

# Distribution of physiotherapy professionals and services in public health in Goiás: coverage according to socioeconomic variables

*Distribuição dos profissionais e serviços de fisioterapia na saúde pública em Goiás: cobertura assistencial de acordo com variáveis socioeconômicas*

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## Abstract

**Introduction:** Public health in Brazil goes beyond social production, with an expanded view of health. Its complex structure includes physical therapy. **Objective:** To characterize physical therapy in Goiás based on the National Registry of Health Facilities (CNES in Portuguese). **Methods:** Data on specialty, municipality, place of employment, working hours, employment relationship, type of contract and establishment, number of physical therapists, administrative setting, macroregion and health region were tabulated. The following were correlated: municipal population; people dependent on the National Health System (SUS in Portuguese); municipal per capita gross domestic product (GDP); municipal Human Development Index (HDI); percentage of inhabitants dependent on the municipal SUS; number of people covered by municipal physiotherapy (NPCAF). **Results:** In the CNES, (reference July/2019) in Goiás, we found 2,187 physiotherapists in public/private facilities, in 3,353 workplaces. In establishments that serve the SUS, we identified 1,673 physiotherapists in 2,436 workplaces, 32.9% of which are linked to primary and 67.1% to specialized care. The weekly workload was 38 hours and 26 hours per workplace. Only 30.1% of the municipalities had adequate NPCAF. Health regions and macroregions had inadequate coverage. The NPCAF showed an inverse correlation with GDP ( $r = -0.20$ ;  $p < 0.001$ ) and HDI ( $r = -0.14$ ;  $p = 0.02$ ) and a direct correlation with the population ( $r = 0.46$ ;  $p < 0.001$ ). **Conclusion:** Goiás has inadequate coverage in 69.9% of the municipalities, in the macroregions and health regions. Expanding the number of workplaces available to physiotherapists is essential to achieve universal and comprehensive health care, reducing inequity and favoring equitable distribution.

**Keywords:** Community health. Physiotherapy. Public health.

## Resumo

**Introdução:** A saúde pública no Brasil encontra na saúde coletiva uma transcendência com a produção social, com olhar ampliado à saúde. Na sua complexa estrutura, oferta assistência fisioterapêutica. **Objetivo:** Caracterizar a fisioterapia em Goiás a partir do Cadastro Nacional de Estabelecimentos de Saúde (CNES). **Métodos:** Tabularam-se dados de especialidade, município, estabelecimento laboral, carga horária, vinculação, tipo de contrato e estabelecimento, número de fisioterapeutas, esfera administrativa, macrorregião e região de saúde. Correlacionou-se: população geral municipal; pessoas dependente/Sistema Único de Saúde (SUS); Produto Interno Bruto (PIB) per capita municipal; Índice de Desenvolvimento Humano (IDH) municipal; percentual populacional de habitantes dependentes do SUS municipal; número de pessoas cobertas por assistência fisioterapêutica (NPCAF) municipal. **Resultados:** No CNES, referência julho/2019, foram encontrados 2187 fisioterapeutas em estabelecimentos públicos/privados de Goiás, em 3353 postos de trabalho. Nos estabelecimentos que atendem ao SUS foram detectados 1673 fisioterapeutas em 2436 postos de trabalho, sendo 32,9% vinculados à atenção básica e 67,1% à atenção especializada. A carga horária semanal foi de 38 horas e por postos de trabalho, 26 horas. Apenas 30,1% dos municípios tinham NPCAF adequados. As regiões e macrorregiões de saúde apresentaram cobertura inadequada. O NPCAF apresentou correlação inversa com o PIB ( $r = -0,20$ ;  $p < 0,001$ ) e IDH ( $r = -0,14$ ;  $p = 0,02$ ) e direta com a população ( $r = 0,46$ ;  $p < 0,001$ ). **Conclusão:** Goiás apresenta cobertura deficitária em 69,9% dos municípios, nas macrorregiões e regiões de saúde. Expandir postos de fisioterapia é fundamental para a efetivação da universalidade e integralidade da atenção à saúde, reduzindo iniquidade e favorecendo distribuição equânime.

