Body practices and physical activities developed in the Primary Health Care in Brazil from 2013-2021

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Abstract: **Objective:** To map records of Body Practices and Physical Activities (PCAF) conducted in Primary Health Care in Brazil from 2013 to 2021. **Methods:** Ecological study using Primary Care Information System (SISAB) data. Annual PCAF records were presented in absolute and relative values at state, regional, and national levels, categorized by team type and target audience. **Results:** A total of 2,664,288 PCAF actions were recorded nationwide in this period. An average annual growth rate of 113.3% was observed in records between 2013-2019; however, a 75.5% reduction occurred from 2020 onwards, likely linked to the Covid-19 pandemic. The Southeast and Northeast regions recorded the highest PCAF activities, with Minas Gerais, São Paulo, Rio de Janeiro, Bahia, Ceará, Goiás, and Santa Catarina standing out. PCAF actions were primarily directed toward the general community, women, older adults, and individuals with chronic diseases. The Family Health Support Center teams and Family Health teams recorded most actions. **Conclusion:** The distribution of actions remains uneven across states and regions, highlighting the need for intersectoral strategies to strengthen PCAF and health promotion within the SUS.

➤ **Keywords:** Motor Activity. Unified Health System. Electronic Health Records. Health Information Systems.

Received on: 11/9/2023 Revised on: 5/23/2024 Approved on: 7/16/2024

DOI: http://dx.doi.org/10.1590/S0103-73312025350119en

Editor: Rogério Azize Reviewers: Fabio Carvalho and Sueyla Santos

Introduction

The National Health Promotion Policy (PNPS) marks a significant milestone in institutionalizing Body Practices and Physical Activities (PCAF) within the context of Primary Health Care (PHC), as it included this care modality among its priority areas (Brasil, 2018a). The prioritization of PCAF in the PNPS stems from the recognition that physical inactivity, associated with a higher incidence of non-communicable diseases (NCDs), is one of the leading risk factors for premature mortality worldwide (Lee *et al*., 2012; Malta *et al*., 2014; WHO, 2020a). During the pandemic, research also demonstrated that being physically active was linked to reduced likelihood of severe Covid-19 cases, lower chances of hospitalization, ICU admission, long Covid symptoms, as well as sequelae and deaths caused by the disease (Jimeno-Almazán *et al*., 2021; Latorre-Román *et al*., 2021; Sallis *et al*., 2020).

In this context, the established trajectory of PCAF in health, with several consolidated programs and existing scientific support, positions it as a form of care within the Unified Health System (Sistema Único de Saúde, SUS), particularly in PHC (Carvalho; Nogueira, 2016; Malta *et al*., 2014). However, fiscal austerity measures such as Constitutional Amendment No. 95/2016 (Brasil, 2016) and changes to PHC financing introduced by the Previne Brasil Program (2019-2024), which led to the decommissioning of Family Health Support Center (NASF) teams (Brasil, 2019; 2020), may have considerable impacts on the availability of these services, requiring ongoing monitoring and analysis (Carvalho *et al*., 2022a).

Within this scenario, health information systems (HIS) provide standardized tools for monitoring and data collection, aiming to supply information for analyzing and better understanding key public health issues and tracking and evaluating services. In PHC, the current HIS is the Primary Care Information System (SISAB), which integrates the e-SUS Primary Health Care strategy (e-SUS PHC) (Brasil, 2021a).

Mapping PCAF activities conducted in PHC at the national, regional, and state levels can contribute to identifying existing disparities, offering information to support public managers in decision-making, and directing policies to expand these actions. Although these activities' records have been publicly available in SISAB since 2013, few studies have explored this data (Manta *et al*., 2023; Carvalho *et al*., 2024a). Recent analyses have focused on PCAF activities within the School Health Program (Manta *et al*., 2023) and the provision and participation in PCAF within

PHC during 2014-2022 (Carvalho *et al*., 2024a). The latter, a time-series ecological study, analyzed the number of records and participants but did not include team types or the target audience of the activities. In this sense, significant gaps remain that allow for a more comprehensive and detailed analysis of the PCAF landscape within PHC, offering new perspectives and hypotheses for future initiatives in the field. These findings also highlight the potential for long-term monitoring of PCAF, providing an additional tool for stakeholders.

Given this context, this study aims to map the PCAF records conducted in PHC from 2013 to 2021 in the SISAB platform. This mapping describes these records based on Brazilian regions and states, health team types, and target audiences. Additionally, it enables comparisons between the pre-pandemic and pandemic periods. Furthermore, the study aims to analyze the correlation of these records with Family Health Strategy (FHS) coverage and the Human Development Index (HDI).[1]

Methods

This ecological study utilized production records stored in the SISAB as the variable of interest. These records pertain to health practices categorized as "Physical Practices and Physical Activities" (PCAF) from 2013 to 2021 across all 26 Brazilian states, the Federal District, and each geographical region (Midwest, North, Northeast, Southeast, and South). Physical practices and activities can refer to collective classes but also encompass a variety of other activities, such as lectures, therapeutic groups, small group sessions, intersectoral actions, listening, guidance, and counseling, among others.

The other variables used were:

- Target audience: general community, children (0-3 years; 4-5 years; 6-11 years), adolescents, women, pregnant women, men, families, older adults, individuals with chronic diseases, alcohol users, tobacco users, users of other drugs, people with mental distress or disorders, education professionals, and others. For better data presentation, children were grouped into a single category, while users of alcohol, tobacco, and other drugs were grouped under the category of alcohol and other drug users.
- Team type: Family Health Team (eSF), Expanded Family Health Center (NASF), Basic Care Team (eAB), Oral Health Team (eSB), Street Clinic Team (eCR), Prison Basic Care Team (eABP), and Primary Care Team (eAP).

