategic themes for the SUS¹⁷⁻¹⁹.

Therefore, ANPPS funding could be a strategy to bring PA research closer to SUS policies. However, this scenario has not yet been investigated, and defining this scenario could contribute to understanding the development of PA as a public health policy. Given the above, the current study aimed to analyze research in PA funded by the MoH and partners regarding: a) the temporal trends of the number, total funding, and funding per research project; b) the distribution across thematic axes and sub-agendas of the ANPPS.

Methods

Design

This is a nationwide ecological time-series study on

PA research funded by the MoH and partners between 2002 and 2023.

Data source

The data were consulted between February 10 and 26, 2024, in the Health Research repository (*Pesquisa Saúde*), available at: <http://pesquisasaude.saude.gov.br/pesquisas.xhtml>. This system presents data on research funded by the MoH since 2002 and allows searches by sub-agenda of the ANPPS.

The search was conducted using the advanced search tool, employing the following descriptors: “physical activity”, “physical activities”, “body practice”, “body practices”, “sport”, “sports”, “exercise”, “exercises”, “physical exercise”, “physical exercises”, “physical training”, “physical fitness”, “physical inactivity”, “sedentary behavior”, “sedentary”, “sedentary people”, and “sedentarism”. The descriptors were used in isolation, since the Health Research system has limitations in the combined use of Boolean operators.

Inclusion and exclusion criteria

Based on the reading of titles, keywords, abstracts, objectives, methodologies, and results, research in PA from all Federative Units, with the status “completed” or “in progress,” was included. All types of research, regardless of design, were considered in PA research projects, in which PA, in its different domains (free time, commuting, work or study, and household chores), was treated as an exposure factor or as an outcome of the investigation (primary or secondary). Considering the focus of PA on human health care and its applicability in public health policies, experimental studies involving animals were excluded.

Data extraction and classification of studies

The data were extracted and exported to a Microsoft Excel® spreadsheet. After exportation, any duplicates were removed. The studies were classified in a blinded and independent manner by two authors (LAV and LLG), with expertise in the subject matter, based on prior agreement. Doubts and disagreements were resolved by consensus.

Considering that PA does not constitute a specific sub-agenda of the ANPPS, but may be associated with various themes and different perspectives, the research was classified according to its purpose in the studies as: exposure factor, primary outcome, or secondary outcome.

Furthermore, the research was classified into the fol-

lowing categories: a) surveillance; b) correlates and determinants; c) health consequences; d) interventions; e) policies; f) combination of categories; g) others, according to the classification used in previous studies^{6,11}.

The research was also analyzed by ANPPS sub-agendas, according to the classification registered in the Health Research system, which includes 24 themes: Indigenous peoples' health; mental health; violence, accidents, and trauma; Black population health; non-communicable chronic diseases (NCDs); older adults' health; child and adolescent health; women's health; health of people with disabilities; food and nutrition; bioethics and ethics in research; clinical research; health production complex; health technology assessment and health economics; epidemiology; demography and health; oral health; health promotion; communicable diseases; communication and information in health; work management and health education; health systems and policies; health, environment, work, and biosafety; and pharmaceutical assistance¹⁷.

Additionally, the number and total value of health research projects funded by the MoH and its partners were consulted in the Health Research system, to enable comparisons between research on PA and the total number of health research projects.

For comparability purposes, the total nominal value was deflated based on the Broad National Consumer Price Index, considering December 2023 as the reference year²⁰.

Variables analyzed

The following variables were analyzed: a) number of research project; b) total deflated value; c) deflated value per research project; d) PA research axes; e) sub-agendas of ANPPS; and f) year of agreement.

Statistical analysis

A time trend analysis was conducted from 2004 to 2020 to highlight the evolution of the number, total deflated value, and deflated value per research in PA funded by the MoH and partners, using annual figures and values. The time frame was selected to avoid bias in the data analysis, considering the absence of funded research in PA in the years 2003, 2021, 2022, and 2023. It is important to note that the year of the research refers to the year of the agreement and not the development period, which usually lasts longer than one year.

Segmented linear regression analysis (joinpoint regression) was performed using the Joinpoint Regres-

sion Program software, in which the annual variation was estimated with a 95% confidence interval. The final model selected was the best-fit model, with the Annual Percentage Change (APC) based on the trend of each segment, estimating whether these values were statistically significant ($p < 0.05$). To quantify the trend in the years analyzed, the average annual percentage change (AAPC) was calculated, based on the cumulative geometric mean of the APC trends, with equal weights for the lengths of each segment during the fixed interval. The significance tests used are based on the Monte Carlo permutation method and the calculation of the annual percentage change in the ratio, using the logarithm of the ratio^{21,22}. In addition, the absolute and relative values of the number and total value of research in PA were analyzed in relation to the thematic axis and sub-agenda of the ANPPS using descriptive statistics.

Ethical aspects

As this research used publicly available secondary data, there was no need for review by a Research Ethics Committee.

Results

A total of 666 research projects were identified. After excluding duplicates, 354 research projects were evaluated, with 234 research projects on PA being included for analysis (Figure 1). PA was classified as a secondary outcome in 47% of the research projects, as an exposure factor in 40.2%, and as a primary outcome in 12.8%.

The number of research projects in PA represents 3.2% of the total research funded by the MoH and partners during the analyzed period, which totaled 7,258 research projects (Table 1). The total deflated value of research projects in PA between 2002 and 2023 was approximately BRL 60.0 million, which corresponds to an average annual deflated investment of BRL 2.7 million and BRL 256.5 thousand per research project. This amount corresponds to 1.7% of the total resources invested in research by the MoH and partners throughout the period, which totaled approximately BRL 3.5 billion (Table 1). Details of the minimum and maximum nominal and deflated values per research project in PA and the total research funded by the MoH can be found in the supplementary material (Supplementary Table 1).

Fluctuations were observed in the number of research projects, total deflated value, and deflated value per research project, with 2008 having the highest total deflated value, 2011 the highest deflated value per re-

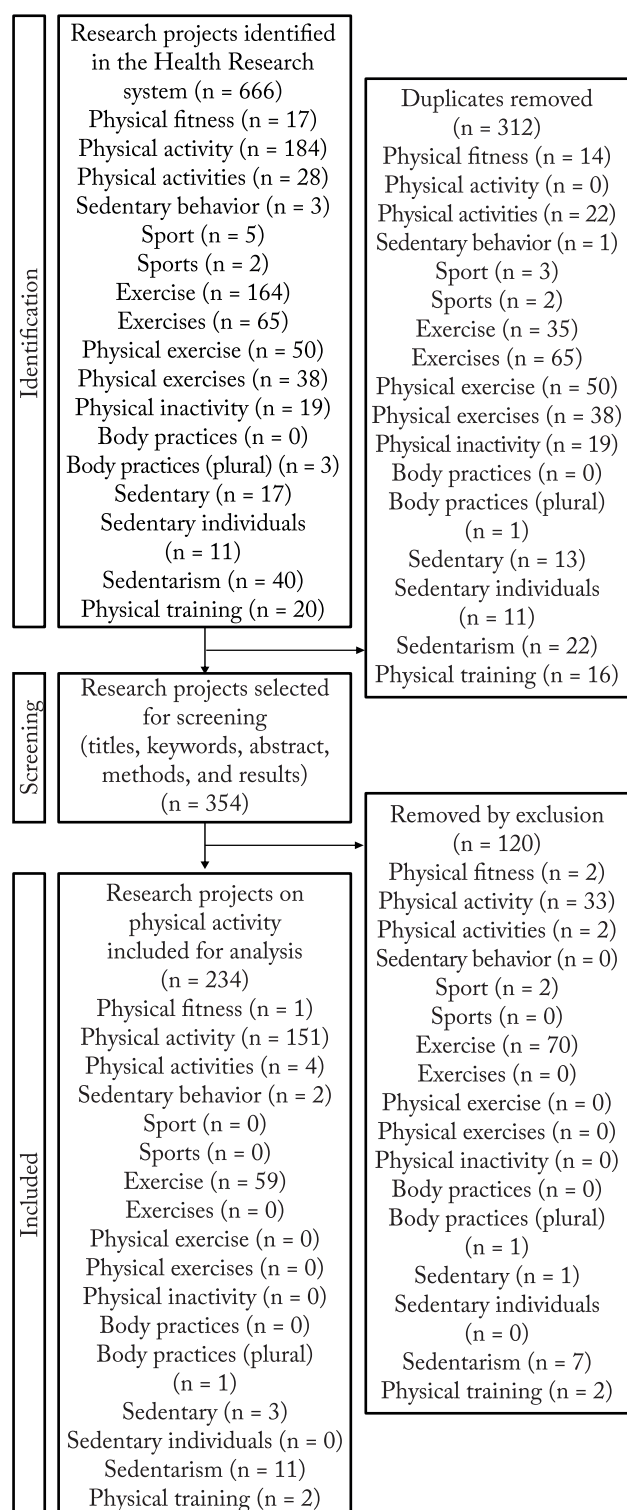


Figure 1 – Flowchart of the selection process for physical activity research funded by the Ministry of Health and partners, between 2002 and 2023.

Source: Own elaboration, based on data from the Health Research repository.

search project, and 2013 the highest number of research projects (Figure 2).

It was also identified that from 2004 to 2020 there was a decreasing trend in the total number of research projects (-5.5%), total deflated value (-11.7%), and deflated value per research project (-6.5%) (Table 2). The values referring to AAPC are the same as those for APC since the result of this statistical analysis was presented in only one segment.

Regarding the classification according to the research axis in PA, the health consequences axis accounted for the largest number of research projects (69.2%), followed by combination of axes (7.7%), intervention (6.4%), policies (4.7%), surveillance (4.7%), correlates and determinants (3.8%), and others (3.4%) (Figure 3A). With regard to the total value, the axis that received the largest amount of financial resources for research in PA was also health consequences (69.9%), followed by policies (10.1%), combination of axes (6.5%), surveillance (4.4%), intervention (3.3%), correlates and determinants (3.1%), and others (2.7%) (Figure 3B).

