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Use of outpatient care for complementary diagnostic procedures among people with obesity in the municipalities of Cuiabá and Várzea Grande, MT

Luciene Costa de Oliveira[1], Almindo Pereira da Silva Filho[2], Bianca Mesquita de Proença[3], Renan Rodrigues[4], Rafael Leão de Moraes[5], Luciana Marques da Silva[6], Rosa Maria Elias[7], Bráulio Henrique Magnani Branco[8].

ABSTRACT

Introduction: Obesity is a chronic disease, characterized as a public health issue worldwide. It is defined by a BMI ≥30kg/m², and among all the metabolic repercussions, the main ones are cardiovascular, rheumatic and hepatic diseases. Objective: To identify the prevalence of the main procedures used to assess complications arising from obesity in the metropolitan region of Cuiabá-MT. Methodology: This is an observational, analytical, cross-sectional study, with retrospective data obtained from the Outpatient Production Information System of the Unified Health System (SIA/SUS). Results and Discussions: There were 105 outpatient visits, 83.9% of which were female. Among the exams, abdominal ultrasonography was the most performed. Conclusion: Naturally, the female public is the one that most seeks medical care, and the performance of abdominal ultrasonography was to search for possible hepatic repercussions resulting from obesity.

Keywords: Obesity, Health, Metropolis.

INTRODUCTION

The excessive accumulation of body fat, chronically, with Body Mass Index (BMI) levels ≥30kg/m², is defined by the World Health Organization (WHO) as obesity (WHO, 2023). In the modern population, obesity has been established as a global health problem, but much more than just being overweight, this pathology involves genetic, individual, collective, economic, and environmental factors (ABESO, 2019; BRAZIL, 2022).

According to data obtained from the PNS/2020 National Health Survey, 01 in 04 Brazilians is obese. In 2021, of all the 9.1 million adults who underwent a medical consultation in Primary Health Care, 04 million were diagnosed with obesity (BRASIL, 2022).

[1] University of Cuiabá (UNIC) – Mato Grosso
[2] Municipal Department of Education and Culture, Sports and Leisure of Várzea Grande – Mato Grosso
[3] University of Cuiabá (UNIC) – Mato Grosso
[4] University of Cuiabá (UNIC) – Mato Grosso
[5] University Center of Várzea Grande – Mato Grosso
[6] University of Cuiabá (UNIC) – Mato Grosso
[7] University of Cuiabá (UNIC) – Mato Grosso
[8] University Center of Maringá (UNICESUMAR) – Paraná

At the national level, obesity has increased by 72% in the last thirteen years, from 11.8% in 2006 to 20.3% in 2019. In the state of Mato Grosso, this obesity statistic in males is 21.9% and in females 23% in the same year (ABESO, 2019).

In 2022, a survey was carried out by the Unified Health System (SUS), which found that more than 34 thousand adolescents in the age group of 10 to 19 years old residing in Mato Grosso are overweight, and the monitoring was carried out in Primary Health Care and data reveal that the overweight rate exceeds 20%, obesity is at 11% and severe obesity is at 3% (BRASIL, 2022).

In view of this, in view of the frequency and severity of the disease, in 2023 LawNo. 12,063/23 was proposed in the state of Mato Grosso, which characterizes morbid obesity as a chronic disease for the purposes of accessibility and priority care, being sanctioned in the same year, in view of the recurrences and significant increase in obesity in the state **(**MATO GROSSO, 2023).

Individuals properly diagnosed with obesity have challenges that go beyond the social framework in terms of aesthetics and a socially appropriate body standard. This population faces increased risks of developing associated diseases that can gradually impair good quality of life and longevity. Among these risks is the high rate of developing cardiovascular diseases, metabolic disorders, rheumatic diseases, and other chronic non-communicable diseases (ABESO, 2016). In addition, the entire inflammatory process developed by the excessive accumulation of body fat can decrease the individual's immune response to vaccines, antibiotics and antivirals (FERREIRA *et al*., 2019).

The diagnosis of obesity is clinical, based on the estimation of BMI, the most widely used metric in the assessment of nutritional status, helping to determine the best therapeutic approaches, in addition to assessing the risk of developing comorbidities related to the disease. While the calculation is widely used, it may not fully reflect body composition as it does not differentiate between muscle mass and fat, this means that BMI may be less accurate in certain population groups, such as the elderly and athletes, as it does not consider factors such as body fat distribution. In addition, there may be disagreement in the body weight component as a function of age, sex, and ethnicity (ABESO, 2016).