- Family Health Strategy Coverage: Population coverage estimated by Family Health Strategy teams.
- Human Development Index (HDI): An index measuring the degree of development in a given society, composed of indicators for three dimensions: longevity (life expectancy at birth), education (schooling levels), and income (Gross Domestic Product per capita). The HDI ranges from 0 to 1, with values closer to 1 indicating higher human development in that locality.

To extract PCAF data, we used the Collective Activity Report from Primary Care, which was stored on the SISAB platform. The variables in this report originate from records made by various health professionals in the Collective Activity Form (FAC) within Simplified Data Collection (CDS), the Citizen's Electronic Medical Record (PEC), or other systems linked to SISAB (Brasil, 2021b).

The Collective Activity Report from Primary Care is available on the SISAB platform with two types of access: public and restricted, through the e-Gestor AB portal, requiring prior registration. Thus, the interest data were accessed through the SISAB online platform via https://sisab.saude.gov.br, which directed to publicly accessible data.

Filters corresponding to the geographical unit were applied to generate reports. First, Brazil was selected, followed by states, the Federal District, and finally, the regions. For each geographical unit, the reference period was determined (April 2013 to December 2021, depending on the data availability at the time of collection), the type of information regarding the number of activities conducted, and the filters for target audience and team type. All queries applied the same "Body Practices/ Physical Activities" filter for the "Health Practices" item.

We used the Historical Coverage Report on the e-Gestor portal to extract Family Health Strategy coverage data. The data in this report originate from the National Register of Health Establishments System (SCNES) and the Brazilian Institute of Geography and Statistics (IBGE). We used information from 2013 to 2019 since, starting in 2021, the system's presentation format changed, becoming the Primary Health Care Historical Coverage Report, which integrates population data registered by Family Health Teams (eSF) and Primary Care Teams (eAP). These changes reflect the new registration and funding mechanisms introduced by the

Previne Brasil program (Brasil, 2019). Furthermore, data from 2019, preceding the COVID-19 pandemic, were used due to the understanding that this situation, among other factors, might have altered population registration logistics. HDI data were obtained from the 2010 Demographic Census conducted by IBGE.

The records extracted from the SISAB, e-Gestor AB, and IBGE platforms were initially tabulated in Microsoft Excel®. Descriptive statistics were used as an initial analysis procedure, presenting annual PCAF data in absolute (n) and relative (%) terms at the national, regional, and state levels.

Based on this information, we calculated the growth percentage of records up to 2019, preceding the pandemic. The geometric growth rate formula, provided in the DATA-SUS manual for calculating average annual population growth rates (REDE, 2008), was used where: $r = \left[\sqrt[n]{\frac{P_t}{P_0}} - 1\right] * 100$, where: n = Number of years in the period (2013 to 2019 = 7 years); P_t = PCAF records at the end of the period (2019); P_0 = PCAF records at the start of the period (2013); r = Geometric growth rate, indicating the average annual growth percentage of PCAF records from 2013 to 2019 at the state, regional, and national levels. This approach also allowed for a description of PCAF records during the pre-pandemic and COVID-19 pandemic periods.

For state-level data, we calculated each location's average annual growth rate and presented the results in a table. Additionally, each state's total percentage variation (2013–2019) was calculated using the formula: $\frac{Records\ PCAF\ 2019\ -\ Records\ PCAF\ 2013}{Records\ PCAF\ 2013} * 100$. The results were displayed as a map to illustrate the distribution of records and percentage increases during the period. Data from health teams were tabulated and descriptively analyzed year by year, alongside the number of activities conducted by the target audience.

Additionally, Spearman's correlation coefficients were estimated between PCAF records, Family Health Strategy coverage indicators, and HDI. This analysis aimed not to establish associations but to identify relationships that might generate hypotheses. Statistical analyses were conducted using Stata® 16, while maps were created using QGIS® version 3.22.7.

Ethics approval was not required, as this study utilized publicly available data from electronic platforms. Thus, it complies with Resolution No. 510/2016 criteria of the National Health Council (CNS) for research involving this type of information.

Results

The data shown in Table 1 demonstrate that, between 2013 and 2021, 2,664,288 records of Physical Practices and Physical Activities were conducted in Primary Health Care nationwide. A significant increase was observed in the annual number of registered activities, starting at 3,075 in 2013 and reaching 617,383 in 2019, representing an average annual growth rate of 113.3%. From 2020 onwards, coinciding with the pandemic period, there was a reduction of approximately 75.5% in the number of PCAF records in Brazil compared to the figures from 2019. Furthermore, it is important to highlight that, in 2020 and 2021, the peak of the pandemic, the records (n=151,156 and n=164,977) were even lower than those in 2015 (n=214,275).

The findings revealed that, at the regional level, the Southeast and Northeast regions had the highest PCAF records throughout the studied years, accounting for over 70% of the activities produced in the country. In comparison, the North Region represented less than 5%. At the beginning of the analyzed period, the Northeast had the most significant number (n=1,907), accounting for 62% of the total PCAF activities conducted in the country in 2013 and approximately 43% in 2014 (n=32,970). Over the years, the Southeast region showed a considerable increase in the number of records. From 2015 onward, it surpassed the Northeast as the region with the most significant number of PCAF developed in PHC (n=85,555), being responsible for over 50% of the records of these activities until 2021 (n=89,061) (Table 1).

