ORIGINAL ARTICLE

OVERWEIGHT AND OBESITY IN THE STATE OF GOIÁS, BRAZIL: ASPECTS RELATED TO PRIMARY HEALTH CARE

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Highlights: (1) Insufficient infrastructure limits care for overweight and obesity in PHC. (2) Small municipalities in Goiás have better infrastructure and implementation of healthcare initiatives. (3) Use of Food and Nutrition Surveillance tools in the state remains low. (4) Structural inequalities compromise equity and the implementation of the PNAN in Goiás.

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OVERWEIGHT AND OBESITY IN THE STATE OF GOIÁS, BRAZIL: ASPECTS RELATED TO PRIMARY HEALTH CARE

ABSTRACT

Objective: To evaluate the infrastructure and organization of care provided to individuals with overweight and obesity (O/O) in Primary Health Care (PHC) in small, medium, and large municipalities in the state of Goiás. **Methods:** A cross-sectional study was conducted with professionals from 330 health units in Goiás, using an electronic questionnaire. A descriptive analysis was performed, and differences between municipalities were analyzed using the chi-square and Fisher's exact tests, with Bonferroni correction for multiple comparisons. **Results:** Less than 41% of health units have basic infrastructure items, and only 52.4% conduct territorial mapping. The most common organizational strategies were referral protocols and risk stratification; however, less than 35% of professionals use Food and Nutrition Surveillance tools, indicating low integration of these practices into the work process. Small municipalities presented better structural conditions and greater community integration; medium-sized municipalities showed weaknesses in mapping and care organization; and large municipalities exhibited the most deficiencies, especially in infrastructure, problem-solving capacity, and data recording. **Conclusion:** PHC in Goiás presents significant limitations in infrastructure and care organization for the management of overweight and obesity, with poorer performance in large municipalities.

Keywords: Public Health; Overweight; Obesity; Primary Health Care.

INTRODUCTION

Obesity is a global public health problem and is considered one of the greatest challenges for health systems, both due to its consequences and the high cost to public coffers and losses to economic productivity. More than four billion people worldwide may be affected by 2035, representing a 50.0% increase[1]. An analysis of 27 Brazilian cities in 2023 found that the prevalence of overweight was 61.4%, with a higher rate among men (63.4%) than women (59.6%). The prevalence of obesity among adults was 24.3%. In Goiânia, Goiás, 55.0% and 17.7% of adults were overweight and obese, respectively[2].

This challenging scenario underscores the importance of implementing public policies with strategic health care initiatives to prevent and treat obesity[3,4]. In Brazil, health care is centralized within the Public Unified Health System (SUS – Sistema Único de Saúde), with Primary Health Care (PHC) serving as the first level of care and the main point of entry. In Brazil, PHC is provided at different types of health units, including the Basic Health Units (UBS – Unidades Básicas de Saúde) and Family Health Units (USF – Unidades de Saúde da Família), the latter being part of the Family Health Strategy (ESF – Estratégia Saúde da Família), which is the priority model for the expansion and consolidation of PHC in the country[5,6].

To expand coverage and access to services, as well as improve health care, the Brazilian Ministry of Health (MS – Ministério da Saúde) has developed guidlines[7-12] and implemented programs and public policies for the prevention and treatment of overweight and obesity (O/O) and Chronic Noncommunicable Diseases (CNCDs)[13-16]. Of particular importance is the National Food and Nutrition Policy (PNAN – Nacional de Alimentação e Nutrição), which aims to promote adequate and healthy dietary practices, conduct Food and Nutrition Surveillance (FNS), and provide prevention and comprehensive care for conditions related to food and nutrition[13-14]. However, implementation and integration of these actions pose a major challenge for PHC managers and health teams[17,18]. Consequently, the MS seeks to establish the Overweight and Obesity Care Pathways (LCSO – Linhas de Cuidado do Sobrepeso e Obesidade) at the regional level, considering the challenges of care and disparities between regions, thereby promoting integrated care[7]. The effective implementation of the LCSO in PHC requires a solid organizational structure, adequate training of healthcare professionals, and a patient-centered, evidence-based approach[9].

To care for individuals with overweight and obesity and implement the LCSO, the Brazilian Ministry of Health recommends that PHC units have adequate physical infrastructure, including examination rooms, availability of services with spacious rooms, rooms for group activities, and access ramps[5]. They must have reinforced furniture, including chairs, an appropriate examination table, and a stretcher with high weight capacity. Essential equipment includes a scale with a capacity exceeding 200 kg, a stadiometer, an anthropometric tape

measure, a sphygmomanometer suitable for obese individuals, a stethoscope, and other instruments necessary for clinical examination[9].