Regarding the sub-agendas of the ANPPS, the largest number of research projects in PA was related to NCDs (26.1%), followed by food and nutrition (18.8%), elderly health (10.7%), health promotion (9.4%), and child and adolescent health (7.7%) (Figure 4A). In terms of total value, the sub-agenda that received the largest amount of financial resources for research in PA was epidemiology (27%), followed by NCDs (21.2%), food and nutrition (12.1%), health promotion (10.9%), and elderly health (8.5%) (Figure 4B).

Discussion

The present study aimed to analyze research in PA funded by the MoH and partners regarding: a) the temporal trends of the number, total funding, and funding per research project; b) the distribution across thematic axes and sub-agendas of the ANPPS. Between 2002 and 2023, 234 research projects in PA were funded, with a total deflated value of approximately BRL 60.0 million, corresponding to an average annual deflated investment of BRL 2.7 million and BRL 256.5 thousand per research project. Important fluctuations were found in the number and funding of research projects, with a decreasing trend in the number, total value, and value per research project between 2004 and 2020. PA was classified as a primary outcome in only 12.8% of the research projects. The health consequences axis received the highest number of research projects and financial resources (69.2% and 69.9%, respectively); the ANPPS sub-agenda with the highest number of

Table 1 – Number, total nominal value, total deflated value, and deflated value of research projects on physical activity and health funded by the Ministry of Health and partners in Brazil, between 2002 and 2023.

Year	Number of research projects		Nominal total value (BRL)		Total deflated value (BRL)		Total deflated value per research project (BRL)	
	PA	Health	PA	Health	PA	Health	PA	Health
2002	2	88	32,192	2,008,582	109,142	6,809,818	54,571	77,384
2003	-	130	-	11,065,708	-	33,793,400	-	259,949
2004	18	835	734,803	82,017,117	2,092,548	417,942,796	116,253	500,530
2005	22	619	1,390,418	146,761,641	3,727,851	393,482,781	169,448	635,675
2006	28	815	2,998,650	158,790,682	7,804,110	413,259,228	278,718	507,067
2007	4	168	100,712	37,446,738	251,572	93,539,477	62,893	556,783
2008	5	329	6,917,256	174,797,617	16,241,335	410,415,138	3,248,267	1,247,462
2009	25	773	1,907,185	118,085,858	4,296,708	266,036,339	171,868	344,161
2010	6	190	627,873	51,732,962	1,339,076	110,331,830	223,179	580,694
2011	1	18	2,020,000	36,506,528	4,039,812	73,009,658	4,039,812	4,056,092
2012	6	354	587,331	79,702,238	1,113,012	69,181,145	185,502	195,427
2013	48	983	4,393,395	157,650,215	7,871,127	282,443,287	163,982	287,328
2014	3	203	1,325,600	65,750,515	2,228,813	110,550,378	742,938	544,583
2015	1	41	5,761	2,865,278	8,768	4,360,729	8,768	106,359
2016	9	299	753,318	98,457,043	1,071,612	140,057,497	119,068	468,420
2017	19	401	2,332,496	122,960,129	3,227,536	170,143,152	169,870	424,297
2018	7	180	329,923	68,976,610	438,771	91,733,311	62,682	509,630
2019	1	83	97,922	104,630,107	126,099	134,737,149	126,099	1,623,339
2020	29	602	3,284,221	132,024,720	4,054,456	162,987,936	139,809	270,744
2021	-	24	-	13,927,445	-	15,526,482	-	646,937
2022	-	45	-	23,795,917	-	25,049,905	-	556,665
2023	-	78	-	159,418,782	-	159,418,782	-	2,043,831
Total	234	7,258	29,839,056	1,849,372,432	60,042,348	3,544,206,998	256,591	488,317

Legend: PA: Physical activity; BRL: Brazilian reais.

Source: Own elaboration, based on data from the Health Research repository.

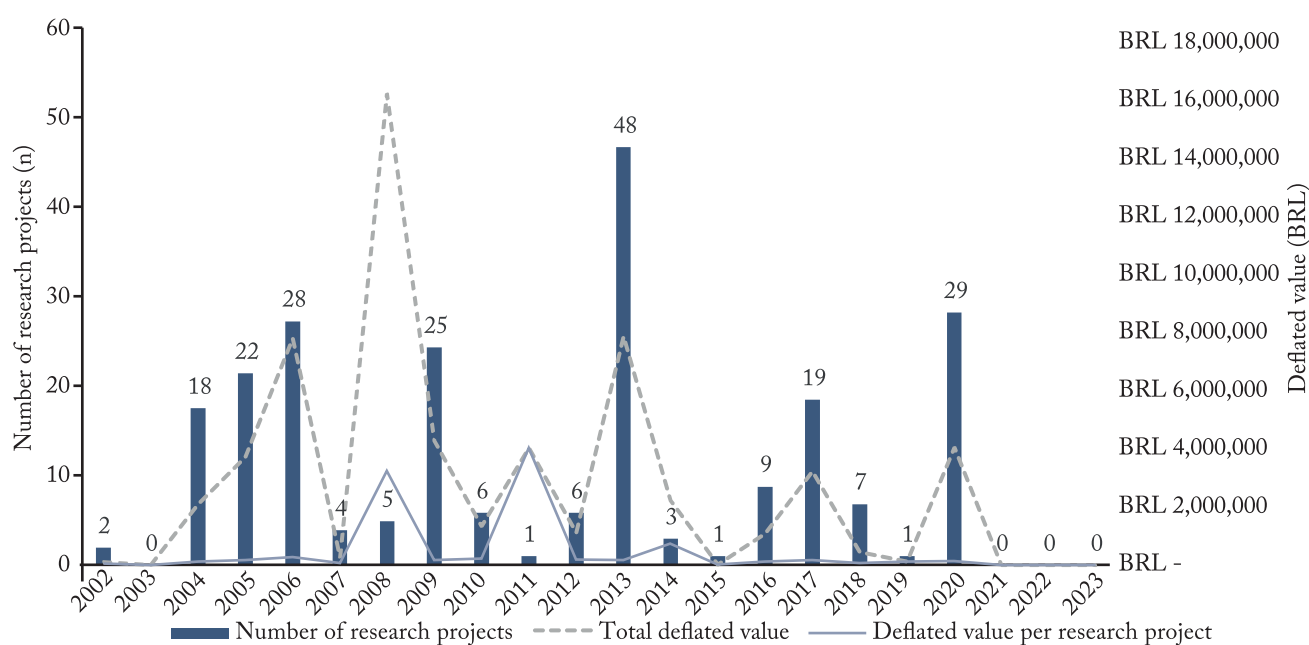


Figure 2 – Temporal evolution of the number, total deflated value, and deflated value per research project on physical activity funded by the Ministry of Health and partners in Brazil, between 2002 and 2023.

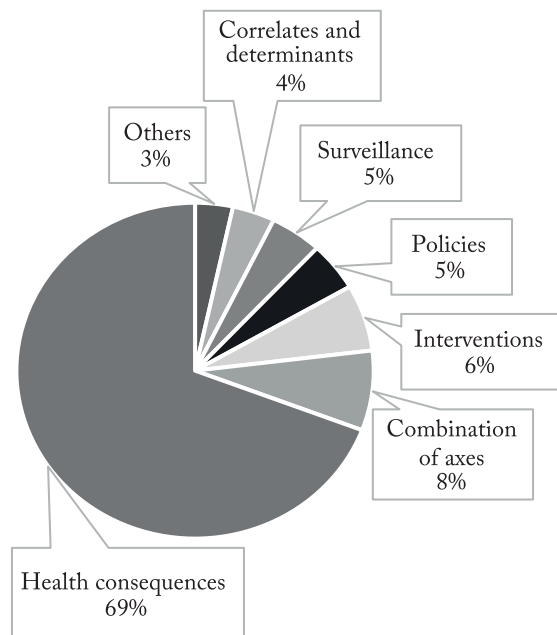
Source: Own elaboration, based on data from the Health Research repository.

Table 2 – Time trend analysis of the number of research projects, total value, and deflated value of research projects on physical activity funded by the Ministry of Health and partners in Brazil, between 2004 and 2020.

	Initial year	Final year	Annual percentage change	Average annual percentage change
Number of research projects	2004	2020	-5.5	-5.5
Total deflated value	2004	2020	-11.7	-11.7
Deflated value per research project	2004	2020	-6.5	-6.5

Source: Own elaboration, based on data from the research projects

3A. NUMBER OF RESEARCH PROJECTS



3B. TOTAL DEFLATED VALUE

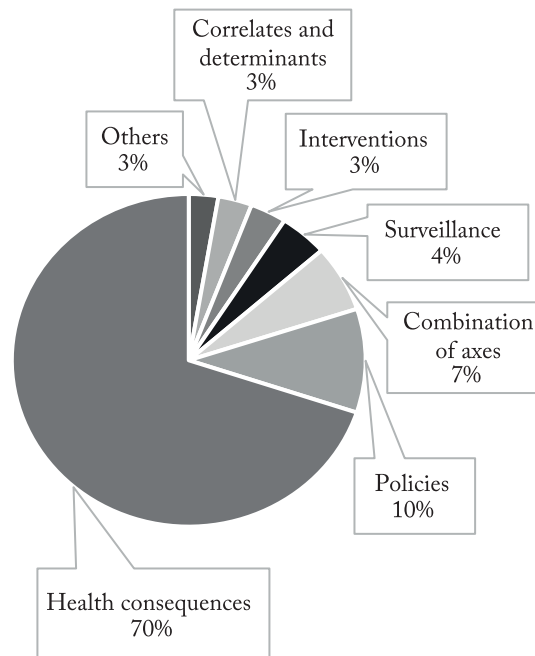


Figure 3 – Proportion of the number and total deflated value of physical activity research projects funded by the Ministry of Health and partners, by thematic area, in Brazil, between 2002 and 2023.