A timeline analysis shows growth in all regions up to 2016, followed by stability between 2016-2017, and another increase between 2017-2019, the year in which the most PCAF actions were recorded in PHC, with 342,736 in the Southeast, 139,227 in the Northeast, 66,031 in the South, 43,230 in the Central-West, and 26,159 in the North. In percentage terms, the average annual growth rate in the number of PCAF records between 2013 and 2019 was highest in the Southeast (149.0%) and North (129.1%) regions (Table 1). Additionally, as observed at the national level, starting in 2020, there was a decline in the number of records in all regions, ranging from 73.8% in the Southeast to 79.5% in the North, compared to the figures recorded in 2019 for these areas.

Table 1. Absolute and relative frequency of records of body practices and physical activities by region in the period 2013-2021 and average annual growth rate between 2013-2019. SISAB, Brazil, 2013-2021.

Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	Growth 2013-2019
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	
Midwest	206 (6.7)	3 943 (5.1)	19 644 (9.2)	31 562 (7.2)	27 474 (6.1)	39 276 (7.2)	43 230 (7.0)	9 985 (6.6)	9 006 (5.5)	114.6%
Northeast	1 907 (62.0)	32 970 (43.0)	65 840 (30.7)	91 774 (20.8)	86 209 (19.2)	113 502 (20.7)	139 227 (22.6)	29 530 (19.5)	36 491 (22.1)	84.6%
North	79 (2.6)	3 424 (4.5)	10 296 (4.8)	19 337 (4.4)	13 615 (3.0)	21 451 (3.9)	26 159 (4.2)	5 366 (3.5)	7 983 (4.8)	129.1%
Southeast	577 (18.8)	27 307 (35.6)	85 555 (39.9)	235 081 (53.4)	268 675 (59.8)	312 219 (57.0)	342 736 (55.5)	89 715 (59.4)	89 061 (54.0)	149.0%
South	306 (10.0)	9 014 (11.8)	32 940 (15.4)	62 600 (14.2)	52 984 (11.8)	61 005 (11.1)	66 031 (10.7)	16 560 (11.0)	22 436 (13.6)	115.5%
Total Country	3 075	76 658	214 275	440 354	448 957	547 453	617 383	151 156	164 977	113.3%

Caption: Growth 2013 - 2019: Average annual growth rate of PCAF registrations between 2013 and 2019
Source: own elaboration.

The state panorama shows that the places that registered the most PCAF in PHC in total during the period investigated were Minas Gerais (n=964,577), São Paulo (n=323,939), Rio de Janeiro (155,306), Bahia (138,773) and Santa Catarina (n=124,987). Looking at the distribution over time, it can be seen that in 2013, registrations ranged from zero in the Federal District, Mato Grosso do Sul, Acre, Rondônia, Roraima, Tocantins, and Espírito Santo, to 515 in Bahia, considering the month of April of the respective year. 2019, this figure was much higher, ranging from 530 in Roraima to 230,522 in Minas Gerais. In 2021, the last year analyzed, registrations ranged from 40 in Roraima to 59,574 in Minas Gerais (Table 2).

As for the average annual growth rate of the states between 2013-2019, the highest rates were in Rio de Janeiro (345.8%), followed by Mato Grosso do Sul (260.0%), Tocantins (251.4%), Espírito Santo (198.3%), Mato Grosso (197.9%) and Acre (192.4%). On the other hand, the lowest annual rates were in Rio Grande do Norte (62.4%), followed by Amapá (71.1%), Alagoas (75.7%) and Paraíba (76.7%) (Table 2).

Table 2. Records of body practices and physical activities by state in the 2013-2021 period. SISAB, Brazil, 2013-2021.

State	2013	2014	2015	2016	2017	2018	2019	2020	2021	Growth % 2013-2019
Acre	0	45	303	1 373	1 551	1 611	1 828	435	391	192.4%
Alagoas	248	2 096	3 721	8 335	6 335	10 792	12 828	2 633	2 801	75.7%
Amapá	13	230	454	1 285	925	642	557	145	474	71.1%
Amazonas	13	478	1 967	3 598	2 098	4 335	5 970	754	1 018	140.0%
Bahia	515	9 055	16 536	21 365	18 911	27 925	32 530	5 515	6 421	80.8%
Ceará	71	1 353	8 864	14 816	14 545	18 286	27 807	6 057	8 250	134.6%
Distrito Federal	0	0	1	163	516	1 835	1 551	340	498	185.7%
Espírito Santo	0	57	446	1 017	820	1 813	2 103	301	547	198.3%
Goiás	202	2 731	15 840	20 052	13 919	23 056	25 508	6 200	5 184	99.6%
Maranhão	167	4 072	6 156	6 973	7 368	9 334	13 090	2 352	3 709	86.5%
Mato Grosso	4	496	1 894	6 514	7 192	8 216	8 329	1 834	1 408	197.9%
Mato Grosso do Sul	0	716	1 909	4 833	5 847	6 169	7 842	1 611	1 916	260.0%
Minas Gerais	378	17 786	53 829	154 120	174 496	212 381	230 522	61 491	59 574	150.0%
Pará	53	1 119	2 384	4 503	4 126	7 559	9 714	2 395	3 157	110.5%
Paraíba	229	5 360	12 060	12 219	11 379	12 247	12 340	3 340	4 391	76.7%
Paraná	65	2 935	10 807	15 531	15 129	16 342	17 984	5 519	6 884	123.3%
Pernambuco	262	5 770	7 433	12 768	11 229	16 128	18 250	3 929	3 736	83.3%
Piauí	30	1 317	4 414	7 399	7 003	7 938	8 475	2 070	2 906	123.9%
Rio de Janeiro	1	621	6 904	28 055	33 775	32 542	34 970	8 167	10 271	345.8%
Rio Grande do Norte	347	3 617	5 594	6 570	7 644	8 644	10 341	2 833	2 564	62.4%
Rio Grande do Sul	41	2 972	12 597	21 333	16 540	18 710	22 953	5 193	7 354	146.9%
Rondônia	0	12	213	1 486	374	733	944	153	1 135	166.1%
Roraima	0	1	139	163	402	534	530	45	40	145.1%
Santa Catarina	200	3 107	9 536	25 736	21 315	25 953	25 094	5 848	8 198	99.4%
São Paulo	198	8 843	24 376	51 889	59 584	65 483	75 141	19 756	18 669	133.6%
Sergipe	38	330	1 062	1 329	1 795	2 208	3 566	801	1 713	91.3%
Tocantins	0	1 539	4 836	6 929	4 139	6 037	6 616	1 439	1 768	251.4%