**Palavras-chave:** Saúde coletiva. Fisioterapia. Saúde pública.

## Introduction

Public health in Brazil is provided via the National Health System (SUS in Portuguese) and faces problems due to its complexity and the size of the country itself.<sup>1</sup> Its function is health promotion and surveillance, vector control and sanitary education, in addition to ensuring continuing primary, specialized outpatient and hospital care.<sup>2</sup>

The SUS Department of Informatics (Datusus) has a database that organizes and systematizes the different

health information systems, in terms of outpatient production, infrastructure and the human resources of the health units, such as the National Registry of Health Facilities (CNES).<sup>3-6</sup>

In the public health care setting, physiotherapy has gradually gained recognition, but remains little known and underused by the population. The distribution of these professionals within the SUS is irregular, which creates a gap in certain regions in terms of access to this service. This makes it difficult to ascertain the relevance of physiotherapy to/in the quality of public health care and SUS coverage.<sup>7,8</sup>

According to Matsumura et al.,<sup>9</sup> the World Health Organization (WHO) recommends a ratio of one physical therapist for every 1500 inhabitants. In this case, given that a single professional may work at more than one establishment, the ratio is established based on one physiotherapy workplace for every 1500 inhabitants. In Goiás state and Brazil, a portion of the population depends exclusively on the SUS for access to health services. Thus, the SUS should offer physiotherapy services that guarantee that the number of available workplace is in line with the coverage suggested by the WHO.<sup>7,8</sup>

The present study aimed to map the distribution of physiotherapists and services that integrate the public health network of SUS in Goiás, supplying data to help analyze health services, as well as policies and measures that promote equitable care.

## Methods

This is an analytical documental study based on CNES data, the information system on SUS health facilities. The study was approved by the Research Ethics Committee of the Federal University of Goiás (protocol no. 3.432.016) and followed Brazilian ethical guidelines.

The following secondary data were obtained from the 246 municipalities in Goiás on the CNES homepage,<sup>10</sup> for July 2019:

- Public and private facilities that provide physiotherapy services to the SUS, with information on the type of service provided; number of physiotherapists; administrative setting (public or private); macroregion and municipality.
- Information on physiotherapists that provide services to the SUS, namely, professional specialty; CNES number; municipality; place of employment; workload; employment relationship (self-employed, outsourced or

employment contract); type of contract (natural person, employed by a Consolidation of Labor Laws contract, and fixed-term contract).

Information was extracted manually for each professional and cataloged on an Excel spreadsheet (2016). The number of people with private health insurance in Goiás, in July 2019, was obtained on the National Health Agency<sup>11</sup> (ANS in Portuguese) website in CSV format, which was analyzed using the dynamic table function in Excel. The number of physiotherapists registered with the professional board, according to municipality of residence, was obtained from the homepage of the Regional Board of Physiotherapy and Occupational Therapy of the 11th Region.<sup>12</sup>

Several variables were calculated using the dynamic table function in Excel, in order to meet the study objective. The following variables were studied:

- Number of people covered by municipal physiotherapy (NPCAF), which is the number of citizens in a municipality, region or macroregion dependent on the SUS, covered or treated by a SUS physiotherapy workplace. The smaller this coefficient, the better the population coverage, since there will be fewer people for each workplace, ensuring better access to care.

- Proportion of the population dependent on the SUS, considered those who do not have health insurance and calculated with the following formula: population dependent on the SUS = (total population of the municipality in 2019) - (population that had health insurance in July 2019).