Although national studies have addressed aspects of obesity care in PHC, analyses that integrate infrastructure and structural differences among municipalities of varying sizes remain less frequent[18-22]. This integrated and comparative approach helps fill important gaps in the Brazilian literature, especially in the Central-western region, where there is still a scarcity of comprehensive evaluations on the management of O/O in PHC.

This need for further investigation becomes even more evident in light of the challenges related to monitoring, infrastructure, and care management. The problem was exacerbated by the COVID-19 pandemic, which reduced essential interventions and required the reorganization of services. In this context, evaluating the management of O/O in PHC is essential to identify gaps, understand associated determinants, and guide public health policies[23,24]. Therefore, this article aims to evaluate the infrastructure and organization of care provided to people with O/O in PHC in small, medium, and large municipalities in the state of Goiás.

METHODS

Study Design

This cross-sectional study was initiated by the General Coordination of Food and Nutrition (CGAN/MS) of the Brazilian MS, through a public call for proposals issued by the National Council for Scientific and Technological Development (CNPq). The CGAN/MS and representatives from Higher Education Institutions coordinated the state-level projects and defined the study design, the sample, and the data collection instrument employed.

Sampling and study location

The sample size was determined using a simple random sampling plan, considering a finite population (number of health units = 1,465), a 5.0% margin of error, and a 95.0%

confidence level [25]. A sample of 305 health units was obtained in the state of Goiás. To account for potential losses and refusals, 671 health units were selected, distributed proportionally according to the number of health units in the state capital as well as in large, medium, and small municipalities across the state. The studied sample consisted of 330 units, which were classified either as a UBS or USF. The collected percentage proportions resemble the percentage of the planned sample according to the size of the municipalities (Supplementary Table).

Initially, the MS provided a list of health facility managers in each municipality. The research team contacted the managers, requesting that they nominate a professional from their respective facilities to participate in the study. Those nominated were invited via email and telephone, and upon acceptance, received a link to access the survey questionnaire. The target audience consisted of healthcare professionals with a college degree working in PHC, either in UBSs, ESFs, or Family Health Support Centers (NASF – Núcleos de Apoio à Saúde da Família), who were preferably leading food and nutrition initiatives. Professionals who did not work at the health units selected for the study were excluded.

Data Collection

Data collection took place between November 2020 and August 2021 and was conducted using the questionnaire "Organization, management, and nutritional care provided to overweight/obese individuals in Primary Health Care," discussed in a previous publication[19.] This electronic, semi-structured, self-administered instrument used the *SurveyMonkey* online questionnaire tool. It consisted of 88 multiple-choice questions and 11 open-ended questions, organized into 10 sections, and had an average response time of 50 minutes.

The links sent to healthcare professionals were categorized according to the population size of their respective municipalities of practice: large (capital cities and municipalities with more than 150,000 inhabitants); medium (municipalities with between 30,000 and 150,000 inhabitants); and small (municipalities with fewer than 30,000 inhabitants), with one respondent per healthcare facility.

Variables of interest

The variables selected from the questionnaire were 1- respondent identification (gender, age group, skin color or ethnicity, profession, years of experience, and employment status); 2- health facility identification (region and facility location); 3- implementation of the LCSO (infrastructure, furniture, and equipment); 4- territorial mapping (territorial map, activities for map construction, priority conditions in mapping, public spaces, and equipment available in the territory); and 5- monitoring, evaluation, and coordination related to healthcare for people with O/O (care services, strategies for organizing care and treatment, analysis of user data, FNS actions in care, use of FNS tools, and use of SISVAN information).

Statistical Analysis

The database was created in Microsoft Excel, version 2010. STATA software, version 12.0, was used for data analysis. Descriptive analysis of the data was performed by calculating absolute and relative frequencies. Pearson's chi-square test was used to assess differences between categorical variables in relation to municipality size ($p<0.05$). Fisher's exact test was adopted as an alternative when more than 20% of the table cells had an expected frequency of less than five to ensure greater precision under these conditions. Considering that the multiple application of the same hypothesis test increases the probability of finding significant differences by chance (Type I error), the Bonferroni correction was implemented. This conservative method controls the error rate by dividing the alpha significance level ($\alpha=0.05$) by the number of comparisons performed, establishing a new significance threshold of $p < 0.016$. This approach ensures greater rigor in the interpretation of results, guaranteeing that comparisons considered statistically significant are, in fact, robust.