Caption: Growth 2013 - 2019: Average annual growth rate of PCAF registrations between 2013 and 2019
Source: own elaboration.

From another perspective, Figure 1 illustrates the total percentage change in PCAF registrations in Brazilian states between April 2013 and December 2019, the period leading up to the Covid-19 pandemic. As already noted, all states showed significant growth. However, the most significant total percentage increases were in Minas Gerais (23,052,100%), São Paulo (7,514,000%), Rio de Janeiro (3,490,900%), Bahia (3,252,900%), Ceará (2,780,600%), Goiás (2,550,700%) and Santa Catarina (2,509,300%), indicated by the darker colors on the map. The states with the lowest percentage growth (below 100,000%) were Roraima (53,000%), Amapá (55,600%) and Rondônia (94,300%). It should be noted, however, that the percentage growth in 2019 compared to 2013 considers that in 2013, only 9 months were considered (from April to December), while in the other years of the historical series analyzed, the entire 12 months were considered.

Figure 1. Mapping of the percentage variation in records of body practices and physical activities in Brazilian states between 2013 and 2019. SISAB, Brazil, 2013-2021

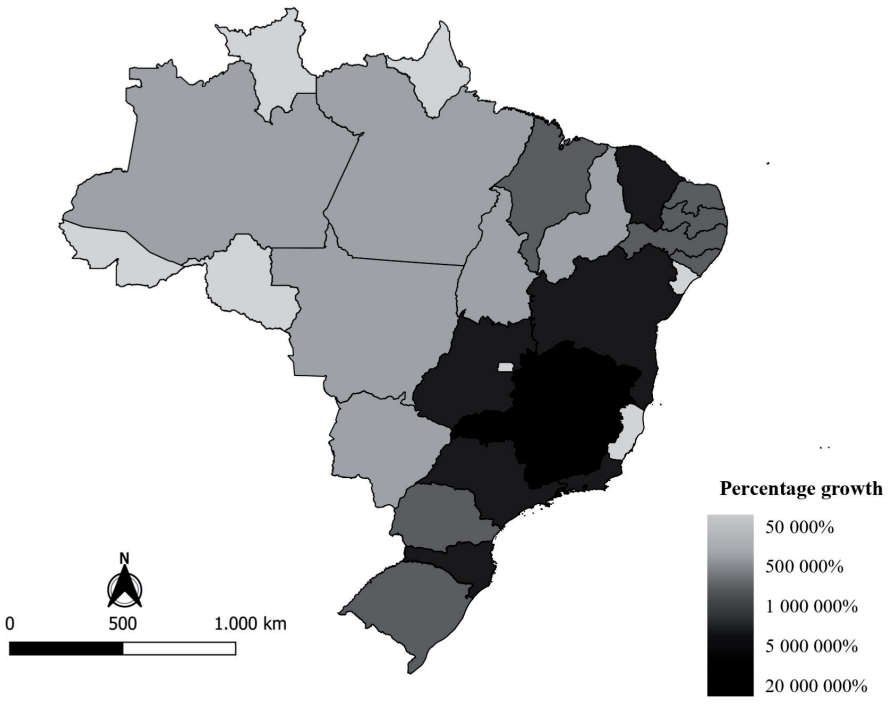


Table 3 shows that PCAFs are carried out by various PHC teams. The most significant numbers are seen in the eSF and NASF teams, totaling 2,645,045 activities registered in Brazil. In 2013, the eSF and NASF teams registered 1,685 and 1,361 PCAF, respectively. In 2019, the year with the highest recorded productivity, there were 122,369 actions carried out by the eSF and 490,840 by the NASF, the latter being the biggest promoter of PCAF in PHC throughout the period analyzed, reaching 77.1% of records across the country in 2020 and 67.8% in the total of activities for the period. Although the Prison Primary Care and Street Clinic teams serve a considerably smaller population, they still record few PCAF actions, representing less than 1% of what is developed across the country. Finally, it is worth mentioning that the way data is presented in SISAB changed in 2020 when the Primary Care Team ceased to exist, and from 2021 onwards, it was renamed the Primary Care Team.