- Per capita gross domestic product (GDP) of 2017, the most recent available on the Brazilian Institute of Geography and Statistics (IBGE) homepage, and the Human Development Index (HDI), which are variables that express the socioeconomic development of a region. These data were obtained on the IBGE homepage.<sup>13</sup>

Distribution maps of physiotherapy coverage in the 246 municipalities in July 2019 were created using the online app available on the Goiás Health Map.<sup>14</sup> Each map contains graduated colors: green (NPCAF  $\leq$  1,500), yellow (NPCAF between 1,501 and 2,000) and red (NPCAF  $>$  2,000). Yellow and red indicate that the municipality has inadequate coverage, below the parameter suggested by the WHO.

Statistical inference was performed using the SPSS statistical program, version 24. The Kolmogorov-Smirnov (KS) test was used to test the normality of variables. The KS test was significant for the variables, meaning that the

distributions were not normal, namely, the number of people in the general population of each municipality; number of persons in the population dependent on the SUS in each municipality; per capita GDP of each municipality; municipal HDI; percentage of the population dependent on the SUS in each municipality; and NPCAF. Given that the data were not normally distributed, Spearman's correlation test was used to determine if there was a rank correlation between the aforementioned variables. Descriptive analysis was carried out for all the study variables. The mean and standard deviation were used for the quantitative variables. Spearman's Rho was applied to express Spearman's correlation ( $r$ ). The significance level used was  $p \leq 0.05$ .

## Results

In the CNES, in relation to the data on Goiás in July 2019, 2,187 records of physiotherapists providing services at public and private facilities in 3,353 workplaces were found. With respect to healthcare facilities affiliated with the SUS, 1,673 physiotherapists were identified in 2,436 workplaces. A total of 801 workplaces (32.9%) were in basic and 1,635 (67.1%) in specialized care (including outpatient departments and hospitals).

In basic care, 281 (35.08%) physiotherapy workplaces were involved exclusively in noncare-related activities, 515 (64.3%) in only outpatient treatment and five (0.6%) alternated between physiotherapy and noncare-related activities. In specialized care, 354 (21.7%) workplaces provided hospital-based physiotherapy exclusively and 586 (35.8%) strictly outpatient care, 421 (25.7%) hospital-based and outpatient physiotherapy and 274 (16.8%) combined physiotherapy and other noncare activities (management). Weekly workload distribution by workplace and physiotherapist working for the SUS are presented in Table 1, according to type of activity (other activities, outpatient care, hospital care and total care).

Among the 917 private physiotherapy workplaces, all related to specialized care, 67 (7.3%) provided hospital care exclusively, 593 (64.7%) only outpatient care, 21 (2.3%) outpatient and hospital care and 236 (25.7%) combined physiotherapy with other noncare activities (management). Figure 1 demonstrates NPCAF distribution per municipality in Goiás.

In July 2019, only 74 municipalities (30.1%) had adequate NPCAF according to WHO guidelines, which are represented by the color green in Figure 1.

Figure 2 shows NPCAF distribution in the different health regions of Goiás. None of the regions demonstrated adequate coverage. The central region achieved the result closest to the number of inhabitants per physiotherapy workplace recommended by the WHO, obtaining 1,521.02 inhabitants/physiotherapy workplace. The largest municipality of this region is Goiânia, capital of Goiás state. Figure 3 shows the NPCAF distribution by health macroregions of Goiás. None of these macroregions have adequate physiotherapy care.

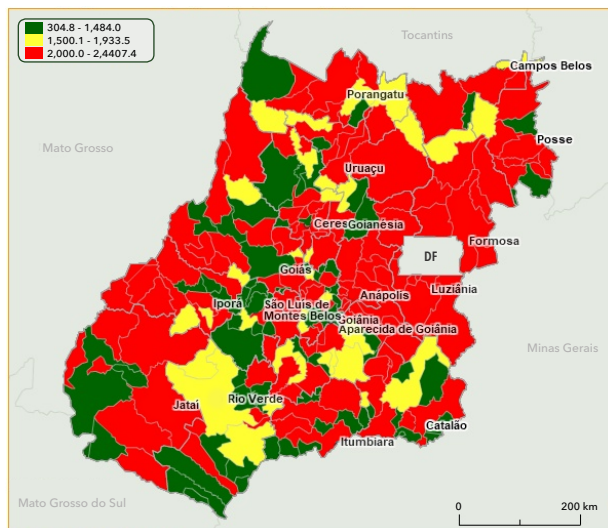
Table 2 presents the statistical analyses of the correlation between the following variables: number