Source: Own elaboration, based on data from the research projects.

research projects was NCDs (26.1%); and the one that received the largest amount of resources was epidemiology (27%).

The scarcity of research projects on research funding in PA makes it difficult to compare results. Internationally, between 2012 and 2017, only 5% of research funded by the U.S. National Institutes of Health was related to PA, representing 4.3% of the total resources invested in promoting health research²³. In Brazil, although data exist on federal funding for health research, research projects on the funding of research in PA are still lacking²⁴.

Regarding research funding by the MoH, a study on the topic of food and nutrition showed that between 2002 and 2017, 283 research projects were funded, totaling an investment of BRL 17.3 million, which corresponds to an annual average of BRL 1.1 million and BRL 61.3 thousand per research project²⁵. Considering that the investment was presented as a nominal value,

it is possible to infer that the deflated values are higher than those found in PA research. This may be related to the fact that food and nutrition is a more consolidated topic in public health, and even has a specific national policy, which potentially strengthens the agenda.

A study related to the funding of dengue research by the MoH revealed that, between 2004 and 2020, 232 research projects were funded, with a total deflated investment of BRL 164.0 million, which corresponds to an annual average of BRL 9.6 million and BRL 707.0 thousand per research project²⁶. The same study also revealed fluctuations in funding amounts, with the number of funded research projects and the investment allocated to these projects showing a stationary trend²⁶, indicating that the stagnation in research funding by the MoH did not only affect PA.

Although establishing comparisons is not a simple task, given the numerous themes and different research

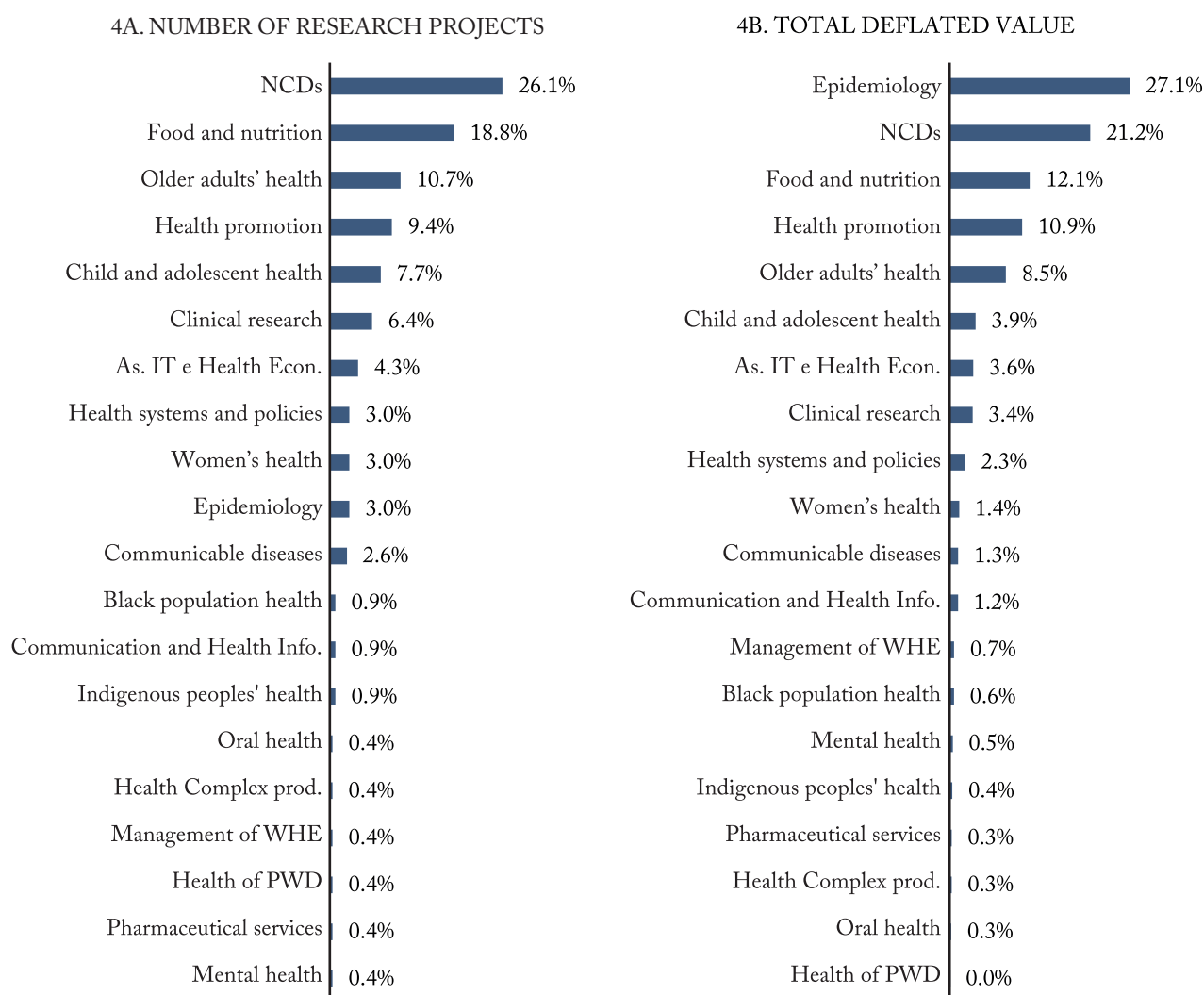


Figure 4 – Number and total deflated value of physical activity research projects funded by the Ministry of Health and partners, by sub-agenda of the National Agenda of Priorities for Health Research, in Brazil, between 2002 and 2023.

Legend: As. IT e Health Econ.: Health Technology Assessment and Health Economics; Communication and Health Info.: Communication and Information in Health; Health Complex prod.: Health production complex; NCDs: Chronic Non-Communicable Diseases; Management of WHE: Work and Health Education Management; Health of PWD: Health of People with Disabilities.

needs within the SUS, the need to increase funding for research in PA can be justified by the decreasing trend in the total number of research projects, the total value, and the average annual value. This goes against the growing body of evidence on the health benefits of PA, particularly in the prevention and treatment of NCDs³⁻⁵, the development of the PA agenda in the SUS²⁷, and the goal of increasing the prevalence of leisure-time PA by 30% by the year 2030²⁸.

The absence of research in PA in the years 2003, 2021, 2022, and 2023 coincides with the lack of targets in the planning and management instruments of the SUS, since the formulation of the agenda at the national level has as its main framework the National Health Promotion Policy, launched in 2006, and there were no

targets related to PA in the National Health Plan 2020-2023²⁷. In addition, on a broader scale, the lack of investment in research in PA can also be linked to cuts in public spending on science and technology policies that began in 2015²⁹, which were exacerbated between 2019 and 2022, with cuts in funding for institutions responsible for promoting research³⁰.

In this sense, the fluctuations recorded in the number of research projects and the amount of resources can be explained both by changes in priority on the agenda of PA within the SUS, and by periods of fiscal austerity, both factors being related to the political changes that occurred in the country^{12,27}. The characteristics of the research also help to explain the variations observed in the deflated value per research project, since more complex and nationally

comprehensive research, usually developed through multicenter projects, requires greater investment.

It is also noteworthy that PA was classified as a secondary outcome and as a primary outcome, respectively, in the largest and smallest number of research projects, demonstrating that PA was not the main object of investigation, and was frequently associated as a protective factor against NCDs. The absence of a specific national policy in the SUS may contribute to explaining the low number of research projects and low investment in research on PA, since its implementation has been identified as an important strategy to promote advances related to this topic^{31,32}, including the promotion of research.

Regarding the research axes in PA, our results are similar to those found in the literature^{6,11}. A systematic review of the evolution of scientific production in a global context demonstrates that, in the period between 1950 and 2019, the majority of research projects were on surveillance (32.5%), followed by consequences for health (31.7%), correlates and determinants (23.2%), interventions (8.3%), and policies (3.9%)⁶. In Brazil, a systematic review study based on data on global scientific production in PA, revealed that, between 1950 and 2019, the surveillance study axis presented the largest number of research projects (37%), followed by consequences for health (29%), correlates and determinants (26%), interventions (4%), and policies (4%)¹¹. Thus, regardless of the context analyzed, global or national, research in PA on policy outcomes and interventions is scarce, which points to a disconnection between research and PA policies.

In this sense, the Physical Activity Guide for the Brazilian Population, developed from a decentralized implementation agreement with the Federal University of Pelotas and constructed by a collective of researchers, coordinated by a Scientific Committee, based on a broad literature review and public consultation³³, constitutes a milestone for the integrated promotion of policies and research in PA.

The greater number and amount of resources allocated to PA research in the sub-agendas of NCDs and epidemiology can be explained by the fact that the priorities of the “health promotion” sub-agenda were established in 2003 and 2004, when it was called “risk factors,” which possibly influenced the definition of research priorities in health promotion linked to the “concept of risk”¹⁸. In addition, the SUS planning agenda related to PA was also developed with an almost exclusive focus on NCDs²⁷ in a feedback loop. The concentration of research around the NCD sub-agenda, from the perspec-

tive of epidemiology, is similar to what occurs in the field of Public Health³⁴. This, in a way, explains the fact that this area of knowledge was the first core link between Physical Education and Public Health, by naturalizing the language of the risk of “sedentary lifestyle”³⁵.

In light of the above, it is necessary to establish mechanisms for a more equitable allocation of resources to promote different themes within the ANPPS. In this sense, it is necessary to advance the debate on PA as a public health policy within the field of Policy, Planning and Management, to which research funding could certainly contribute. Among the strengths of this work, the novelty of the research topic and the broad period analyzed stand out, which made it possible to establish an overview of the research agenda in PA funded by the MoH and partners, as well as to identify possible (dis)connections with the development of PA policies. The availability of open data, in addition to providing transparency, enables the strengthening of advocacy actions and social control over PA in the SUS.