Table 3. Absolute and relative frequency of records of body practices and physical activities by type of team in the period 2013-2021. SISAB, Brazil, 2013-2021

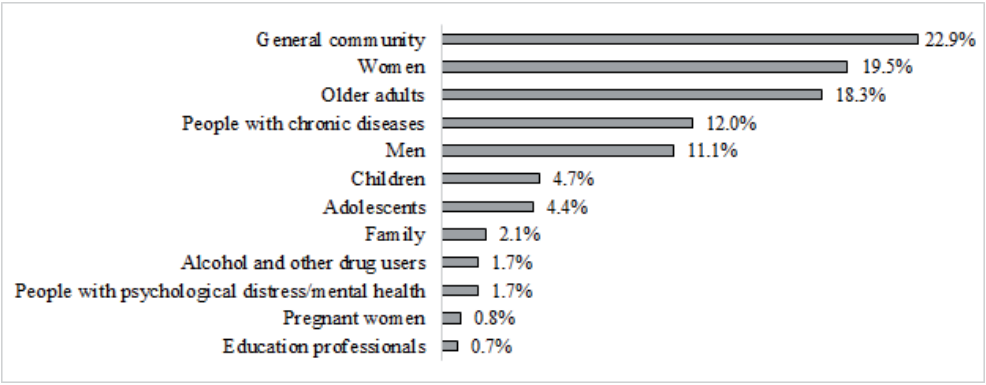
Equipe	2013	2014	2015	2016	2017	2018	2019	2020	2021
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
eAB	0	8 (0.01)	105 (0.04)	274 (0.05)	228 (0.04)	355 (0.06)	688 (0.1)	82 (0.05)	0
eABp	0	0	9 (0.004)	105 (0.02)	85 (0.02)	72 (0.01)	70 (0.01)	9 (0.01)	46 (0.03)
eACS	40 (0.9)	652 (0.7)	2 109 (0.8)	2 794 (0.6)	2 164 (0.4)	2 030 (0.3)	3 266 (0.5)	385 (0.2)	0
eAP	0	0	0	0	0	0	0	83 (0.05)	1 455 (0.9)
eCR	0	7 (0.01)	29 (0.01)	212 (0.04)	76 (0.01)	89 (0.01)	160 (0.02)	15 (0.01)	53 (0.03)
eSB	1 346 (30.4)	17 757 (18.8)	38 726 (15.3)	65 974 (13.0)	60 274 (11.8)	67 327 (10.9)	79 449 (11.4)	10 405 (6.4)	1 519 (0.9)
eSF	1 685 (38.0)	24 075 (25.5)	59 954 (23.7)	115 397 (22.8)	103 864 (20.4)	107 961 (17.6)	122 369 (17.6)	25 970 (16.1)	44 729 (27.1)
NASF	1 361 (30.7)	51 917 (54.9)	152 086 (60.1)	321 596 (63.5)	342 546 (67.2)	436 979 (71.1)	490 840 (70.4)	124 541 (77.1)	117 175 (71.0)
Total Country	4 432	94 416	253 018	506 352	509 237	614 813	696 842	161 490	164 977

Captions: eAB = Primary Care Team; eSF = Family Health Team; NASF = Expanded Family Health Center; eACS = Community Health Agents Team; eCR = Street Clinic Team; eSB = Oral Health Team; eABp = Basic Prison Team. eAP = Primary Care Team.

Source: own elaboration.

Figure 2 shows the percentages of PCAF records for each target audience over the entire period. It can be seen that the highest number of PCAFs was directed at the community in general (22.9%), followed by women (19.5%), the elderly (18.3%), people with NCDs (12.0%) and men (11.1%). There was a low percentage of registrations for children and adolescents (4.7% and 4.4% respectively). It is worth noting that the rest of the target audience does not represent 10% of the total number of activities carried out in the period analyzed.

Figure 2. Accumulated percentage of physical activity and body practices records by target audience. SISAB, Brazil, 2013-2021



The complementary analysis showed no statistically significant correlation between the HDI indicator and PCAF records in PHC in any year of the period analyzed. Significant positive correlations ($p<0.05$) existed between the percentage of FHS coverage and PCAF records in all the years analyzed except 2018. The coefficients ranged from $p=0.53$ in 2014 (moderate correlation) to $p=0.39$ in 2015 (weak correlation), and show that the higher the FHS coverage, the higher the records of PCAF in PHC.

Discussion

An average annual growth rate of 113.3% was observed in the records of Physical Practices and Physical Activities (PCAF) developed in Primary Health Care (PHC) across the country between 2013 and 2019. However, starting in 2020, there was a sharp decline in the number of records (75.5%) compared to 2019. Regionally, the Southeast and Northeast regions stood out as the most significant promoters of PCAF, while the

North region recorded the lowest numbers. The Brazilian states of Minas Gerais, São Paulo, Rio de Janeiro, Bahia, Ceará, Goiás, and Santa Catarina remained the primary producers of PCAF in the country, with the highest total percentage growth observed. Regarding the average annual growth rate, the states of Rio de Janeiro, Mato Grosso do Sul, Tocantins, Espírito Santo, Mato Grosso, and Acre were particularly prominent. Regarding the target audience, the activities primarily reached the general population, followed by women, the elderly, people with chronic non-communicable diseases (NCDs), and men, accounting for 83.8% of the total records. The health teams that recorded the most were those from the Family Health Strategy (eSF) and the Primary Care Support Teams (NASF), with the latter being the most prominent promoter of PCAF in PHC, accounting for about 67.8% of all records during the analyzed period. Furthermore, a positive and statistically significant correlation was observed between PCAF records and Family Health coverage between 2013 and 2019, except for 2018. The highest coefficient was observed in 2014 ($p = 0.53$).