In addition, the diagnosis may include the waist circumference/hip ratio (WHR), which, despite being in disuse, reflects an association with a higher probability of progression to complications. This approach, when combined with the calculation of BMI, provides a comprehensive view of the disease, since it directs precisely the risk assessment, as well as the diagnosis (ABESO, 2016).

Imaging tests, such as magnetic resonance imaging and computed tomography, can be useful for a more detailed assessment of body composition, but their high cost disfavors their use in clinical practice. In view of this, alternatives are commonly adopted to estimate the body weight component in practice, such as the sum of skinfold measurements, ultrasonography, and bioimpedance analysis, which is capable of establishing the body structure in an integral way (ABESO, 2016).

In view of the possible implications of obesity on the health of the individual, it is essential to adopt a multidisciplinary and integrated approach that considers not only the individual aspect (biological, psychological), but also the social factors (environment, socioeconomic, cultural, educational) that influence the results at different levels of health (individual, community and population). This approach recognizes the complexity of obesity and other public health-related issues (ASSIS *et al*., 2021).

The use of drugs to deal with obesity is becoming increasingly common in this century, due to transformations in eating habits, such as the proliferation of *fast foods*. In addition, factors such as stress, lack of physical activity, and difficulty quitting smoking also contribute to this increase, all of which are prevalent in modern society. Another important driver for the increased demand for obesity treatments is the excessive valuation of the body present in today's culture. Thus, in this context, there has been considerable growth in the search for drugs to treat obesity, but it is essential to exercise caution due to the potential adverse effects, as well as the specificities of indication and contraindication of each drug (NIGRO *et al*., 2021).

OBJECTIVE

Thus, due to the frequent diagnosis and severity of the disease, the objective of this study was to identify the prevalence of the search for the main procedures used to assess the complications arising from obesity in the metropolitan region of Cuiabá-MT.

METHODOLOGY

This is an observational, analytical, cross-sectional study with retrospective data obtained from the Outpatient Production Information System of the Unified Health System (SIA/SUS) available in the data repository of the Information Systems of the Mato Grosso State Department of Health (DwWeb | SES-MT), about the search for care for diagnostic procedures by obese people in the last 10 years in the metropolitan region of Cuiabá-MT.

To generate the database, a search was carried out based on the selection of people classified as obese based on the ICD10 E66 under the following codes: E66. Obesity – E66.0 Obesity due to excess calories – E66.8 Other obesity – E66.9 Obesity not specified, by diagnostic procedure group, municipality of occurrence (Cuiabá and Várzea Grande) and year of occurrence (2014 to 2023). The variables selected for the study were grouped into sociodemographic (municipality of care, age group, sex, and race/color) and care (type of care, procedure performed, and health unit of care). The results of the analysis of categorical variables (nominal and ordinal) were presented by means of tables of absolute (N) and relative (%) frequency. Bivariate analyses were performed using the Mantel-Haenszel chi-square test to evaluate the statistical association between the explanatory variables and the diagnostic procedure performed (bone

structure imaging, abdomen imaging, cardiac function, and endoscopy), considering the prevalence ratio (PR) and its respective 95% confidence interval (95%CI) as a measure of effect and a statistically significant association when p-value < 0.05.

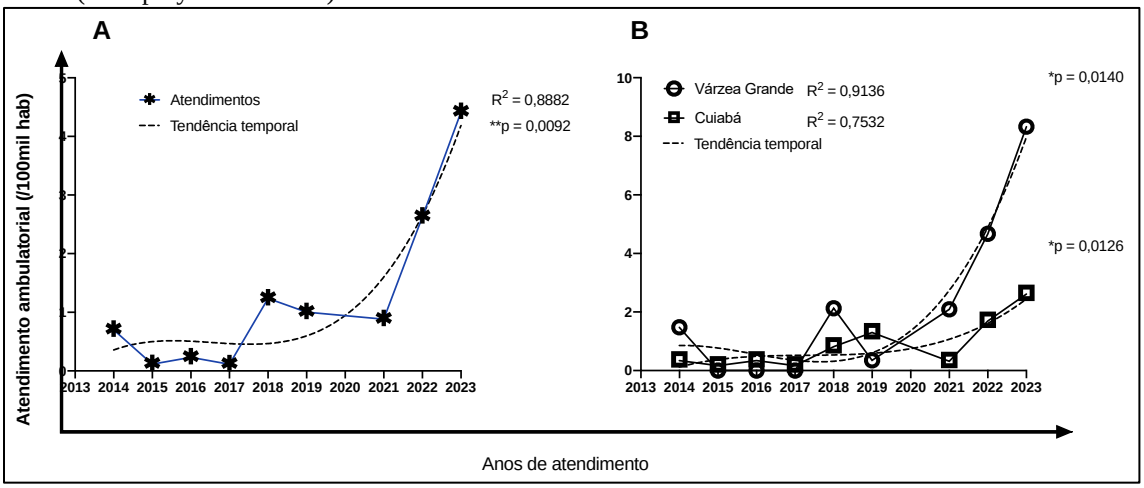
For the time series analyses, a dataset was created considering the absolute number of attendances in the numerator and, in the denominator, the estimated resident population of Cuiabá and Várzea Grande, available on the portal of the Brazilian Institute of Geography and Statistics (IBGE) in the selected period (2014-2023), with a multiplication factor per 100,000 inhabitants. The time series graphs were produced using Microsoft Excel® software, and to estimate the trend of the series, we used nonlinear regression analyses (third polynomial order) with a significance level of 5% ($p<0.05$) adopted.