Among the limitations of the current study, we highlight potential inconsistencies in records, including incomplete data in the Health Research system, a finding also revealed in previous research projects^{25,26}. However, this is the official system of the MoH, which gathers information about funded research. Furthermore, this study did not allow for an evaluation of the MoH's investments in the preparation of technical documents and training activities, usually carried out through a Decentralized Execution Agreement or Letter of Agreement with institutions and researchers, for example, in the preparation of guiding documents³³, among others, which generally include research as a preliminary step of the production.

Further research is needed to analyze regional inequalities in funding for research in PA, as well as its applications and recommendations for the SUS. Finally, considering that research funding by the MoH involves partnerships with the Ministry of Education, through the Coordination for the Improvement of Higher Education Personnel (*Coordenação de Aperfeiçoamento de Pessoal de Nível Superior* - CAPES), the Ministry of Science and Technology, through the National Council for Scientific and Technological Development (*Conselho Nacional de Desenvolvimento Científico e Tecnológico* - CNPq), and with state research funding agencies, it is necessary to identify the specific contribution of these agencies to the promotion of research in PA.

In conclusion, the topic of PA was present on the re-

search agenda funded by the MoH and partners; however, it is necessary to move forward, mainly in increasing the amount of resources and in inducing funding for this policy axis. The creation of a National Physical Activity Policy within the SUS could contribute to strengthening PA as one of the priority agendas of the ANPPS. This policy needs to include, among other elements, a research component aimed at expanding knowledge production on PA as a public health policy.

Conflict of interest

The authors declare no conflict of interest.

Funding

The authors did not receive any type of funding for the study.

Authors' contributions

Vieira LA: Conceptualization; Methodology; Data analysis; Research; Data curation; Project management; Data presentation design; Original manuscript writing; Writing - revision and editing; Approval of the final manuscript version. Carvalho FFB: Conceptualization; Methodology; Data analysis; Research; Data curation; Supervision; Project administration; Data presentation design; Original manuscript drafting; Writing - revision and editing; Approval of the final manuscript version. Bernardo D and Andrade DR: Methodology; Data analysis; Data presentation design; Original manuscript drafting; Writing - revision and editing; Approval of the final manuscript version. Galvão LL: Methodology; Data analysis; Research; Data presentation design; Original manuscript writing; Writing - revision and editing; Approval of the final manuscript version. Bocalini DS: Conceptualization; Methodology; Data analysis; Research; Data curation; Supervision; Project management; Data presentation design; Original manuscript writing; Writing - revision and editing; Approval of the final manuscript version.

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

The authors did not use artificial intelligence tools to prepare the manuscript.

Availability of research data and other materials

All the data supporting the results of this study have been made available on SciELO Data and can be accessed at: <https://doi.org/10.48331/SCIELODATA.73OEYE>

Preprint

The manuscript was previously published as a preprint. Preprints: SciELO Preprints

DOI do Preprint: <https://doi.org/10.1590/SciELOPreprints.9618>
Posted: September 5, 2024 — Updated on April 28, 2025

References

1. Garcia L, Pearce M, Abbas A, Mok A, Strain T, Ali S, et al. Non-occupational physical activity and risk of cardiovascular disease, cancer and mortality outcomes: a dose-response meta-analysis of large prospective studies. *Br J Sports Med.* 2023;57:979–89. doi: <https://doi.org/10.1136/bjsports-2022-105669>
2. Salvo D, Garcia L, Reis RS, Stankov I, Goel R, Schipperijn J, et al. Physical Activity Promotion and the United Nations Sustainable Development Goals: Building Synergies to Maximize Impact. *J Phys Act Health.* 2021;18:1163–80. doi: <https://doi.org/10.1123/jpah.2021-0413>
3. Strain T, Flaxman S, Guthold R, Semenova E, Cowan M, Riley LM, et al. National, regional, and global trends in insufficient physical activity among adults from 2000 to 2022: a pooled analysis of 507 population-based surveys with 5.7 million participants. *Lancet Glob Health.* 2024;12:e1232–43. doi: [https://doi.org/10.1016/S2214-109X\(24\)00150-5](https://doi.org/10.1016/S2214-109X(24)00150-5)
4. Santos AC, Willumsen J, Meheus F, Ilbawi A, Bull FC. The cost of inaction on physical inactivity to public healthcare systems: a population-attributable fraction analysis. *Lancet Glob Health.* 2023;11:e32–9. doi: [https://doi.org/10.1016/S2214-109X\(22\)00464-8](https://doi.org/10.1016/S2214-109X(22)00464-8)
5. Prodel E, Mrejen M, Mira PAC, Britto J, Vargas MA, Nobrega ACL. The burden of physical inactivity for the public health care system in Brazil. *Rev Saude Publica.* 2023;57:37. doi: <https://doi.org/10.11606/s1518-8787.2023057004589>
6. Varela AR, Cruz GIN, Hallal P, Blumenberg C, Silva SG, Salvo D, et al. Global, regional, and national trends and patterns in physical activity research since 1950: a systematic review. *Int J Behav Nutr Phys Act.* 2021;18(1):5. doi: <https://doi.org/10.1186/s12966-020-01071-x>
7. Pratt M, Varela AR, Bauman A. The Physical Activity Policy to Practice Disconnect. *J Phys Act Health.* 2023;20:461–4. doi: <https://doi.org/10.1123/jpah.2023-0071>
8. Ding D, Chastin S, Salvo D, Nau T, Gebel K, Sanchez-Lastra MA, et al. Realigning the physical activity research agenda for population health, equity, and wellbeing. *The Lancet.* 2024;404:411–4. doi: [https://doi.org/10.1016/S0140-6736\(24\)01540-X](https://doi.org/10.1016/S0140-6736(24)01540-X)
9. Ding D, Ramirez Varela A, Bauman AE, Ekelund U, Lee IM, Heath G, et al. Towards better evidence-informed global action: lessons learnt from the Lancet series and recent developments in physical activity and public health. *Br J Sports Med.* 2020;54:462–8. doi: <https://doi.org/10.1136/bjsports-2019-101001>
10. Minatto G, Silva KS, Bandeira AS, dos Santos PC, Sandreschi PF, Manta SW, et al. National policies on physical activity from 64 countries with different economies: a scoping review with thematic analysis. *Health Policy Plan.* 2023;38:737–65. doi: <https://doi.org/10.1093/heapol/czad024>
11. Machado PG, Florindo AA, Knuth AG, Ramirez Varela A, Malta DC, Kohn ER, et al. Progress in Physical Activity Surveillance, Research, Policy, and Gender Equity in Brazil: Results From the Global Observatory for Physical Activity. *J Phys Act Health.* 2025;22(7):819–26. doi: <https://doi.org/10.1123/jpah.2024-0375>