Ethical considerations

The study was approved by the Research Ethics Committee of the Federal University of Goiás (CAAE No. 26543219.5.0000.5083). All participants signed the Informed Consent

Form and were duly informed about the research topic, the privacy and confidentiality guarantee, and their right to refuse to participate in the study at any time.

RESULTS

Professionals from 330 health facilities in 109 municipalities in the state of Goiás participated in the study. Among the participating professionals, the majority were female (92.7%), ≤ 40 years of age (65.8%), and of mixed race (51.5%). Nursing was the most represented professional category (79.0%). Approximately 50.0% worked in the central urban region. About 47.0% were assigned to UBSs; approximately 38.0% were in large municipalities; 71.2% had been in their current position for at least two years; 51.5% had temporary or indefinite-term health service contracts; and 37.0% were civil servants (Table 1).

Table 1. Characterization of the sociodemographic profile of participating primary health care professionals (Goiás, Brazil, 2020–2021).

Profile of healthcare professionals	(n)	(%)
Gender		
Female	306	92.7
Male	24	7.2
Age group[1]		
≤ 40 years	206	65.8
> 40 years	107	34.2
Skin color or ethnicity		
White	127	38.5
Black	19	5.8
Brown	170	51.5
Asian	11	3.3
Occupation		
Nursing	261	79.0
Nutrition	46	13.9
Dentistry	9	2.7
Other health-related higher education programs[2]	14	4.2
Region of practice		
Central Urban	163	49.4
Suburban Periphery	134	40.6
Rural	33	10.0
Service unit		
Basic Health Unit (UBS)	155	46.9
Family Health Unit (USF)	140	42.4
NASF—Types I, II, or III	32	9.6
Size of municipality served		
Small	92	27.9
Medium	111	33.6
Large	124	37.6
Duration of employment		
< 2 years	95	28.8
≥ 2 to 10 years	160	48.5
>10 years	75	22.7
Employment status		
Civil servant	122	37.0
Temporary or permanent contract[3]	170	51.5
Other[3]	38	11.5

[1]17 (5.5%) errors due to incorrect information.
[2]Medicine, Psychology, Physical Therapy, Physical Education, and Pharmacy.
[3]Temporary or permanent contract with a Social Organization or as a self-employed professional.

Source: Prepared by the authors

Regarding the infrastructure of health facilities, only accessibility and adequate restrooms had a prevalence exceeding 50.0%, with higher rates in small municipalities (81.1% and 74.8%, respectively). The availability of adequate space for educational activities and physical exercises was higher in small municipalities (68.5% and 40.2%, respectively). Among

essential furniture and equipment, the blood pressure monitor with a special cuff was the only item found in more than half of the health facilities (63.6%). Fewer than 41.0% of the facilities had basic furniture items (230-kg scale, examination table, adequate chairs and stools, and transfer stretchers), with lower availability in large municipalities (Table 2).

Table 2. Infrastructure, furniture, and equipment necessary for the care of overweight/obese individuals are available in primary care health facilities according to municipality size (Goiás, Brazil, 2020–2021).

Variable	Total n (%)	Municipality size			P-value
		Large (n = 92)	Medium (n = 111)	Small (n = 127)	
Infrastructure					
Accessibility[1]	208 (63.0)	44 (47.8)[a]	61 (54.9)[a]	103 (81.1) [b]	<0.001
Adequate bathrooms[2]	185 (56.0)	38 (41.3)[a]	52 (46.8)[a]	95 (74.8)[b]	<0.001
Adequate space for group activities	159 (48.2)	25 (27.2)[a]	47 (42.3)[a]	87 (68.5)[b]	<0.001
Adequate space for physical activity	98 (29.7)	16 (17.4)[a]	31 (27.9)[a,b]	51 (40.2)[b]	0.008
Furniture and equipment					
Blood pressure monitors with special cuffs	210 (63.6)	54 (58.7)	73 (65.7)	83 (65.3)	0.162
230 kg scale	114 (34.5)	21 (22.8)[a]	34 (30.6)[a,b]	59 (46.4)[b]	0.002
Examination table	108 (32.7)	23 (25.0)	32 (28.8)	53 (41.7)	0.070
Appropriate chairs/benches	106 (32.1)	19 (20.6)[a]	32 (28.8)[a,b]	55 (43.3)[b]	0.008
Wheelchair	134 (40.6)	30 (32.6)[a]	40 (36.0)[a,b]	64 (50.3)[b]	0.028
Transfer stretcher	42 (12.7)	3 (3.3)[a]	9 (8.1)[a]	30 (23.6)[b]	<0.001
Vehicle for transporting people with O/O	36 (10.9)	2 (2.2)[a]	11 (9.9)[b]	23 (18.1)[b]	<0.001