It is evident that PCAF gained ground in health promotion actions in PHC during the investigated period, which appears to be linked to the creation of public policies, particularly the inaugural publication of the National Health Promotion Policy (PNPS) in 2006, which prioritized PCAF as a key area and consequently facilitated the expansion of these activities as a form of care within the Unified Health System (SUS) (Carvalho *et al*., 2022a; Malta *et al*., 2014). Additionally, between 2005 and 2018, various movements and actions took place at all three levels of SUS management, aimed at strengthening PHC and health promotion, as well as expanding the PCAF focus within the Health Care Network (RAS) and incorporating physical education professionals, especially in multidisciplinary teams (Carvalho *et al*., 2022a; Carvalho; Nogueira, 2016; Malta *et al*., 2014).

The decline in PCAF records in 2020 and 2021, observed across all Brazilian regions and states, seems to be linked to the pandemic context since March 2020. Given the alarming epidemiological situation caused by the pandemic and following the recommendations of the World Health Organization (WHO), health services suspended collective activities and redirected their efforts to Covid-19 prevention and care for patients with respiratory symptoms (WHO, 2020b). This concerning scenario, coupled with changes in primary care policy, particularly the implementation of the Previne Brasil model (Brasil, 2019), may have contributed to the sharp reduction in PCAF activities developed within PHC.

However, despite the considerable decrease in records, it must be acknowledged that even in an adverse context, health teams sought alternatives, such as teleconsultations, video lessons, and messaging groups, to maintain these activities and preserve the bond with users (Becchi *et al*., 2021; Novaes *et al*., 2020; Oliveira *et al*., 2020). It is recommended that these strategies continue to be encouraged within health services, as they can expand the availability of these actions and improve population access (Becchi *et al*., 2021; Oliveira *et al*., 2020).

In addition to the conditions imposed by the pandemic, the reduction in health promotion actions, and this case, PCAF offerings, seems also to be linked to the intensification of neoliberal measures in recent years, particularly since 2016 (Carvalho *et al*., 2022a; Palma *et al*., 2021). It is important to highlight that neoliberalism is characterized as a political rationality that promotes the primacy of the market and, in the Brazilian context, manifests as a set of political-legal initiatives aimed at fostering a society based on competition, reflecting the dynamics in which the market regulates government practices, limiting its autonomy (Menezes; Moretti; Reis, 2019). This perspective emphasizes that neoliberalism has multiple facets, including discursive aspects and measures resulting in the freezing of social investments (Menezes; Moretti; Reis, 2019; Carvalho *et al*., 2022a; Palma *et al*., 2021).

We must recognize the complexity of analyzing these factors without the necessary historical distance from significant events such as government changes, impeachment, public spending cuts (Constitutional Amendment 95), alterations in the financing model (Previne Brasil), and the Covid-19 pandemic. On the one hand, government actions such as guides and recommendations were promoted to encourage individuals to care for themselves, focusing on individual responsibility and motivation, without addressing neoliberalism as rationality (Brazil, 2021c; 2021d; Knuth; Carvalho; Freitas, 2020). On the other hand, the aforementioned modifications in terms of budget freezes and changes in health financing are clear examples of setbacks in health policies (Brazil, 2016; 2019; 2020; Carvalho *et al*., 2022a; 2024b).

It is important to note that we still lack sufficient historical data to precisely determine the potential impacts of the Previne Brasil program and a possible reduction in PCAF activities within PHC. However, even though we cannot establish a direct causal relationship, it is necessary to point out that this financing model contributed to the reduction in the number of teams and the number of Physical

Education professionals working in SUS (Dutra; Viero; Knuth; 2023; Carvalho *et al*., 2024b). These factors reinforce our hypothesis that these changes may also hinder the provision of PCAF activities in SUS. Such measures have imposed weaknesses in maintaining, continuing, and fostering the policies and programs discussed here. Persistent social inequalities in the country are exacerbated by the neoliberal logic of disarticulating health policies in a general sense, affecting PCAF, and through such actions, it is possible to observe coordinated movements aiming at the underfunding and dismantling of SUS or reducing SUS to a limited set of services (Knuth; Antunes, 2021). From this perspective, a logic emerges in which social policy is no longer practiced to realize rights but rather to deepen existing inequities and regulate access to services based on individuals' purchasing power (Menezes; Moretti; Reis, 2019; Palma *et al*., 2021).

Given that neoliberal rationality can take many forms (Menezes; Moretti; Reis, 2019; Carvalho *et al*., 2022a; Palma *et al*., 2021), even an increase in records of PCAF may raise concerns, as such records may align with a focus on physical activity counseling without addressing the underlying causes that influence it, thus oversimplifying the issue. To avoid this simplification, counseling must be conducted holistically, addressing not only physical activity but also the socioeconomic, cultural, and emotional factors that influence it. It is essential to create an environment that encourages and values continuous self-care and prioritizes person-centered care, moving beyond generic advice and constructing and maintaining a professional-user relationship while broadening the understanding of physical activity counseling. Moreover, the adoption of structured counseling models, such as the 5As model (Ask, Assess, Advise, Assist, Arrange), along with other intersectoral actions, can strengthen the effective follow-up of users and the evaluation of actions developed within the SUS (Moraes *et al*., 2024).

A 2009 study aimed at describing the PNPS and the physical activity agenda within SUS raised the issue of improving the population's quality of life and highlighted that the main challenge for SUS managers was "ensuring sustainability for the promotion of physical activities and continuous intersectoral dialogue for improving urban spaces and structures that support physical activity" (p. 85) (Malta *et al*., 2009). About 13 years after this publication, the challenge remains the same. In light of worsening social indicators observed in the country, it is important to emphasize that PCAF are not detached from this scenario, as they are complex

manifestations shaped by socioeconomic, cultural, and political conditions and ways of life (Knuth; Antunes, 2021).