12. Vieira LA, Carvalho FFB. As práticas corporais e atividades físicas nos 15 anos da política nacional de promoção da saúde: a defesa da equidade em um contexto de austeridade. *Pensar Prat.* 2021;24:e68737. doi: <https://doi.org/10.5216/rpp.v24.68737>
13. Carvalho FFB, Guerra PH, Silva DB, Vieira LA. Oferta e participação nas práticas corporais e atividades físicas na Atenção Primária no Brasil: análise de 2014 a 2022. *Cien Saude Colet.* 2025;30:e09492023. doi: <https://doi.org/10.1590/1413-81232025301.09492023>
14. Dutra RP, Knuth AG. Práticas corporais e atividades físicas desenvolvidas na Atenção Primária à Saúde no Brasil entre 2013 e 2021. *Physis.* 2025;35:e350119. doi: <https://doi.org/10.1590/S0103-73312025350119pt>
15. Carvalho FFB, Vieira LA. Práticas corporais e atividades físicas como política pública de Saúde: desafios para avançar na atenção primária do Sistema Único de Saúde no período de 2023 a 2026. *Pensar Prat.* 2023;26:e75847. doi: <https://doi.org/10.5216/rpp.v26.75847>
16. Brasil. Secretaria de Atenção Primária à Saúde do Ministério da Saúde do Brasil. Coordenação-Geral de Promoção da Atividade Física e Ações Intersectoriais: gestão da atividade física no Ministério da Saúde do Brasil. *Rev Bras Ativ Fis Saude.* 2022;27:1–4. doi: <https://doi.org/10.12820/rbafs.27e0248>
17. Brasil. Ministério da Saúde. Agenda Nacional de Prioridades de Pesquisa em Saúde. 2.ed. Brasília: Ministério da Saúde; 2015. Available from: <https://bvsms.saude.gov.br/bvs/publicacoes/agenda_nacional_prioridades_2ed_4imp.pdf> [2025 September].
18. Akerman M, Fischer A. Agenda Nacional de Prioridades na Pesquisa em Saúde no Brasil (ANPPS): foco na subagenda 18 – Promoção da Saúde. *Saude Soc.* 2014;23:180–90. doi: <https://doi.org/10.1590/S0104-12902014000100014>
19. Guimarães R, Teixeira MO. Ciência e Tecnologia e Inovação em Saúde no Brasil: reflexões e prioridades. *Physis.* 2025;35:e350121. doi: <https://doi.org/10.1590/S0103-73312025350121pt>
20. Banco Central do Brasil (BACEN). Calculadora do Cidadão [Internet]. Brasília: Banco Central do Brasil. Available from: <https://www.bcb.gov.br/meubc/calculadoradocidadao> [2025 September].
21. Kim H, Fay MP, Yu B, Barret MJ; Feuer EJ. Comparability of Segmented Line Regression Models. *Biometrics.* 2004;60:1005–14. doi: <https://doi.org/10.1111/j.0006-341X.2004.00256.x>
22. Antunes JLF, Cardoso MRA. Uso da análise de séries temporais em estudos epidemiológicos. *Epidemiol Serv Saude.* 2015;24:565–76. doi: <https://doi.org/10.5123/S1679-49742015000300024>
23. Vargas AJ, Sprow K, Lerman JL, Villani J, Regan KS, Ballard RM. Diet and Physical Activity Prevention Research Supported by the U.S. NIH From 2012–2017. *Am J Prev Med.* 2019;57(6):818–25. doi: <https://doi.org/10.1016/j.amepre.2019.07.023>
24. Fernhall B, Borghi-Silva A, Babu AS. The Future of Physical Activity Research: Funding, Opportunities and Challenges. *Prog Cardiovasc Dis.* 2015;57:299–305. doi: <https://doi.org/10.1016/j.pcad.2014.09.003>
25. Couto PC, Ell E, Figueiró AC, Oliveira Silva D. Avaliação do fomento de pesquisas em alimentação e nutrição apoiadas pelo Ministério da Saúde, de 2002 a 2017. *Cad ESP.* 2019;13:47–57. Available from: <<https://cadernos.esp.ce.gov.br/index.php/cadernos/article/view/168>> [2025 September].
26. Melo GBT, Angulo-Tuesta A, Silva EN, Obara MT. Financiamento de pesquisas sobre dengue no Brasil, 2004–2020. *Saude Debate.* 2023;47:601–15. doi: <https://doi.org/10.1590/0103-1104202313817>
27. Vieira LA, Carvalho FFB. Planejamento no SUS: a agenda das Práticas Corporais e Atividades Físicas de 2004 a 2023. *Saude Debate.* 2024;48:e8865. doi: <https://doi.org/10.1590/2358-289820241418865P>
28. Brasil. Ministério da Saúde. Plano de Ações Estratégicas para o Enfrentamento das Doenças Crônicas e Agravos não Transmissíveis no Brasil 2021–2030. Brasília: Ministério da Saúde; 2021. Available from: <https://www.gov.br/saude/pt-br/centrais-de-conteudo/publicacoes/svsa/doencas-cronicas-nao-transmissiveis-dcnt/09-plano-de-dant-2022_2030.pdf> [2025 September].
29. Negri F. Financiando a ciência e a infraestrutura de pesquisa em tempos de crise. *Rev USP.* 2022;135:101–18. doi: <https://doi.org/10.11606/issn.2316-9036.i135p101-118>
30. Hallal PC. SOS Brazil: Science under attack. *The Lancet.* 2021;397:373–4. doi: [https://doi.org/10.1016/S0140-6736\(21\)00141-0](https://doi.org/10.1016/S0140-6736(21)00141-0)
31. Carvalho FFB, Tavares GH, Pereira Filho ES. Criação da Política Nacional de Práticas Corporais e Atividades Físicas no SUS: um debate a partir do Colégio Brasileiro de Ciências do Esporte (CBCE). *Rev Bras Ciênc Esporte.* 2025;47:e20250052. doi: <https://doi.org/10.1590/rbce.47.e20250052>
32. Política nacional de atividade física e práticas corporais no SUS: a hora é agora! [Internet]. SciELO Preprints. 2025. Available from: <https://preprints.scielo.org/index.php/scielo/preprint/view/11606> [2025 September].
33. Tenório MCM, Coelho-Ravagnani C, Umpierre D, Andrade DR, Autran R, Barros MVG, et al. Physical Activity Guidelines for the Brazilian Population: Development and Methods. *J Phys Act Health.* 2022;19(5):367–73. doi: <https://doi.org/10.1123/jpah.2021-0756>
34. Iriart JAB, Deslandes SF, Martin D, Camargo Junior KR, Carvalho MS, Coeli CM, et al. A avaliação da produção científica nas subáreas da Saúde Coletiva: limites do atual modelo e contribuições para o debate. *Cad Saude Publica.* 2015;31:2137–47. doi: <https://doi.org/10.1590/0102-311X00065515>
35. Nogueira JAD, Bosi MLM. Saúde Coletiva e Educação Física: distanciamentos e interfaces. *Cien Saude Colet.* 2017;22:1913–22. doi: <https://doi.org/10.1590/1413-81232017226.23882015>

Received: 10/10/2025
 Reviewed: 03/25/2026
 Approved: 04/13/2026

Editor in Chief

Átila Alexandre Trapé 
Universidade de São Paulo, Ribeirão Preto,
São Paulo, Brazil.

Section editor

Valter Cordeiro Barbosa Filho 
Universidade Estadual do Ceará, Fortaleza,
Ceará, Brazil.

Cite this article as:

Vieira LA, Carvalho FFB, Bernardo D, Galvão LL, Andrade DR, Bocalini DS. Physical activity research: analysis of the agenda funded by the Brazilian Ministry of Health (2002–2023). Rev. Bras. Ativ. Fis. Saúde. 2026;31:e0452i. doi: 10.12820/rbafs.31e0452i

Supplementary Material

Supplementary Table 1 – Minimum and maximum nominal and deflated values per research project on physical activity and health, funded by the Ministry of Health and partners in Brazil, from 2002 to 2023.

Year	Minimum nominal value per research project (BRL)		Maximum nominal value per research project (BRL)		Minimum deflated value per research project (BRL)		Maximum deflated value per research project (BRL)	
	PA	Health	PA	Health	PA	Health	PA	Health
2002	6,590	3,055	25,602	243,590	22,342	10,358	86,800	825,858
2003	-	8,418	-	3,949,416	-	25,708	-	12,061,062
2004	9,850	2,740	97,000	10,631,100	28,050	7,803	276,233	30,274,884
2005	5,290	2,500	187,376	30,100,000	14,183	6,703	502,374	80,701,140
2006	16,881	2,209	332,500	7,772,745	43,933	5,749	865,345	20,228,886
2007	13,850	6,549	34,800	5,624,706	34,596	16,359	86,928	14,050,144
2008	6,461,284	9,138	300,000	11,989,929	15,170,738	21,456	704,383	28,151,690
2009	13,810	5,036	333,210	5,457,000	31,113	11,346	750,691	12,294,108
2010	6,160	5,600	250,048	8,862,590	13,138	11,943	533,282	18,901,407
2011	2,020,000	300,000	2,020,000	21,525,268	164,032,364	599,972	4,039,812	43,048,532
2012	11,500	8,700	191,398	6,400,000	21,793	16,487	362,706	12,128,223
2013	12,495	1,125	454,000	7,100,000	22,386	2,016	813,378	1,272,023
2014	288,600	50	720,000	3,186,939	485,241	84	1,210,580	5,358,396
2015	5,761	5,761	5,761	181,250	8,768	8,768	8,768	275,848
2016	36,428	5,878	192,160	22,000,000	51,820	8,362	273,352	31,295,526
2017	16,880	7,000	506,800	20,682,890	23,357	9,686	701,272	28,619,457
2018	13,246	1,500	94,405	9,000,000	17,616	1,995	125,551	11,969
2019	97,922	27,230	97,922	23,265,638	126,099	35,065	126,099	29,960,265
2020	25,770	269	295,537	5,352,000	31,814	332	364,848	6,607,183
2021	-	22,000	-	1,994,065	-	24,526	-	2,223,007
2022	-	5,036	-	2,454,917	-	5,301	-	2,584,285
2023	-	43,000	-	57,434,000	-	43,000	-	57,434,000
Mean	503,462	21,491	341,029	12,054,911	10,009,964	39,683	657,356	19,923,086

Legend: PA: Physical activity; BRL: Brazilian reais; Min: Minimum; Max: Maximum.

Source: Own elaboration, based on data from the research projects.

Supplementary Table 2 – Title and year of contracting of research projects on physical activity funded by the Ministry of Health and partners in Brazil, between 2002 and 2023.