[1]Accessibility: width of doors and hallways, as well as ramps that allow unimpeded movement of users.
[2]Adequate restrooms: width and access ramps. Different superscripted lowercase letters indicate significant differences between groups as determined by the chi-square test with Bonferroni correction for multiple comparisons. The values in the table reflect the number and percentage of individuals who reported adequate conditions or the presence of the items studied.

Source: Prepared by the authors

The territorial mapping found that 52.4% of professionals reported conducting nutritional care. In this process, the identification of community structures and the survey of social programs were the main aspects identified, in approximately 48.0%, and activities for map construction were more prevalent in small municipalities compared to medium-sized ones ($p<0.035$). Regarding the conditions identified as priorities in territorial mapping, 34.2% to 49.0% of professionals identified families with CNCDs, in situations of social vulnerability, with O/O and malnutrition as the highest-priority groups, with the identification of O/O and malnutrition being higher in small municipalities (Table 3). Daycare centers and public schools were the most frequently mentioned public spaces and facilities in the territorial survey, with

no statistical difference between municipality sizes. The presence of open-air markets, produce markets, health clinics, and community centers was also mentioned, particularly in small municipalities (Table 3).

Table 3. Territorial mapping for the care of overweight/obese individuals in primary care health units, according to municipality size (Goiás, Brazil, 2020–2021).

Variable, n (%)	Total	Municipality size			P-value
		Large (n = 92)	Medium (n = 111)	Small (n = 127)	
Territorial Map					
Mapping of the territory and/or health	173 (52.4)	51 (55.4)[ab]	45 (40.5)[a]	77 (60.6)[b]	0.007
Activities for constructing the map					
Identification of community structures	156 (47.2)	45 (48.9)[ab]	39 (35.1)[a]	72 (56.6)[b]	0.028
Mapping of FNIS in risk areas	98 (29.7)	24 (26.0)[ab]	23 (20.7)[a]	51 (40.1)[b]	0.003
Survey of social programs (PBF and others)	158 (47.8)	43 (46.7)[ab]	40 (36.0)[a]	75 (59.0)[b]	0.006
Device Mapping of FNS	111 (33.6)	29 (31.5)[ab]	28 (25.2)[a]	54 (42.5)[b]	0.035
Mapping of the food system, customs, and traditions	85 (25.7)	25 (27.2)[ab]	18 (16.2)[a]	42 (33.0)[b]	0.021
Priority conditions in mapping					
Households/residences with social vulnerability	150 (45.4)	42 (45.6)	41 (36.9)	67 (52.7)	0.072
Households with CNCDs	162 (49.0)	48 (52.1)	43 (38.7)	71 (55.9)	0.093
Households with people with O/O	142 (43.0)	38 (41.3)[ab]	39 (35.1)[a]	65 (51.1)[b]	0.037
Households with malnourished individuals	113 (34.2)	30 (32.6)[a]	31 (27.9)[b]	52 (40.9)[c]	0.009
Public spaces or facilities in the territory					
Food production from family farming	70 (21.2)	10 (10.9)[a]	16 (14.4)[a]	44 (34.6)[b]	<0.001
Community kitchens	13 (3.9)	6 (6.5)[a]	0[b]	7 (5.5)[c]	<0.001
Popular restaurants	23 (7.0)	12 (13.0)[a]	8 (7.2)[a]	3 (2.4)[b]	<0.001
Food bank	9 (2.7)	2 (2.2)[a]	2 (1.8)[a]	5 (3.9)[b]	<0.001
Community gardens	43 (13.0)	6 (6.5)[a]	12 (10.8)[a]	25 (20.0)[b]	<0.001
Open-air markets, produce markets	128 (38.8)	39 (42.4)[ab]	34 (30.6)[a]	55 (43.3)[b]	0.023
Health Academy	109 (33.0)	27 (29.3)[ab]	26 (23.4)[a]	56 (44.1)[b]	0.002
Community centers	91 (27.6)	17 (18.5)[a]	23 (20.7)[a]	51 (40.2)[b]	<0.001
Public Daycare Centers	138 (41.8)	38 (41.3)	38 (34.2)	62 (48.8)	0.082
Public Schools	168 (50.9)	49 (53.3)	44 (39.6)	75 (59.0)	0.090

FNIS: Food and Nutritional Insecurity. PBF: Bolsa Família Program. FNS: Food and Nutritional Security. CNCD: Chronic Noncommunicable Disease. O/O: Overweight and obesity. The values in the table reflect the number and percentage of individuals who reported adequate conditions or the presence of the items studied.