of people in each municipality, number of people dependent on the SUS of each municipality, per capita GDP of each municipality, municipal HDI, percentage of inhabitants dependent on the SUS in each municipality and NPCAF. There was a significant correlation between the total population of the municipality and the other variables: municipal population dependent on the SUS ( $r = 0.99$ ;  $p < 0.001$ ); NPCAF ( $r = 0.46$ ;  $p < 0.001$ ); per capita GDP in 2017 ( $r = 0.13$ ;  $p = 0.03$ ); municipal HDI ( $r = 0.26$ ;  $p < 0.001$ ); percentage of municipal inhabitants dependent on the SUS ( $r = -0.42$ ;  $p < 0.001$ ). All the variables correlated significantly except: municipal populations dependent on the SUS and per capita GDP in 2017 ( $r = 0.08$ ;  $p = 0.17$ ); percentage of municipal inhabitants dependent on the SUS and NPCAF ( $r = 0.05$ ;  $p = 0.38$ ).

**Table 1** - Workload distribution per workplace and physiotherapist working in Health Units belonging to the National Health System (SUS) in Goiás state, July, 2019

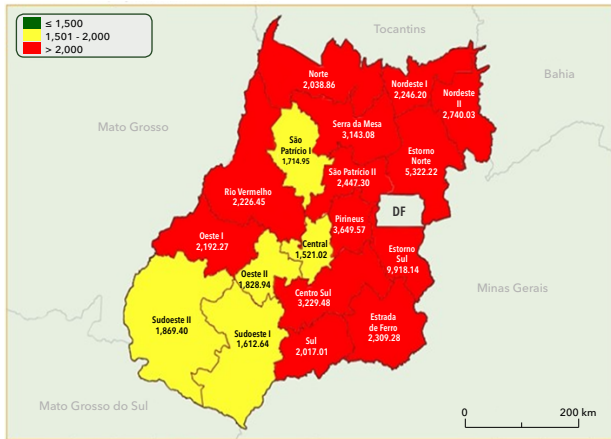
Distribution	Weekly workload									
	Combined care*		Outpatient		Hospital		Others (management)		Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Physiotherapist	28.4	19.3	20.8	17.9	7.7	13.5	10.2	22.7	38.7	22.8
Workplace	19.5	14.1	14.3	13.9	5.3	9.3	7.0	12.1	26.6	10.2

Note: \*Outpatient + hospital; SD = standard deviation.



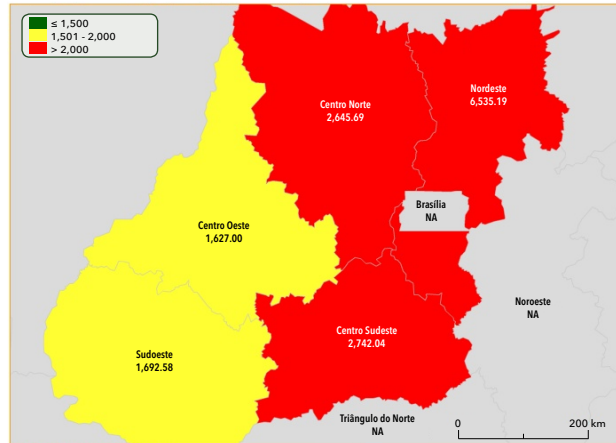
**Figure 1** - Physiotherapy coverage, expressed by the NPCAF, distributed by municipalities in Goiás. July, 2019.