N	Year	Research title
1	2002	Physical activity and promotion of healthy eating for older adults: a proposed intervention in Fortaleza, Ceará.
2	2002	Nutrition, lifestyle and prevention of chronic diseases in the Terena indigenous population.
3	2004	Primary actions in cardiovascular health: assessment of risk factors in schoolchildren.
4	2004	Aggregation of risk factors for non-communicable diseases: obesity, unhealthy diet and insufficient physical activity.
5	2004	Family aggregation in pregnant women with hypertension during pregnancy - an epidemiological study.
6	2004	Growth, body composition and physical performance of children and adolescents in the municipality of Aracaju, Sergipe.
7	2004	Deviations in gestational weight gain and the effect on reproductive health outcomes.
8	2004	Study of the evolution of growth and nutritional status of schoolchildren aged 7 to 10 years.
9	2004	Intervention study on smoking, diet and physical activity in adolescent schoolchildren.
10	2004	Overweight and obesity in a favela in the city of Recife and the impact of a Physical Education program: a randomized clinical trial.
11	2004	Physical exercise and respiratory assessment in morbidly obese adults: losses and gains.
12	2004	Dietary factors and breast cancer in Curitiba: a case-control study.
13	2004	Eating habits and nutritional status of hypertensive and diabetic patients. A contribution to the actions of controlling cardiovascular risk factors of HIPERDIA-MS in the Municipality of Flexeiras, Alagoas.
14	2004	Impact of physical activity and dietary guidance on gestational weight gain and products of pregnancy.
15	2004	Impact of diet and physical exercise on endothelial function in obese individuals at risk of Type 2 Diabetes.
16	2004	Implementation and evaluation of an obesity prevention program for adolescents in a school setting.
17	2004	Nutritional intervention in overweight and obese individuals: a randomized clinical trial.
18	2004	Lifestyle intervention in a Japanese-Brazilian population at high risk for metabolic syndrome, residing in Bauru, São Paulo.
19	2004	SIMTEL - five cities: implementation, evaluation and results of a municipal system for monitoring nutritional risk factors for chronic non-communicable diseases based on telephone interviews in five Brazilian municipalities.
20	2004	Validation and reproducibility of a 24-hour physical activity recall.
21	2005	Monitoring the implementation of the law regulating school canteens regarding the eating habits and nutritional status of schoolchildren.
22	2005	Physical activity and its relationship with the environment in the population of Jundiaí, São Paulo.
23	2005	Assessment of obesity and health determinants in the municipality of Uberaba - 2005/2006.
24	2005	Assessment of food security and physical activity in cyclist workers.
25	2005	Evaluation of the impact of two programs to encourage the adoption of a healthy eating pattern and the practice of physical activity during pregnancy and postpartum: two randomized clinical trials.
26	2005	Diagnosis of the genetic and environmental determinants of metabolic syndrome and a dietary-educational approach in Afro-descendant families in Bahia.
27	2005	Diet, physical activity, energy expenditure, and body composition: a prospective cohort study in adolescents.
28	2005	Chronic diseases and non-communicable conditions in the state of Pernambuco: prevalence and risk factors.
29	2005	Effect of lifestyle modification on cardiovascular risk factors that comprise the diagnostic criteria for metabolic syndrome, inflammatory markers, and autonomic balance: a randomized study.
30	2005	Effect of a supervised physical exercise program on health-related physical fitness, biochemical parameters, and immune function in HIV-positive individuals.
31	2005	Effect of peanuts on appetite and its relationship with the hormones leptin, insulin, and ghrelin in individuals with polymorphisms for the leptin genes and its receptor.
32	2005	Effectiveness of pelvic floor exercises during pregnancy as a preventive measure for urinary incontinence and pelvic floor muscle dysfunction.
33	2005	Frequency of healthy eating habits in the adult population of Pelotas, Rio Grande do Sul.
34	2005	Amazonian fruit trees and physical activity as aids in controlling overweight and obesity in schoolchildren.
35	2005	Impact of dietary guidance and physical activity on fetoplacental blood flow and fetal growth
36	2005	Nutritional profile and food consumption of preschool and school-aged children in two municipalities in the Jequitinhonha and Mucuri Valleys, semi-arid region of Minas Gerais.
37	2005	Nutritional profile and its relationship with the incidence of type 2 diabetes mellitus and coronary artery disease in indigenous communities of the Brazilian Amazon.
38	2005	Prevalence of obesity and its comorbidities, eating habits and physical activity practice in schoolchildren in the urban region of Maringá/PR - diagnosis and intervention.
39	2005	Prognosis of functional psychoses four years after the first contact with mental health services.
40	2005	Promoting healthy eating and lifestyles: a nutritional education project for schoolchildren - municipality of Gameleira - southern forest zone - Pernambuco.

Continue...

Continue of **Supplementary Table 2** – Title and year of contracting of research projects on physical activity funded by the Ministry of Health and partners in Brazil, between 2002 and 2023.

N	Year	Research title
41	2005	Promoting a healthy lifestyle in school-aged children and adolescents in the Federal District.
42	2005	Aerobic physical training in Chagas disease patients with heart failure.
43	2006	Economic analysis of a school-based program for the prevention of overweight.
44	2006	Body practices and primary health care: evaluating body care in basic units in the Butantã district of São Paulo.
45	2006	Evaluation of endothelial function in patients with metabolic syndrome undergoing cardiovascular rehabilitation: role of the renin-angiotensin system and oxidative stress.
46	2006	Evaluation of the impact of a physical activity program on plasma adipocytokine concentration in obese and overweight children from public schools in the municipalities of Ouro Preto and Barbacena, Minas Gerais.
47	2006	Exercise-induced bronchospasm in obese non-asthmatic adolescents.
48	2006	Present body: representations of health among quilombola communities and public policies.
49	2006	Social determinants of morbidity patterns, service use, and health-related behaviors.
50	2006	COPD: Case identification, prevention, and study of treatment response for smoking cessation and different forms of pulmonary rehabilitation within the scope of public health.
51	2006	Effect of physical exercise during pregnancy on maternal and newborn body composition: Randomized Clinical Trial.
52	2006	Effects of a physical activity program on functional capacity and quality of life in patients undergoing hemodialysis.
53	2006	Effects of physical exercise on intermittent claudication in patients with peripheral arterial occlusive disease.
54	2006	Effects of physical exercise on insulin resistance in patients with type 2 diabetes.
55	2006	Aging, chronic neurodegenerative diseases and infection in the Brazilian Amazon: neuroprotective role of physical exercise.
56	2006	Study of frailty in older Brazilians: FIBRA Network.
57	2006	Risk factors for overweight and obesity in adolescents.
58	2006	Genetic and environmental factors associated with hypertension and obesity in quilombola populations.
59	2006	Impact of nutritional intervention on users of the Brazilian public health system served by the BH-Saúde project.
60	2006	Interventions to promote a healthy lifestyle for women: a randomized controlled clinical trial.
61	2006	Investigation of dyslipidemia in the pediatric population served by the SUS, in a laboratory of the municipal network of Porto Alegre.
62	2006	Urban Health Observatory of Belo Horizonte at UFMG. Analysis of the factors conditioning the health of the population by delimited areas and formulation of intervention proposals. Project: Lifestyles, Styles and Healthy Habits in BH: an epidemiological evaluation.
63	2006	Frailty profiles in older Brazilians.
64	2006	Frailty profiles in community-dwelling older Brazilians, with emphasis on biological aspects (project part of the Research Network on Frailty Studies in Older Brazilians (Rede FIBRA)).
65	2006	Prevalence of overweight and obesity in school children and adolescents in São Luís, Maranhão.
66	2006	Communicational Processes in Public Health and the diffusion of an active lifestyle: resonances, meanings and sociocultural repercussions.
67	2006	Project Caminha Juazeiro: Longitudinal study on the impact of an intervention of a physical exercise program applied to diabetic and hypertensive patients followed by primary care.
68	2006	Rede Fibra: frailty profiles in Brazilian older residents in the community.
69	2006	Repercussions of a Health Promotion and quality of life experience for older adults served by the SUS: transdisciplinary actions in nutrition and physical activity.
70	2006	Physical training: health benefits for aging adult men.
71	2007	Determining walking capacity in obese individuals - A contribution to planning healthcare actions for obese individuals - SUS .
72	2007	Study on the Promotion of Physical Activity in Smokers (EPAFT) a randomized, crossover study on the short- and medium-term effects of a program using pedometers to increase daily physical activity in smokers.
73	2007	Anthropometric levels and body composition in schoolchildren aged 10 to 14 years from state, municipal and private schools in Campo Grande, Mato Grosso do Sul.
74	2007	Quality of life of patients undergoing bariatric surgery.
75	2008	Association between birth weight and prevalence of overweight, obesity and hypertension in schoolchildren residing in the municipality of Niterói, Rio de Janeiro.
76	2008	Evaluation of the effects of an exercise program on neuromuscular function and incidence of falls in community-dwelling older adults with low bone mass.
77	2008	Effectiveness of physiotherapy treatment with pelvic floor exercises, with or without biofeedback or electrostimulation, in women with stress urinary incontinence.
78	2008	Cardiovascular Risk Study in Adolescents – ERICA.
79	2008	Anterior dental trauma in schoolchildren aged 7 to 12 years: prevalence, associated factors and consequences.

Continue...

Continue of **Supplementary Table 2** – Title and year of contracting of research projects on physical activity funded by the Ministry of Health and partners in Brazil, between 2002 and 2023.

N	Year	Research title
80	2009	Analysis of available evidence and the effects of educational intervention on lifestyle changes in schoolchildren to reduce childhood obesity.
81	2009	Assessment of risk factors for cardiovascular diseases in children and adolescents in the municipality of Guabiruba, Santa Catarina.
82	2009	Hearts of Minas Gerais.
83	2009	Effects of a supervised physical exercise program on health-related physical fitness, biochemical parameters, and immune function in people living with HIV/AIDS.
84	2009	Aging, chronic neurodegenerative diseases, and infection in the Brazilian Amazon: implementation of new methodologies for cognitive assessment and therapeutic intervention in patients with mild to moderate cognitive decline in Alzheimer's disease.
85	2009	Study of the prevalence of overweight and obesity, risk factors and associated comorbidities in adolescents from public and private schools in the municipality of Alegre, Espírito Santo.
86	2009	Physical Exercise and Aging: volumetric analysis by magnetic resonance imaging of the hippocampus comparing groups of exercised and sedentary individuals.
87	2009	Impact of a guided physical exercise program on health promotion in older adults.
88	2009	Impact of birth size and lifestyle on serum vitamin D concentrations, metabolic risk factors, and hyperandrogenism in adolescents.
89	2009	Influence of zinc on muscle performance in young and older adults.
90	2009	Population survey on the prevalence of risk and protective factors for cardiovascular diseases in the metropolitan region of Maringá.
91	2009	Educational, physical activity, and nutritional interventions to reduce childhood obesity: a systematic review and meta-analysis
92	2009	Interventions in schoolchildren aimed at changing lifestyle habits.
93	2009	Interventions for changes in eating and sleeping habits in combating childhood obesity: a systematic review.
94	2009	Interventions aimed at changing lifestyle habits in the prevention and control of overweight and obesity in children and adolescents in the school setting, a systematic review.
95	2009	Improving care for individuals with Chagas disease: diagnosis, cure control, and alternative treatment.
96	2009	Epidemiological profile and factors associated with medication use in older adults treated by the SUS in an urban area of Northeast Brazil – Natal, Rio Grande do Norte.
97	2009	AlfaNutri Plan: a new paradigm, nutritional literacy, for the promotion of healthy eating and regular physical activity in the prevention and control of chronic diseases.
98	2009	Prevalence of signs and symptoms of peripheral arterial disease and neuropathy and exercise capacity in diabetic patients treated by the Unified Health System in the municipality of Natal.
99	2009	Multiprofessional program for the treatment of obesity and metabolic syndrome in adolescents: an intensive behavioral approach.
100	2009	Quality of life, body composition and cardiovascular adaptations in individuals after a cardiovascular prevention and rehabilitation program.
101	2009	Systematic review on the effect of educational interventions aimed at schoolchildren to reduce childhood obesity as a basis for intervention in schools in the Ceilândia-DF Regional Education District.
102	2009	Health and nutrition of children aged 7 to 10 enrolled in the elementary school system of Santa Maria de Jetibá-ES - health - Santa Maria de Jetibá.
103	2009	Metabolic Syndrome and Risk Factors in Adolescents from Cuiabá.
104	2009	Metabolic syndrome and insulin resistance in university students in São Luís, Maranhão.
105	2010	Physical alterations and late functional independence in people with ASIA spinal cord injury.
106	2010	Lifestyle and risk behaviors of young people from Santa Catarina COMPAC 2.
107	2010	High-intensity exercise and hormone replacement in patients with heart failure.
108	2010	Physical exercise for the treatment of patients with fibromyalgia syndrome.
109	2010	Management models for cardiovascular risk reduction in Primary Care in Brazil.
110	2010	Obesity control and treatment program: the contribution of different physical exercise programs.
111	2011	Health Academy.
112	2012	Evaluation of the empowerment program in diabetes mellitus education in primary care.
113	2012	Assessment of cardiometabolic risk factors and the effect of physical exercise in children and adolescents: An ongoing study.
114	2012	Aging and physical exercise: analyses of biochemical parameters and muscle functionality induced by different physical training programs.
115	2012	The lifestyle of young people and the risk of diseases related to sedentary behavior.
116	2012	Genetic variants that impact angiogenesis and associations with chronic non-communicable diseases, alcoholism, smoking, and depression in adults from the city of Montes Claros, Minas Gerais, Brazil.
117	2012	Health surveillance: risk factors for chronic conditions in Montes Claros, Minas Gerais, Brazil.
118	2013	Adherence of hypertensive patients to treatment in the municipality of Floriano.
119	2013	ADOLESCER: adolescent health in rural areas and its determinants.