Source: Prepared by the authors.

The main services available to care for users with overweight and obesity were health units (UBSs/USFs) and basic pharmacies (>70.0%), followed by NASFs, urgent and emergency care services, home care programs, hospitals under various management models, and health academies (>50.0%) (Table 4). The availability of care for individuals with O/O at UBSs/USFs, NASFs, health academies, the home care program, and basic pharmacies was higher in small municipalities than in large municipalities ($p<0.02$) (Table 4).

Healthcare professionals reported, with a frequency exceeding 60.0%, the following strategies for organizing care: risk stratification by severity of O/O, referral and counter-referral

flow, a coordination center, clinical protocols and therapeutic guidelines in PHC, and protocols for referral from PHC to specialized care. However, less than 50.0% of professionals reported performing case management and managing waiting lists for appointments and/or surgeries. The following treatment strategies stood out: nutritional care (88.1%), psychological care (80.3%), family-centered approach (77.2%), early diagnosis (75.4%), and promotion of physical activity (71.8%). Pharmacological and surgical treatments were predominantly in large municipalities (63.0% and 47.8%, respectively) (Table 4).

Table 4. Care provided to overweight/obese individuals in primary care health facilities, according to municipality size (Goiás, Brazil, 2020–2021).

Variable, n (%)	Total	Municipality size			P-value
		Large (n = 92)	Medium (n = 111)	Small (n = 127)	
Health care services					
Basic Health Units/Family Health Units	306 (92.7)	80 (86.9)[a]	101 (90.9)[ab]	125 (98.4)[b]	0.007
Expanded Family Health Center (NASF)	219 (66.4)	47 (51.0)[a]	81 (73.0)[b]	91 (71.6)[b]	0.015
Health Academy	173 (52.4)	32 (34.8)[a]	63 (56.8)[b]	78 (61.4)[b]	<0.000
Basic Pharmacy	235 (71.2)	60 (65.2)[a]	74 (66.7)[ab]	101 (79.5)[b]	0.011
Hospital of any management type	196 (59.4)	46 (50.0)[a]	67 (60.4)[b]	83 (65.3)[b]	0.012
Specialized care and polyclinics	117 (35.4)	46 (50.0)[a]	48 (43.2)[b]	23 (18.1)[c]	0.000
Home Care Program	198 (60.0)	45 (48.9)[a]	66 (59.5)[b]	87 (68.5)[b]	0.003
Urgent and Emergency Services	211 (63.9)	55 (59.8)	74 (66.7)	82 (64.6)	0.555
Medical Specialties Center	101 (30.6)	30 (32.6)[a]	50 (45.0)[b]	21 (16.5)[c]	<0.000
Strategies for organizing care					
Risk stratification by severity	231 (70.0)	64 (69.6)[a]	72 (64.8)[b]	95 (74.8)[b]	0.006
Reference and counter-reference flow	200 (60.6)	64 (69.6)[a]	75 (67.5)[a]	61 (48.0)[b]	0.003
Case management (for complex cases)	159 (48.1)	39 (42.4)	52 (46.8)	68 (53.5)	0.300
Waiting list management (appointments and/or surgeries)	124 (37.5)	43 (46.7)[a]	33 (29.7)[a]	48 (37.8)[a]	0.019
Overweight and obesity care pathway	78 (23.6)	19 (20.6)	19 (17.1)	40 (31.5)	0.075
Individualized treatment plan	104 (31.5)	27 (29.3)	33 (29.7)	44 (34.6)	0.917
Regulation center	206 (62.4)	64 (69.6)[a]	75 (67.5)[a]	67 (52.7)[a]	0.039
Clinical protocols and treatment guidelines in PHC[1]	207 (62.7)	57 (61.9)	69 (62.1)	81 (63.7)	0.619
Clinical protocols and treatment guidelines SC[2]	126 (38.1)	33 (35.9)	49 (44.1)	44 (34.6)	0.083
Primary care referral protocols to specialized care	232 (70.3)	70 (76.0)	77 (69.3)	85 (66.9)	0.506
Treatment strategies					
Family-centered approach	255 (77.2)	62 (67.4)[a]	85 (76.5)[ab]	108 (85.0)[b]	0.039
Nutritional care	291 (88.1)	78 (84.9)	95 (85.5)	118 (92.9)	0.258
Psychological care	265 (80.3)	67 (72.8)[a]	85 (76.5)[ab]	113 (88.9)[b]	0.029
Early diagnosis	249 (75.4)	67 (72.8)	82 (73.8)	100 (78.7)	0.768
Mutual aid groups	104 (31.5)	19 (20.6)[a]	37 (33.3)[a]	48 (37.8)[b]	0.001
Availability of integrative health practices	159 (48.2)	44 (47.8)	47 (42.3)	68 (53.5)	0.136
Promotion of physical activity	237 (71.8)	59 (64.1)	80 (72.0)	98 (77.1)	0.183
Drug treatment	169 (51.2)	58 (63.0)[a]	58 (52.2)[ab]	53 (41.7)[b]	0.004
Surgical treatment	95 (28.9)	44 (47.8)[a]	30 (27.0)[b]	21 (16.5)[c]	<0.000