Note: In green color, the municipalities that in July 2019 had adequate NPCAF (number of people covered by municipal physiotherapy) according to the World Health Organization guidelines: Adelândia, Água Limpa, Aloândia, Alto Horizonte, Americano do Brasil, Anhanguera, Araguapaz, Barro Alto, Britânia, Buriti Alegre, Buriti de Goiás, Cachoeira Alta, Cachoeira de Goiás, Cachoeira Dourada, Campo Alegre de Goiás, Ceres, Cezarina, Chapadão do Céu, Córrego do Ouro, Cristianópolis, Crixás, Cumari, Damolândia, Davinópolis, Diorama, Formoso, Goiânia, Goiás, Gouvelândia, Guarani de Goiás, Guarinos, Inaciolândia, Israelândia, Itaguari, Itajá, Itarumã, Jaupaci, Jesúpolis, Joviânia, Lagoa Santa, Mairipotaba, Marzagão, Matrinchã, Mineiros, Moiporá, Morro Agudo de Goiás, Nerópolis, Nova América, Nova Aurora, Ouro Verde de Goiás, Ovidor, Palminópolis, Panamá, Paranaiguara, Paraúna, Perolândia, Pilar de Goiás, Sanclerlândia, Santa Helena de Goiás, Santa Rosa de Goiás, Santo Antônio da Barra, São Francisco de Goiás, São João da Paraúna, São Luís de Montes Belos, São Miguel do Araguaia, São Miguel do Passa Quatro, São Simão, Sítio D'abadia, Teresina de Goiás, Três Ranchos, Trindade, Turvelândia, Urutai e Vila Propício.



**Figure 2** - Physiotherapy coverage distributed by the health regions of Goiás. July, 2019.

Note: Zoom in to a higher resolution.



**Figure 3** - Physiotherapy coverage distributed by the health macroregions of Goiás. July, 2019.

Note: NA = not applicable. Zoom in to a higher resolution.

**Table 2** - Correlation between the municipal variables studied

Variables	Total population		DP SUS		NPCAF		GDP per capita		HDI		% DP SUS	
	r	p-value	r	p-value	r	p-value	r	p-value	r	p-value	r	p-value
Total population	-	-	0.99	<0.001*	0.46	<0.001*	0.13	0.030*	0.26	<0.001*	-0.42	<0.001*
DP SUS	0.99	<0.001*	-	-	0.48	<0.001*	0.08	0.170	0.23	<0.001*	-0.36	<0.001*
NPCAF	0.46	<0.001*	0.48	<0.001*	-	-	-0.20	0.001*	-0.14	0.020*	0.05	0.380
GDP per capita	0.13	0.030*	0.08	0.17	-0.20	0.001*	-	-	0.33	<0.001*	-0.50	<0.001*
HDI	0.26	<0.001*	0.23	<0.001*	-0.14	0.020*	0.33	<0.001*	-	-	-0.53	<0.001*

Note: DP SUS = population dependent on the SUS (National Health System); NPCAF = number of people covered by municipal physiotherapy; GDP = Gross Domestic Product, 2017; HDI = Human Development Index; r = Spearman's correlation. \*Statistically significant correlation.

## Discussion

Historically in Brazil, a considerable number of health professionals work at more than one establishment. For physiotherapy, the legal minimum weekly workload is 30 hours, but in practice it varies from 20 to 44 hours.

Mariotti et al.<sup>15</sup> studied the professional characteristics, training and geographic distribution of physiotherapists in Paraná state and found that 35.5% of physiotherapists worked more than eight hours a day; 23.1%, eight hours; 24.9%, six hours; and only 13.8% less than six hours. With respect to the number of workplaces occupied, 53.3% worked at one establishment; 32.6%, two, 8.2%, three; 2.1% more than three; and 3.7% were unemployed.<sup>15</sup>

The present study found that many professionals work in several municipalities. Thus, when calculating the NPCAF of each municipality in Goiás, it would be necessary to count the individual (professional) as two people, which would be absurd, since the ratio of workplaces per inhabitant is used. In addition, several physiotherapists do not live in the municipality where they work, according to household information contained on the homepage of the Regional Board of Physiotherapy and Occupational Therapy of the 11th Region-DF/GO.<sup>12</sup>