Continue...

Continue of **Supplementary Table 2** – Title and year of contracting of research projects on physical activity funded by the Ministry of Health and partners in Brazil, between 2002 and 2023.

N	Year	Research title
120	2013	Healthy Eating and Oral Hygiene: A Partnership That Tastes Good!
121	2013	Environment and health in the Pyrenees region, surrounding the Federal District - A multidisciplinary approach to living and health conditions in small territories.
122	2013	Analysis of muscle fatigue in cancer patients undergoing chemotherapy.
123	2013	Analysis of the systemic oxidative and inflammatory profile after application of two exercise programs in patients with metabolic syndrome.
124	2013	Serum and molecular analyses of a double-blind, randomized intervention in obese and type 2 diabetic patients treated with omega-3 in association with high-intensity intermittent physical training.
125	2013	Application of an outpatient physical rehabilitation program in patients undergoing cancer treatment and its impact on quality of life, teaching, and health research in the State of Pará.
126	2013	Physical activity in daily life and peripheral muscle strength in smokers.
127	2013	Assessment of physical and sensorimotor functionality in patients with chronic low back pain: integrated project UNIC-UNOPAR - University General Hospital.
128	2013	Evaluation of the implementation and effectiveness of an intersectoral health promotion intervention within the Family Health Strategy in municipalities of Bahia.
129	2013	Evaluation of the Health Academy Program in the Cariri Macroregion - Ceará: subjects, practices and comprehensiveness.
130	2013	Evaluation of the effects of therapeutic exercises associated with the pompage technique on pain and balance in older women with gonarthrosis.
131	2013	Evaluation of the effects of chronic therapeutic exercise on the intestinal microbiota in obesity.
132	2013	Evaluation of programs and interventions related to physical activity in the primary health care network in the state of Pernambuco.
133	2013	Clinical and economic benefits of a home-based Cardiopulmonary and Metabolic Rehabilitation proposal for coronary patients, aiming at its viability in terms of public health.
134	2013	Sociodemographic characteristics, body composition, and lifestyle in older participants of social groups.
135	2013	Comparison of the cost-effectiveness of different types of treatments for chronic diseases in patients from Primary Health Care Units.
136	2013	Early diagnosis of obesity and overweight among adolescents through the development of mathematical modeling for estimating body density.
137	2013	Effect of physical activity on outpatient expenses of hypertensive and diabetic patients treated by the Unified Health System in Presidente Prudente: a 24-month cohort.
138	2013	Effect of 12 weeks of aerobic training on autonomic modulation in pre-pubertal children: a randomized clinical trial.
139	2013	Effects of functional electrical stimulation and inspiratory muscle training in patients with heart failure: a randomized clinical trial.
140	2013	Effects of cardiac rehabilitation on sympathetic heart activity, functional capacity, and quality of life in patients with heart failure.
141	2013	Effects of different physical training modalities on functional capacity and health-related quality of life in HIV-positive patients using antiretroviral therapy.
142	2013	Effectiveness of Health Education compared to Aquatic Physiotherapy for patients with knee osteoarthritis: randomized clinical trial.
143	2013	Effectiveness of interdisciplinary and multidimensional technologies in the healing of venous ulcers, leg pain, and self-assessment of health and quality of life of users over a six-month follow-up period in primary care.
144	2013	Effectiveness of a resistance training method on muscle strength and functional mobility in community-dwelling older adults at risk of falls: a clinical trial.
145	2013	Effectiveness of a health education program in controlling blood pressure in men
146	2013	Aging in women: a study of the most prevalent comorbidities in postmenopausal women, aiming for aging with better quality of life.
147	2013	Nutritional status, physical activity, and internet use among high school students in Rio Branco, Acre.
148	2013	Estimates on the frequency and sociodemographic distribution of risk and protective factors for chronic diseases in the State of São Paulo.
149	2013	Evolution of hypertension and cardiovascular risk factors in a small city over a twelve-year period.
150	2013	Cardiovascular risk factors in individuals with multiple sclerosis.
151	2013	Tool for monitoring frailty levels and associated factors in elderly individuals attended by the Family Health Support Center (NASF) in the municipality of São Carlos.
152	2013	Aquatic physiotherapy versus aquatic physiotherapy plus aerobic exercise for the treatment of individuals with nonspecific chronic low back pain: a randomized clinical trial.
153	2013	Identification of facilitators and barriers to cardiac prevention and rehabilitation in the state of Minas Gerais, Brazil.
154	2013	Implementation of the VAMOS Program in Primary Health Care Units in Florianópolis, SC: an analysis in different environmental contexts.
155	2013	Intervention with physical activity in a primary health care unit: UBS+ATIVA PROJECT.
156	2013	Research on the effect of a procedure associated with one of the integrative and complementary practices (auriculotherapy) of the SUS and the vibrations generated in an oscillating platform on the evolution of patients with chronic non-communicable disease (gonarthrosis).

Continue...

Continue of **Supplementary Table 2** – Title and year of contracting of research projects on physical activity funded by the Ministry of Health and partners in Brazil, between 2002 and 2023.

N	Year	Research title
157	2013	Prevalence of chronic non-communicable diseases and their risk factors in patients and caregivers at the University Hospital of the Federal University of Sergipe.
158	2013	Multiprofessional program for the treatment of obesity in adolescents: an efficacy trial.
159	2013	Healthy weight loss program: nutritional and physical activity monitoring for individuals with excess weight.
160	2013	Promoting healthy habits in older adults with diabetes: evaluation of operational groups as a therapeutic intervention.
161	2013	Diet quality and risk factors for the development of cardiovascular and metabolic diseases in adolescents from the public school system in João Pessoa - Paraíba: a longitudinal study.
162	2013	RedeNut: Evaluation of the inclusion of the Food and Nutrition Component in the care network for hypertensive and diabetic patients in Pernambuco.
163	2013	Metabolic syndrome among adolescents: prevalence and educational interventions.
164	2013	Trajectory of physical activity in adolescence and body fat at age 18
165	2013	Cross-sectional neuropsychology and mental health: assessment and intervention with older adults.
166	2014	Effects of resistance training with elastic tubes on morphological, functional, and biochemical parameters in patients with chronic obstructive pulmonary disease.
167	2014	Strategies for maintaining body balance in COPD: association of inspiratory muscle weakness and pulmonary hyperinflation with balance deficit, a controlled study.
168	2014	Population-based epidemiological study to assess risk factors and occurrence of cardiovascular disease (myocardial infarction, stroke, and cardiovascular death).
169	2015	Handgrip strength as a health biomarker in adults and older adults from Rio Branco, Acre.
170	2016	Assessment of the oxidative stress profile in patients with colorectal cancer.
171	2016	Effect of Vitamin D3 Supplementation on viral load and recovery of CD4+ T cells in HIV-infected patients on antiretroviral therapy assisted by the SUS .
172	2016	Effect of different low-cost physical exercise programs on mood indicators, cognitive function, physical activity level, cardiovascular risk, and treatment costs in patients with depressive disorders in the Brazilian public health system.
173	2016	Effect of interval training on cardiovascular and genetic risk factors in obese children and adolescents.
174	2016	Effectiveness of a multidisciplinary program in the assessment of cardiometabolic risk factors and treatment of abdominal obesity in two municipalities in northwestern Paraná.
175	2016	Electrical brain stimulation combined with therapeutic exercises in nonspecific chronic low back pain: a randomized clinical trial.
176	2016	High-frequency older adult users in primary health care: influence of expressive therapies on consultation frequency and sleep disorders.
177	2016	Impact of high-intensity physical exercise on the immunity of individuals of different age groups, supplemented or not with shark liver oil - an approach in animal and human models.
178	2016	Health, Food, Nutrition and Child Development - SAND: a cohort study.
179	2017	Assessment of the impact of contextual and individual aspects, especially the consumption of ultra-processed foods, on the evolution of obesity in users of Primary Care.
180	2017	Wheelchair basketball for people with disabilities in Mato Grosso: thermogenesis, health, sport, accessibility, and quality of life.
181	2017	Dialex.
182	2017	Effects of arginine supplementation associated with pulmonary rehabilitation in chronic obstructive pulmonary disease.
183	2017	Effects of different physical therapies and dance on clinical-functional parameters, muscle ultrasound quality, gait pendular mechanism and serum BDNF levels in people with Parkinson's disease with camptocormia or Pisa syndrome.
184	2017	Effects of a dance intervention compared to walking on cardiovascular risk markers and functional capacity in older adults.
185	2017	Efficacy and effectiveness study of long-term home-based transcranial direct current stimulation (tDCS) in fibromyalgia: a randomized, explanatory clinical trial.
186	2017	Physical exercise and nutritional education: a proposal for the population served by the Family Health Strategy.
187	2017	Determinants of weight regain after bariatric surgery performed within the Brazilian Unified Health System.
188	2017	Impact of whey protein supplementation on body composition, energy expenditure, and biochemical parameters in patients undergoing bariatric surgery.
189	2017	Implementation of an oxygen therapy service and telerehabilitation program for patients on long-term home oxygen therapy.
190	2017	Monitoring and caring for the physical and functional health of obese people.
191	2017	Epidemiological profile and implications for the quality of life of patients with chronic Chikungunya virus infection.
192	2017	Medicinal plants: the relationship between use, medicinal therapy, and oxidative stress.
193	2017	Continuation of the cohort study Morbidity and mortality in older adults and obstructive sleep apnea: Cross-sectional studies and randomized clinical trials of low-cost treatments for the prevention of cardiovascular, metabolic, neoplastic, and quality of life outcomes.