PHC: Primary Health Care. SC: Specialized Care. The values in the table reflect the number and percentage of individuals who reported adequate conditions or the presence of the items studied.

Source: Prepared by the authors

The main FNS actions adopted to care for individuals with O/O were the collection of weight and height measurements to calculate Body Mass Index (BMI), as well as early nutritional diagnosis based on nutritional monitoring and clinical and laboratory tests, reported by more than 70.0% of professionals, with no difference between municipality sizes. However, food intake assessment was performed by only 55.4% of health units (Table 5).

The use of FNS tools was reported by less than 35.0% of the professionals. Among these tools, the most commonly used were monitoring of anthropometric data (34.2%), assessment of the nutritional status of schoolchildren (29.0%), and updating the Brazilian Food and Nutrition Surveillance System (SISVAN – *Sistema de Vigilância Alimentar e Nutricional*) (28.9%). The use of FNS tools was consistently higher in small municipalities than in large ones ($p<0.02$). Approximately 50.0% of the professionals analyzed user and territorial data, and only 21.5% discussed the territory's FNS indicators. To support decision-making in the context of nutritional care, about 75.0% of professionals mentioned using information from the SISVAN and/or the e-SUS Primary Care System, with these actions being predominant in small municipalities (Table 5).

Table 5. Implementation actions for food and nutrition surveillance in the care of overweight/obese individuals in primary care health units according to municipality size (Goiás, Brazil, 2020–2021).

Variable, n (%)	Total	Municipality size			P-value
		Large (n = 92)	Medium (n = 111)	Small (n = 127)	
FNS actions in health care					
Measure weight and height and calculate BMI[1]	287 (86.9)	85 (92.4)	92 (82.8)	110 (86.6)	0.274
Assess food intake	183 (55.4)	45 (48.9)	61 (54.9)	77 (60.6)	0.416
Assess body composition using a skinfold caliper	156 (47.2)	38 (41.3)	48 (43.2)	70 (55.1)	0.185
Body composition assessed by bioimpedance	58 (17.5)	12 (13.0)	18 (16.2)	28 (22.0)	0.373
Early nutritional assessment	233 (70.6)	60 (65.2)	79 (71.1)	94 (74.0)	0.656
FNS tools					
Monitor of anthropometric data	113 (34.2)	26 (28.3)[a]	39 (35.1)[b]	48 (37.8)[b]	0.008
Assess the nutritional status of schoolchildren	96 (29.0)	20 (21.7)[a]	31 (27.9)[b]	45 (35.4)[b]	0.003
SISVAN update at the UBS	95 (28.9)	18 (19.6)[a]	33 (29.7)[b]	44 (34.6)[b]	0.014
Monitor of dietary intake data	93 (28.1)	19 (20.6)[a]	35 (31.5)[b]	39 (30.7)[b]	0.004
Report on the nutritional status of the facility's users	66 (20.0)	14 (15.2)[a]	27 (24.3)[b]	36 (28.3)[b]	0.004
User data analysis					
Analysis of user and territorial data/diagnosis	163 (49.9)	38 (41.3)[a]	48 (43.2)[a]	77 (60.6)[b]	0.005
Team discusses the territory's FNS indicators	71 (21.5)	14 (15.2)[a]	20 (18.0)[a]	37 (29.1)[b]	0.027
SISVAN information to support decision-making	248 (75.1)	65 (70.6)[a]	77 (69.4)[a]	106 (83.5)[b]	0.028

FNS: Food and Nutrition Surveillance. BMI: Body Mass Index. SISVAN: Brazilian Food and Nutrition Surveillance System. UBS: Basic Health Unit. The values in the table reflect the number and percentage of individuals who reported adequate conditions or the presence of the items studied.