The Federal Board of Physiotherapy and Occupational Therapy (COFFITO) stipulates that physiotherapists are subject to a maximum weekly workload of 30 hours,



according to Law no 8.856/94.<sup>16</sup> However, this law applies to each individual contract, allowing these professionals to work at more than one establishment provided their weekly workload does not exceed 30 hours.<sup>16</sup>

In regard to the NPCAF, in order to guarantee adequate physiotherapy coverage, the WHO suggests an ideal maximum of 1500 inhabitants/physiotherapy workplace.<sup>5,9</sup> In this case, a physiotherapist is expected to work at one establishment with the standard weekly workload of the country, which is 30 hours in Brazil.

With respect to multiple jobs, Silva<sup>17</sup> notes that physiotherapists have close physical contact with their patients, which may cause a significant work overload. In addition to providing care, some opt for teaching positions in order to share their knowledge and train new professionals. Moreover, physiotherapists deal directly with emotions related to suffering, pain, irritability, anxiety, misunderstanding, and death, among many other factors that make their work subject to stress that may significantly compromise their professional life.<sup>17</sup> It is important to note that work overload may compromise their health.

Given that the health system itself is concerned about primary care and meeting the relevant legal priorities, public policies should value physiotherapists by providing better salaries and work opportunities in order to favor health prevention and promotion.

In this respect, Batista<sup>18</sup> conducted a study with 104 physiotherapists from the city of Goiânia, aimed at identifying quality of life at work and burnout levels, and found a 38.10% and 18.10% prevalence of moderate and high emotional exhaustion. In the same study, 49.1% of physiotherapists reported working double or triple the standard number of hours in order to raise their income.

Metzer et al.<sup>19</sup> investigated aspects related to the occupational stress of physiotherapists at a philanthropic hospital in Belo Horizonte, Minas Gerais state, observing that 76.3% displayed this disorder, 60.5% with mild/moderate and 15.8% intense stress.

It is important to note that the professional board (COFFITO) establishes a maximum workload, but professionals need to supplement it to meet their needs. As such, public and trade union policies that value physiotherapists are needed, in order to change this stressful situation that compromises their quality of life.

Tavares et al.<sup>20</sup> described the distribution of physiotherapists in Brazil by analyzing CNES in 2010 and found that 22,238 establishments employed

physiotherapists in Brazil, distributed into 76% of the country's municipalities. In Goiás, only Aporé, Gameleira de Goiás and Rialma (1.22% of Goiás municipalities), did not employ physiotherapists, that is, 98.78% of its municipalities provided coverage, a significant positive value when compared to national data.<sup>20</sup>

In regard to physiotherapy workplaces in Goiás, 32.9% worked in basic and 67.1% in secondary and tertiary (specialized) care, while in a national analysis carried out by Tavares et al.<sup>20</sup> only 13% worked in Primary Health Care and 87% in secondary and tertiary care. Mariotti et al.<sup>15</sup> found that most professionals work in more than one healthcare level (69.8%), 71.6% in secondary, 69% in tertiary and 49.7% in primary care, in addition to 18% who are teachers.

Although most professionals work in secondary and tertiary care in Goiás, Mariotti et al.<sup>15</sup> demonstrated better distribution of physiotherapists in the different care levels, with a certain esteem for the primary level, likely due to the history of the profession. However, a significant number work in primary care, which is developing and being stimulated by more recent public policies.<sup>15</sup>

Despite the importance of physiotherapy in primary health care, with the development of quality of life and health education programs, proposals for changing life habits and assessments of musculoskeletal and ergonomic functions,<sup>15</sup> and despite the proposed creation of the National Policy for Functional Health presented at the 13th National Health Council, which remains active in the national policy agenda, there is no law that mandates the inclusion of physiotherapy in the Family Health Strategy (ESF in Portuguese) or the Center for Family Health Support (NASF), significantly hindering better physiotherapist distribution in primary care.<sup>8,21</sup>

With respect to the distribution of specialized care, 21.7% of the physiotherapy workplaces were exclusively hospital-based, 35.8% provided outpatient care, 25.7% both hospital and outpatient physiotherapy and 16.8% combined physiotherapy and other noncare activities (management). This resembles the national study conducted by Tavares et al.,<sup>20</sup> who found that outpatient care accounts for 57%, followed by hospital-based with 29%.