All collected data were entered into Microsoft Excel® spreadsheets, then submitted to the Epi Info™ software version 7.2.4 (Centers for Disease Control and Prevention, Atlanta, United States of America) for frequency and association analysis of the dichotomized variables.

DEVELOPMENT

A total of 105 outpatient consultations for diagnostic purposes were carried out among obese people in the municipalities of Cuiabá and Várzea Grande, Mato Grosso during the study period, in the pediatric and adult age group (0 to 80 years or +), 49 in Cuiabá (47%) and 56 in Várzea Grande (53%). The analysis of the distribution of care shows an ambiguous and statistically significant temporal trend in total attendance, as well as in care by municipality during the study period (Figure 1). The attendance rate in the municipality of Várzea Grande (2.2/100,000 inhabitants) was 2.4 times higher when compared to Cuiabá (0.9/2.2/100,000 inhabitants) (**p=0.0029).

Figure 1 – Time series of outpatient production of care for total diagnostic procedure (A) and according to municipality (B) of obese people in the municipalities of Cuiabá and Várzea Grande between 2014 and 2023, using the nonlinear regression model (third polynomial order).



The increase in consultations for complementary diagnoses from 2021 onwards may have been influenced by awareness campaigns, changes in public policies, and socioeconomic factors after the COVID-19 pandemic (SMITH, DOE, BROWN, 2022). The pandemic has raised awareness of the risks of obesity, while the normalization of health services post-pandemic has facilitated access to medical care, driving an increase in diagnostic procedures (MOYNIHAN *et al*., 2021).

In the period analyzed, there was a greater search for care for diagnostic procedures among females (83.9%). The distribution of frequencies according to sociodemographic characteristics, according to the municipality of care, is summarized in Table 1.

Table 1 – Sociodemographic characteristics of care for diagnostic procedures for obese people, according to the municipality of care between 2014 and 2023.

	Cuiabá		**Várzea Grande**	
Variables	N	%	N	%
Gender				
Male	14	28,6	04	7,1
Female	35	71,4	52	92,9
Age group				
0 to 5 incomplete years	03	6,3	00	0,0
15 to 21 years old	02	4,2	00	0,0
21 to 40 years old	11	22,9	26	49,1
40 to 60 years old	28	58,3	24	45,3
60 years or older	04	8,3	03	5,7
Race/color				
Curtain	33	67,3	42	75,0
White	07	14,3	07	12,5
Black	02	4,1	00	0,0
Yellow	03	6,1	02	3,6
No information	04	8,2	05	8,9

This finding is justified by the fact that women seek more outpatient medical care when compared to men, either for preventive check-up appointments or due to some pathological symptom. According to a survey conducted by the National Health Survey – PNS, about 82.3% of women had seen a doctor in the 12 months prior to the current consultation, while only 69.4% of men had done so (COBO *et al., 2021).*

The consultations in the city of Cuiabá were carried out at the health units DIAG radiological diagnostics (n=3), Hospital e Pronto Socorro Municipal de Cuiabá (n=2), Hospital Municipal de Cuiabá and PS Dr Leony Palma Carvalho (n=21), Hospital Municipal São Benedito de Cuiabá (n=5), Hospital Santa Helena (n=2), Hospital Universitário Júlio Muller (n=2), Medclin (n=3) and Nuclear Medicine (n=2). The health units in Várzea Grande were the Specialized Health Center (CES; n=13), the Municipal Hospital and Emergency Room of Várzea Grande (n=1) and the Metropolitan State Hospital Lousite Ferreira da Silva (n=42). The prevalence of care according to the municipalities of care is described in Table 2. Most of the consultations for diagnostic procedures performed in Cuiabá were among people classified according to the international code of diseases as obesity (ICD 10 E66 = 40.8%), while in

Várzea Grande the majority were classified as obese due to excess calories (ICD 10 E66.0 = 69.6%). In both municipalities, elective care for diagnostic procedures and abdominal imaging evaluation predominated (Table 2).