Source: Prepared by the authors

DISCUSSION

The findings showed that, in the state of Goiás, health care for people with O/O has weaknesses, with disparities among municipalities, particularly regarding the proper implementation of PNAN guidelines. There is a lack of adequate infrastructure and equipment in health units, and management and data analysis efforts are insufficient for health care. The deficiency in the use of FNS tools indicates poor alignment of work processes for food and nutrition interventions in health facilities.

Regarding the presence of infrastructure, furniture, and equipment, between 10.9% and 40.6% of health facilities had adequate furniture, and approximately 64.0% were accessible. Significant disparities were identified in the infrastructure of health facilities, and more adequate in small municipalities. A study that evaluated the structure of UBSs in 4,845 municipalities in Brazil elucidated that less than 8.0% of UBSs had adequate infrastructure, and less than 27.0% of UBSs were considered to have adequate access to obesity management[26]. The presence of infrastructure, furniture, and equipment in health units is closely linked to the performance and adequacy of the work process of PHC professionals[26,27]. Therefore, adequate physical structure and the availability of equipment improve access and the effectiveness of managers and their health teams[27].

This reality is similar to that observed in South Asian countries, where the readiness of facilities to provide care for CNCDs is limited by the low availability of essential equipment, with health services being inadequate to sustainably meet CNCD care needs over time[28]. Thus, the results from Goiás show that structural inadequacy is not an isolated phenomenon but place the state within an international context of structural inequalities in PHC.

The effectiveness of work in the UBSs depends not only on infrastructure but also on professionals' knowledge of the service area, including its characteristics, demands, contexts, and potential. Regarding territorialization, less than 48.0% of activities for mapping the service area involved identifying social structures and facilities that contribute to welcoming initiatives. Furthermore, less than 40.0% of professionals reported the presence of spaces such as open-air markets, produce markets, fruit and vegetable markets, and vegetable gardens, and less than

7.0% reported the presence of community kitchens and affordable restaurants. The availability of healthy food retail outlets in the territory is associated with the physical conditions of the food environment, which influences dietary choices[29].

A systematic review investigating the association between the food environment and CNCDs and obesity in Latin American countries revealed a positive association between healthy food retail outlets and diet quality[29]. In another study that investigated the food environment, income, and obesity in southern Brazil, obesity was inversely associated with the availability of supermarkets and healthy food establishments in the neighborhood[30]. Therefore, health teams and managers must conduct territorial mapping to identify resources and vulnerabilities and, thus, implement actions that facilitate access to healthy foods, promoting food security, especially for vulnerable groups. The food environment is a determinant of obesity risk, directly influencing access to healthy foods, diet quality, and eating behavior[31]. Thus, the low identification of these spaces in Goiás resembles international regions where a lack of physical access to healthy foods explains food vulnerability**.**

Regarding the organization of care, the study highlights the importance of health units as the PHC services for people with O/O in the state. The inclusion of other points in the Health Care Network, such as basic pharmacies, emergency services, and specialized hospitals, expands health care coverage. Furthermore, organizational care strategies predominated in PHC referral protocols for specialized care and in the stratification of severity risk. However, less than 50.0% of professionals mentioned more specific practices, such as complex case management, administration of waiting lists for appointments/surgeries, and implementation of Individualized Treatment Plans, pointing to a possible gap in the adoption of these strategies.

Similarly, a study evaluating low- and middle-income countries reveals that health services face barriers in managing CNCDs, related to waiting times, work overload, and limited professional training[32]. The lack of continuing education reported by professionals in Goiás has also been observed internationally. In their review, Parretti et al. found that the lack of technical preparation for obesity management is one of the factors that most hinders adherence to clinical guidelines[33].