In relation to municipal physiotherapy coverage, 30.1% of Goiás municipalities exhibited adequate coverage. In this respect, the present study partially corroborates Matsumura et al.,<sup>9</sup> where studies on the distribution of physiotherapists and their percentages

by municipality in the national health system report an inequitable arrangement. This undermines the importance of the profession in improving public health quality and its inclusion in the SUS.

Medeiros and Calvo<sup>22</sup> performed a study similar to the present investigation and found 6471 physiotherapists enrolled in Crefito-10, which establishes an approximate ratio of 1000 inhabitants for each physiotherapist in Santa Catarina state, where 1.4 million have health insurance and 4.8 million are treated by the SUS. The study showed that in February 2013, 1,349 SUS physiotherapists were enrolled in the CNES, establishing a ratio of 3,500 users for each physiotherapist.<sup>22</sup> Physiotherapy is essentially private, given that the small number of professionals treating SUS users does not explain the lack of professionals in the market, but rather is due to the gap in physiotherapy services in the public health system.

According to Matsumura et al.,<sup>9</sup> there is a high concentration of physiotherapists only in the large urban centers, which differs from the study of Medeiros and Calvo,<sup>22</sup> who found the worst coverage ratios in the most populated regions of Santa Catarina. In Goiás, of the 74 municipalities with the adequate ratios recommended by the WHO, only two of the fourteen with more than 100,000 inhabitants were adequate (Goiânia and Trindade), while 40 of the 74 adequate municipalities had fewer than 5,000 inhabitants.<sup>9,20</sup>

In this study, it can be inferred that the larger the population of the municipality (and the higher the absolute frequency of people dependent on the SUS), the greater the NPCAF, that is, the lower the physiotherapy coverage provided by the SUS. This indicates that the most densely populated Goiás municipalities had difficulty achieving the parameter suggested by the WHO in terms of providing an adequate number of physiotherapists to the population.

On the other hand, there is a statistically significant inverse correlation between the percentage of inhabitants dependent on the SUS and the population of the municipality (or the municipal population dependent on the SUS), which suggests that the most densely populated municipalities have a larger proportion (percentage) of people dependent on the SUS, with a higher ratio of people with supplemental health coverage (health insurance). This fact may result in lower physiotherapy care (higher NPCAF) due to a cultural fallacy, namely that government authorities believe that the entire population is covered, since there is a large

supply of private physiotherapy services. However, this does not guarantee access for the underserved population, who are totally dependent on the and do not have the financial resources for physiotherapy treatment, which is generally costly due to the numerous sessions required.

It is important to note that the higher the HDI of Goiás municipalities, the lower the NPCAF, that is, the higher the HDI, the greater the coverage, suggesting that more developed Goiás municipalities provide physiotherapy to their citizens. Greater economic, social and educational development is a relevant variable for the quality of the public health services provided.

The higher the per capita municipal GDP, the lower the NPCAF, and, as such, the greater the coverage, indicating that the wealthiest Goiás municipalities (with the highest per capita GDP) provide better physiotherapy coverage. Adequate funding is an important variable to guarantee higher coverage, a factor that reflects the quality of public health services.

It is important to underscore that there is no statistically significant correlation between the NPCAF and percentage of municipal inhabitants dependent on the SUS. This means that municipalities with a small percentage of the population dependent on the SUS (and higher proportion with supplemental coverage) does not guarantee greater coverage than that provided by municipalities with a higher percentage of people dependent on the SUS. Physiotherapy coverage in the SUS, therefore, is a variable that depends more on the economic, social and cultural development of a municipality than population size or private coverage (it is expected that this coverage be expressed by the size of the population with supplemental coverage: the larger this population, the greater the number of private services available).