In the findings of this study, the most populous regions, such as the Northeast and Southeast (IBGE, 2021), recorded the highest numbers of PCAF in PHC, while the North, with lower population density (IBGE, 2021), remained the region with the fewest records, although it showed a considerable percentage increase. However, we found no statistically significant correlation between the Human Development Index (HDI) and PCAF records in PHC in any year of the analyzed period. It is worth noting that despite registering fewer PCAF compared to the Northeast and Southeast, the North region has a slightly higher HDI than the Northeast (0.667 in the North versus 0.663 in the Northeast), while the Southeast shows an even higher HDI (0.766) (PNUD, IPEA, 2016). However, these results must be interpreted cautiously, considering the factors influencing access to healthcare programs, including infrastructure issues, local health policies, and demographic characteristics. Thus, the absence of correlation with the HDI highlights the need for a broader, more contextualized approach when analyzing regional health disparities, acknowledging the complexity of the social and economic determinants that shape access to healthcare services and physical activity promotion programs.

In addition to population and development issues, part of the explanation for these aspects lies in the historical existence of programs promoting PCAF, which have proven successful in increasing access to these spaces and improving population-level physical activity (Ferreira *et al*., 2019). Notable examples include the Agita São Paulo program (SP), the Exercise Guidance Service in Vitória (ES), the Saúde Ativa Rio Claro program (SP), and the Academia da Cidade program in Belo Horizonte (MG) in the Southeast. In the Northeast, the Academia da Cidade program is implemented in Recife (PE) and Aracaju (SE) (Becker; Gonçalves; Reis, 2016; Ferreira *et al*., 2019; Skowronski, 2014; Vieira *et al*., 2020). Furthermore, the historical inequality in other social and health indicators between regions, especially in the North (Albuquerque *et al*., 2017; IBGE, 2020), is also evident in the findings.

Within PHC, one of the leading health promotion strategies is the Academia da Saúde program (PAS), created in 2011, which is present in 48% of Brazil's 5,570 municipalities, with 3,821 active hubs across all states (Skowronski, 2014; Brasil, 2018b; Manta *et al*., 2020). Regional data on PAS show that the regions with the highest percentage of active hubs relative to the number of municipalities were the

North (55.3%) and Northeast (54.7%), while the Southeast region had the lowest percentage (37.9%) (Brasil, 2018b).

Data from the 2013 National Health Survey demonstrated that physical activity in public programs is more prevalent in the North, Northeast, and Midwest regions. However, the overall population coverage of these programs remains low (1.9%) (Ferreira *et al*., 2019). In contrast, our study found lower proportions of PCAF records in SISAB in the North, followed by the Midwest region. It is important to note some differences between the findings, such as the type of research conducted—population survey versus ecological study—and the focus on individuals versus records. Still, it cannot be ruled out that a portion of PCAF offered to the population is not recorded to the same extent, with possible regional variations. Surveys and ecological studies provide distinct but complementary responses, and both can contribute to the development of PCAF within SUS, particularly in understanding existing inequities.

A Brazilian study found that between September 2018 and August 2019, approximately 807,000 collective activities were recorded by PHC teams, 76.6% of which were related to PCAF, serving 3,638,857 participants (Bortolini *et al*., 2020). Still, to minimize regional and state disparities, initiatives at the SUS management level are necessary to analyze the characteristics of the RAS and other intersectoral policies in these areas, intending to increase population access and ensure PCAF actions as a tool for equitable health promotion (Ferreira *et al*., 2019).

An interesting point to highlight is that the target audience for collective activities involving PCAF identified in the present study mirrors the profile of users in public PCAF programs identified in previous studies: women over 50 years old with a history of chronic non-communicable diseases (DCNT) (Silva *et al*., 2020; Silva; Prates; Malta, 2021; Souza Neto *et al*., 2020). Thus, it appears that PCAF actions are being directed toward those who most need and benefit from them, as they expand access to physical activity for women, who are less physically active than men, contribute to the reduction of DCNT-related health issues, and improve autonomy and quality of life, both among the elderly and other populations (Ferreira *et al*., 2019; Souza Neto *et al*., 2020; Vagetti *et al*., 2017).

NASF and eSF teams were the most prominent promoters of PCAF within PHC. Significant positive correlations were also observed between the Family Health Strategy (eSF) coverage rates and PCAF records in all years analyzed, except for 2018. These findings suggest that the presence and expansion of eSF may play a key

role in promoting PCAF actions in PHC, in line with the study by Florindo *et al*. (2016), which found a higher prevalence of physical activity promotion actions in municipalities with broader eSF coverage and NASF teams with physical education professionals. It should be considered that NASF, since its establishment in 2008, has enhanced the reach, quality, and effectiveness of PHC actions in line with the integrative care model (Almeida; Medina, 2021; Brocardo *et al*., 2018). However, the withdrawal of federal funding, which led to the disqualification of these teams (Brasil *et al*., 2020), poses significant challenges and disrupts work that, despite its limitations, contributed to the structuring and strengthening of PHC in Brazil and the assistance provided to individuals (Almeida; Medina, 2021; Brocardo *et al*., 2018).