Given this reality, PHC professionals must undergo continuing medical education. This ensures they are properly equipped to address the specific challenges in caring for people

with O/O[34]. Training is fundamental for the effective development and implementation of actions outlined by public health policies, ensuring an approach that meets the needs of the population[34].

International evidence shows that a lack of technical preparation is one of the most significant barriers to obesity management. The MOST Obesity Study, conducted in primary care settings in the United States, found that many professionals feel insecure, under-trained, and lacking clear organizational models to implement effective interventions, reinforcing the need for ongoing training and institutional support to sustain care[35]. These international findings align with the Brazilian context, indicating that investing in continuing education is essential to improve the quality of nutritional care.

The evaluation of FNS in this study reveals that the collection of weight, height, and the calculation of BMI is the most common practice in care. However, when considering the use of FNS tools, only one-third of professionals engaged in these more comprehensive practices, with a lower frequency of use in large municipalities. This discrepancy highlights a potential gap in the implementation of broader FNS actions that go beyond collecting basic anthropometric data. Low SISVAN coverage, the absence of population-based information, and the limited use of this information in the FNS cycle (monitoring) have been identified as limiting factors for public policy decision-making at the state and municipal levels in Brazil[36].

Recent evaluations indicate that SISVAN coverage remains limited in the country. Mourão et al. observed that, although monitoring of nutritional status has advanced in recent decades, national coverage is still insufficient[37].

Furthermore, Mrejen et al. highlighted that SISVAN coverage is regionally heterogeneous, with coverage varying according to the population's age group. This is related to municipalities with lower per capita Gross Domestic Product (GDP), lower health insurance coverage, and greater dependence on social benefits such as the Bolsa Família Program[38]. Many small municipalities in the state of Goiás have, on average, a higher per capita GDP[39], which may partially explain their better structural and organizational performance compared to medium and large municipalities.

Expanding coverage by the SISVAN of nutritional status and dietary intake across all life stages could lead to more informed and effective decisions regarding the allocation of

investments in health and nutrition, equipment and supplies, and healthcare training[36]. Furthermore, this coverage contributes to the evaluation of obesity reduction targets established by the Strategic Action Plan for Addressing Chronic and Noncommunicable Diseases in Brazil 2021–2030, which uses data from the National Health Survey, Vigitel, and SISVAN to monitor the targets established in the Plan[10,36].

Ongoing investments in infrastructure, professional training, nutritional surveillance, and network organization can significantly improve the management of CNCDs and nutritional care, enhancing the effectiveness of PHC. National training programs, such as the National Program for Improving Access and Quality of Primary Care (PMAQ-AB), reinforce that the systematic monitoring of indicators, combined with performance incentives, helps improve the structure of health units, strengthen work processes, and expand teams' capacity to provide comprehensive care. These initiatives support the implementation of the PNAN, the integration of care pathways, and the expanded use of the SISVAN, demonstrating that structural strategies yield concrete results when accompanied by technical support and stable governance[40,41].

Despite the importance of the data for understanding aspects related to the care provided to people with O/O in PHC, a potential limitation of this study is that the results are based on the perceptions of a handful of professionals, which may not reflect the reality perceived by everyone in their unit. However, this study sought to shed light on issues experienced daily by PHC professionals. The results can guide actions aimed at improving working conditions and, consequently, the quality of health care provided to individuals with O/O.

CONCLUSION

The results of this study highlight significant inequalities in the organization of care for people with O/O in Primary Health Care (PHC) in the state of Goiás. Small municipalities performed better in preventive measures, showed greater community integration, and had better infrastructure. In contrast, medium-sized municipalities exhibited weaknesses, particularly regarding territorial mapping and the organization of care pathways, indicating challenges in structuring and planning interventions. On the other hand, large municipalities exhibited the

greatest deficiencies, including inadequate infrastructure and equipment, low resolution rates, and lower adherence to data recording and analysis processes, which compromise the management and monitoring of care.

The results of this study also point to the need to intensify training initiatives for healthcare professionals and to strengthen the management of public policies focused on O/O care within the PHC system in the state of Goiás. Overcoming these challenges requires ongoing coordination of public management, financial investment, and structural measures, such as training managers and professionals, improving infrastructure, organizing the care network, and implementing intersectoral strategies. In addition, further studies are suggested to understand the disparities found among municipalities of different sizes, in order to propose effective strategies to reduce health inequalities.

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OVERWEIGHT AND OBESITY IN THE STATE OF GOIÁS, BRAZIL: ASPECTS RELATED TO PRIMARY HEALTH CARE

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