Moreover, there is a correlation between municipal population size and its per capital GDP or HDI, that is, more densely populated municipalities tend to be wealthier and more developed, but also provide worse SUS physiotherapy coverage. If many private services are available in the most populated municipalities, which are also the wealthiest, it would not be difficult to hire these services for the SUS as supplemental treatment, given that the municipal tax revenue is higher. However, adequate SUS coverage is not a priority for the municipal governments of large urban centers, such as the capital of Goiás.

Physiotherapists are some of the most important professionals in health services and should be available to the entire population. However, much needs to be done in Goiás and Brazil as a whole, and this same situation can be observed in different regions of the world. The 16th Costa Rican Report on Sustainable Human Development,<sup>23</sup> which surveys the needs of a group with impairments and their families, covering different types of disorders and different areas of the country, reported inadequate physiotherapy coverage in 40% of the cases. The concern about providing access to these professionals and their importance has been a reality in the USA since 1973, as demonstrated by Gentry and Mathews,<sup>24</sup> who studied the situation of health departments and hospitals in that country, demonstrating the need for physiotherapists in these settings.

Zogg et al.<sup>25</sup> showed that if the individuals assessed in their study expanded their health insurance coverage, the associated rehabilitation gains have the potential to improve the quality of life and the functional outcomes of more than 60,000 adult trauma patients annually in the USA, directly affecting the health of some of the most vulnerable populations in the country.

In a prospective cohort study conducted in Ontario, Canada, Landry et al.<sup>26</sup> assessed the consequences of excluding physiotherapy from public health funding due to the implementation of public policies. The authors found that patients who continued receiving physiotherapy were ten times more likely to report very good or excellent health status when compared to those who did not receive these services.<sup>26</sup> McNaughton et al.<sup>27</sup> demonstrated the same concern about physiotherapy provision in New Zealand, concluding that to maximize the results for stroke patients, improvements are needed in clinics aimed at rehabilitation, rehabilitation intensity and access to immediate rehabilitation in the community.

This study is highly relevant because research' physiotherapy in the public health context, particularly in Goiás and its health regions and macroregions, is scarce. The results, however, should be interpreted with caution since they involve the secondary records available in the CNES database, whose access is public, but restricted in terms of other information such as sociodemographic profile, professional training data, salaries and personal documents. Since this research encompasses only a specific time period (July 2019) and only Goiás, additional studies are needed in all Brazilian states to provide greater knowledge regarding physiotherapy in the SUS.

## Conclusion

According to the CNES, in Goiás in July 2019, 1,673 physiotherapists were enrolled in public/private facilities that provide services to the SUS, distributed in 2,436 workplaces. Of these, 801 (32.9%) involved basic and 1,635 (67.1%) specialized health care (including outpatient facilities and hospitals).

Although 98.7% of Goiás municipalities have physiotherapy coverage, there is no uniform distribution of workplaces, where coverage for the SUS is inadequate in 69.9% of the municipalities and in all the health regions and macroregions of the state. The present study found an NPCAF of 2,381 inhabitants dependent on the SUS for each physiotherapy workplace, when the entire population of Goiás is analyzed, indicating low physiotherapy coverage in the SUS.

The NPCAF showed an inverse correlation with per capita GDP and municipal HDI and a direct correlation with population size, that is, a direct correlation between greater physiotherapy coverage and higher HDI and per capita GDP, and a correlation between larger population size and lower coverage. The most densely populated municipalities, even those that are wealthy and more developed, have higher NPCAF, but worse coverage. Less populated municipalities that are poor and underdeveloped have worse physiotherapy coverage than those that are wealthier and more developed.

## Authors' contributions

KRS was responsible for the conception, writing and study design. AMB and PSB, for revising the work, methodological design and advice. All the authors analyzed and interpreted the data and approved the final version.

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