Between 2019 and 2022, the General Coordination of Physical Activity Promotion and Intersectoral Actions (CGPROFI) was established, along with federal financial incentives for implementing physical activity actions within PHC (Carvalho *et al*., 2022b, 2022a). Initial analyses of the Physical Activity Incentive (IAF) demonstrate the potential to increase the population's access to PCAF in PHC (Carvalho *et al*., 2022b). However, the creation of the coordination and implementation of the incentive requires further attention, as these movements alone are not sufficient to ensure the strengthening of the PCAF agenda within SUS (Carvalho *et al*., 2022a, 2022b), as the IAF is a model that has not yet been evaluated within the Brazilian context (Carvalho *et al*., 2022b). Furthermore, little progress will be made if health promotion concepts remain tied to individual motivation without considering the social, political, economic, and cultural contexts in which individuals live (Carvalho *et al*., 2022a). Therefore, it is suggested that specific studies focus on budget, conceptual definition, and the actions of CGPROFI and IAF monitoring, as well as their implications within the Health sector.

It is important to note that this study has limitations. First, the records of PCAF, the context of the pandemic, and changes in PHC policies are contemporary events; however, this research cannot establish cause-and-effect relationships; instead, it focuses on describing these events. In this regard, it is also important to emphasize the inability to infer causality from the correlations observed in the complementary analysis, as these are based on different data sources collected for different purposes. Therefore, this is an exploratory analysis. Additionally, this study did not include a specific analysis of the number of health units and teams, although it considered the percentage of the population covered by eSF.

Furthermore, it should be considered that information systems may have operational weaknesses in terms of platform standardization, regulation, and data compatibility (Almeida; Alencar, 2000), as well as issues related to professional difficulties in registering data due to insufficient digital infrastructure, limited computers, poor internet access, and lack of knowledge regarding proper data entry and management (Lima; Vale; Pisa, 2018; Pinheiro *et al*., 2016). The implementation of the e-SUS PHC strategy in Brazil was fully implemented in only 20.2% of Brazilian municipalities by 2019, with the majority still in the initial or partial implementation stages (Cielo *et al*., 2022). Further analyses at the state and regional levels are essential for comparison with national data. It is crucial that information systems are compatible and converge to avoid overlap or gaps in records. Additionally, efforts must be made to ensure that regions have the same access to quality internet and equipment so that records reflect services rather than technical or operational difficulties.

Although the SISAB may present potential inaccuracies due to the factors above, it is a system linked to DATASUS that collects, processes, and disseminates official information from the Ministry of Health (Brazil, 2021a). The development of studies in this field makes it possible to enhance the quality of the information gathered and enables the SISAB platform to be used as a research source for future studies. Moreover, when investigating data related to SUS, it can be identified as both a locus for care production and knowledge production.

The results contribute to identifying the distribution of PCAF records and the existing disparities at the regional and state levels. Increases were observed in all regions and states until 2019, with a decline in actions from 2020 onwards, possibly related to the pandemic context and the adoption of neoliberal measures by the federal government. These findings highlight the need for strategies to be developed at all three levels of SUS management, aiming for more significant investment in public policies to maintain and create proposals and programs that expand the availability of PCAF actions across Brazil, as well as promote greater access for the population to this form of health care. Finally, this study is limited to presenting the number of PCAF records produced in PHC. Future research should evaluate whether these records reflect effective actions and assess the population coverage of these collective activities.[2]

Acknowledgements

The author RPD is a recipient of a social demand grant from the Coordination for the Improvement of Higher Education Personnel (CAPES), process number 88887.628163/2021-00.

This work was carried out with the support of the Coordination for the Improvement of Higher Education Personnel - Brazil (CAPES) - Funding Code 001.

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Notes

[1] This article is the result of Rinelly Pazinato Dutra's master's dissertation, under the supervision of Alan Goularte Knuth.

[2] R. P. Dutra: conception, data collection and analysis, writing and preparation of the manuscript. A. G. Knuth: data analysis, drafting and revising the article. All the authors reviewed and approved the content of the manuscript.

Resumo

Práticas corporais e atividades físicas desenvolvidas na Atenção Primária à Saúde no Brasil entre 2013 e 2021

Objetivo: Mapear os registros de Práticas Corporais e Atividades Físicas (PCAF) desenvolvidas na Atenção Primária à Saúde no Brasil entre 2013-2021. **Métodos**: Estudo ecológico que utilizou dados do Sistema de Informação da Atenção Básica (SISAB). Foram apresentados os registros de PCAF anualmente em valores absolutos e relativos nos estados, regiões e no país e de acordo com o tipo de equipe e público-alvo. **Resultados**: Foram registradas nacionalmente2.664.288 ações de PCAF em todo o período. Observou-se uma taxa média de crescimento anual de 113,3% nos registros entre 2013-2019, porém, houve redução de 75,5% a partir de 2020, possivelmente atrelada à pandemia da Covid-19. As regiões que mais registraram PCAF foram Sudeste e Nordeste, e os estados de Minas Gerais, São Paulo, Rio de Janeiro, Bahia, Ceará, Goiás e Santa Catarina. As ações de PCAF foram direcionadas principalmente para a comunidade em geral, mulheres, idosos e pessoas com doenças crônicas. As equipes do Núcleo Ampliado de Saúde da Família e Saúde da Família registraram a maioria das ações. **Conclusão**: A distribuição das ações ainda é desigual em âmbito estadual e regional, o que torna necessário haver estratégias intersetoriais de fortalecimento das PCAF e da promoção da saúde no SUS.

➤ **Palavras-chave:** Atividade motora. Sistema Único de Saúde. Registros eletrônicos de saúde. Sistemas de Informação em Saúde.