Continue...

Continue of **Supplementary Table 2** – Title and year of contracting of research projects on physical activity funded by the Ministry of Health and partners in Brazil, between 2002 and 2023.

N	Year	Research title
194	2017	Recommendations for physical activity for health based on practices developed within the Brazilian Unified Health System (SUS).
195	2017	Response to thermal shock and the ratio of intracellular to extracellular HSPA1A in leukocytes of older adults and middle-aged individuals undergoing strength training.
196	2017	Systematic Review of organizational models of public health systems for the care of childhood obesity and their effectiveness worldwide.
197	2017	High-intensity interval training and its effects on blood pressure and cardiac autonomic control in hypertensive patients.
198	2018	Assessment of isokinetic muscle parameters of the trunk and postural balance in older adults with different levels of physical activity.
199	2018	Situational diagnosis and health status: a study of hemodialysis service users in Espírito Santo.
200	2018	Effect of interferential current associated with physical exercise in fibromyalgia: a randomized clinical trial.
201	2018	Effect of unsupervised isometric handgrip training on ambulatory blood pressure in hypertensive individuals: a multicenter study.
202	2018	Effects of a pain education program in patients with chronic low back pain.
203	2018	Effects of periodized concurrent physical training on hemodynamic and biochemical variables in hypertensive older adults.
204	2018	Functional training versus traditional strength training: effects on indicators of physical fitness, quality of life, and cardiovascular health in older adults.
205	2019	Virtual Assistant for Pregnant Women: Monitoring Physical Activity.
206	2020	Analysis of quality of life and health indicators in people living with HIV in the southwest region of Goiás.
207	2020	Breast cancer in young women: mortality attributable to lifestyle factors - obesity, diet, and sedentary lifestyle.
208	2020	Cardiometabolic characteristics and factors associated with cardiometabolic risk in people living with HIV in Alagoas: an investigation for health promotion and prevention of chronic diseases.
209	2020	Nutritional, metabolic, genetic, and knowledge characterization of individuals with diabetic retinopathy.
210	2020	Cashew nut consumption as a strategy for rescuing food culture and its implications in the management of juvenile obesity: an interdisciplinary approach focusing on cardiometabolic health.
211	2020	Contribution of cardioprotective dietary guidance on obesity, inflammatory markers, and oxidative stress in obese patients who survived acute myocardial infarction and stroke treated at a referral service of the SUS in the state of Alagoas.
212	2020	Effects of a multidisciplinary intervention model on biopsychosocial parameters of people with post-COVID-19 obesity.
213	2020	Effects of a multidisciplinary intervention model on biopsychosocial parameters of people with post-COVID-19 obesity.
214	2020	Effects of a multicomponent physical exercise protocol, with or without acupuncture, on different chronic conditions and functional independence in older adults.
215	2020	Effects of resistance exercise and yoga in patients with rheumatic diseases and depression.
216	2020	Effects of physical training associated with inspiratory muscle training on functional capacity in patients with heart failure coexisting with chronic obstructive pulmonary disease: a controlled clinical trial.
217	2020	Effectiveness of a community intervention program for the treatment of obesity in children and adolescents in the shared health management of municipalities in the State of Rio de Janeiro.
218	2020	Efficacy of a whole-body vibration protocol on functional capacity, muscle strength and thickness, fall risk, functionality, balance, heart rate variability, post-traumatic stress, and quality of life in post-COVID-19 patients.
219	2020	Nutritional status, risk behaviors, and health conditions of older adults in Lafaiete Coutinho: a cohort study.
220	2020	Redox state, immunometabolism and meta-inflammation in obesity: gene expression and responses to high-intensity interval training.
221	2020	Strategy for managing excess weight in Primary Health Care.
222	2020	Interdisciplinary health education strategies for the prevention of childhood obesity.
223	2020	Determinants of physical activity during daily commutes among schoolchildren: an intersectoral and multidisciplinary approach to addressing physical inactivity and obesity.
224	2020	Impact of placebo susceptibility on the effect of transcranial direct current stimulation (tDCS) in fibromyalgia: a randomized clinical trial with extended home stimulation.
225	2020	Impact of a physiotherapy protocol in diabetics with erectile dysfunction: a randomized clinical trial.
226	2020	Incidence of arboviruses and COVID-19: a cohort study on immunity, disease burden, and impacts on quality of life and work productivity.
227	2020	New frontiers in pediatric nutritional and cardiovascular health: developing methods to assess the double burden of malnutrition and optimal cardiovascular health in low- and middle-income countries.
228	2020	The timing of prescribing physical exercise as an adjunct in the treatment of periodontitis - Clinical and animal studies.
229	2020	Optimizing the mind-body interaction through the combination of functional exercises with mindfulness: effects on the physical and cognitive function of older adults with cognitive-motor risk syndrome.
230	2020	Prevention of childhood obesity in Primary Health Care: A community-based trial in the Metropolitan Region of Vitória, Espírito Santo.
231	2020	ABRACE Project - The dose-response of strength training in women during initial treatment for breast cancer: A randomized clinical trial.

Continue...

Continue of **Supplementary Table 2** – Title and year of contracting of research projects on physical activity funded by the Ministry of Health and partners in Brazil, between 2002 and 2023.

N	Year	Research title
232	2020	RE2SCUE: Respiratory rehabilitation in COVID-19 survivors - a randomized clinical trial.
233	2020	Rehabilitation after COVID-19: implementation and evaluation of a rehabilitation program and case monitoring.
234	2020	Physical training and nutritional education as strategies to modulate the gut microbiota and metabolic, inflammatory, and cardiovascular parameters in obese schoolchildren: a collaboration for a multicenter study.

Source: Own elaboration, based on data from the Health Research repository.

Reviewers' assessment

The reviews of this article were originally conducted in Portuguese. This version has been translated using ChatGPT and subsequently reviewed by the Chief Editors.

One of the reviews was not authorized for publication by the reviewer.

Reviewer B

Jean Augusto Coelho Guimarães 

Universidade de São Paulo, Escola de Educação Física e Esporte, São Paulo, Brasil.

- Was any indication of plagiarism observed in the manuscript?
- No
- Did the authors provide clarification regarding the ethical procedures adopted to conduct the research?
- Yes

Comments to the authors

Dear authors,

The article addresses a very important and timely topic, drawing the attention of different stakeholders to the need to promote further research on physical activity in health and within the SUS. Congratulations on the progress and the highly valuable synthesis presented.

Attached are some minor comments for your consideration, including a suggestion for the methodology and small spelling corrections.

Thank you!

Comments on the text

Introduction

- Page 3, line 17: "Among other aspects?"
- Page 3, line 18: "to the policies."
- Page 6, line 8: Although it may be written this way on the website, I suggest reconsidering whether it is worth modifying the term, given the ongoing discussion on this topic, or placing it in parentheses

(people with disabilities).

Results

- Page 8, line 27: Suggestion: Would "research related to PA" be better? Since not all studies focused exclusively on PA.
- Page 8, lines 16–17: I understand the use of the annual average value to facilitate visualization of investments over time. However, since each study has a specific value, presenting a value per study may be confusing and not entirely accurate. Would it be better to report minimum and maximum values in this case? Both here and in the spreadsheet. Example: 60 thousand to 500 thousand. If this information can be identified in the platform, it would better reflect the results.
- Page 9, lines 3–4: Suggestion: "with 2008 being the year with the highest total deflated value, 2011 with the highest deflated value per study, and 2013 with the highest number of studies."

Discussion

- Page 11, line 13: I suggest placing "sedentary behavior" in quotation marks.
- Page 15, line 21: "Among other aspects?" "Axes?"

Figures

- Page 22, Figure 1: Correct the words: keywords; included; add spacing in the last boxes between numbers and the "=" symbol, as well as in the upper boxes.
- Page 27, Figure 4: Suggestion: It may be better to align all themes either to the left or center. This is because, especially when two long phrases appear close together, the layout becomes visually confusing.

Final decision

- Minor revisions required