Table 2 – Clinical characteristics and type of procedure performed in the care of obese people, according to the municipality of care between 2014 and 2023. *E66. Obesity; E66.0 Obesity due to excess calories; E66.8 Other obesity; E66.9 Obesity, unspecified

	Cuiabá		Várzea Grande	
Variables	N	%	N	%
ICD10 Rating				
E66	20	40,8	12	21,4
E66.0	18	36,7	39	69,6
E66.8	02	4,1	02	3,6
E66.9	09	18,4	03	5,4
Type of service				
Elective	28	57,1	45	80,4
Urgency	21	42,9	11	19,6
Bone structure imaging				
Yes	09	18,4	12	21,4
No	40	81,6	44	78,6
Imaging of abdomen				
Yes	23	46,9	35	62,5
No	26	53,1	21	37,5
Cardiac function				
Yes	04	8,2	01	1,8
No	45	91,8	55	98,2
Endoscopy				
Yes	11	22,4	04	7,1
No	38	77,6	52	92,9

Obesity is known to have metabolic repercussions throughout the body. Among the main ones are cardiovascular diseases, such as hypertension and dyslipidemia, in addition to liver involvement (MOREIRA *et al*., 2013).

Obesity, due to the excessive release of inflammatory factors, leads to insulin resistance, so that it makes the adipose tissue more lipolytic, reducing the uptake of glucose into the cells. This insulin resistance leads to excessive sodium and water retention, which deliberately contributes to increased blood pressure (FRANCISQUETI *et al*., 2015).

The main liver disease resulting from obesity is non-alcoholic fatty liver disease. This disease is characterized by the excessive accumulation of lipids within the functional liver cells, excluding those caused by excess alcohol and other liver diseases. Its severity is due to the fact that it is a silent disease that can progress to liver cirrhosis and, more aggressively, to liver failure requiring transplantation (SILVA *et al*., 2021).

Therefore, the increasing demand for outpatient procedures focused on cardiac function and abdominal ultrasonography is justified, aiming to visualize the liver and bile ducts in more detail.

We observed significant positive associations in the endoscopy outcome with the municipality of Várzea Grande (PR=3.14; 95%CI: 1.14-8.19) and females (PR=7.25; 95% CI: 1.50-33.95) and a significant reduction in the performance of diagnostic tests for cardiac function (84%) in emergency care (PR=0.16; 95%CI:1.50-33.95) (Table 3).

Table 3 – Analysis of the association between the variables of the patients and the care according to the outcome of the diagnostic procedure performed. 1) Obesity due to excess calories: a) PR: prevalence ratio; 95% confidence interval; b) Chi-square test.

	Bone structure imaging	**Imaging of abdomen**	**Endoscopy**	**Cardiac function**
	RP (IC95%)[a]	**RP (IC95%)[a]**	**RP (IC95%)[a]**	**RP (IC95%)[a]**
	p-value			
1Obesity	**0,625b**	**0,334b**	**0,271b**	**0,628b**
Yes	1	1	1	1
No	0,77 (0,36-1,6)	1,19 (0,84-1,72)	0,72 (0,38-3,39)	0,56 (0,11=2.71)
Age group	**>0.999b**	**0,767b**	**0,688b**	**0,476b**
21 to 60 years old	1	1	1	1
> 21 and 60 years or +	1,28 (0,43-4,76)	0,91 (0.60-1,69)	1,89 (0,40-11,03)	0,54 (0,09-3,52)
Municipality	**0,808b**	**0,120b**	***0,046b**	**0,182b**
Cuiabá	1	1	1	1
Várzea Grande	0,86 (0,40-1,81)	0,75 (0,51- 1,10)	3,14 (1,14-8,19)	4,57 (0,71-29,91)
Race/Color	**0.213b**	**0,807b**	**>0.999b**	**>0.999b**
Curtain	1	1	1	1
Other	0,56 (0,53-1,33)	1,07 (0,72-1,79)	1,17 (0,39-3,75)	1,12 (0,18-7,34)
Sex	**0,349b**	**0,066b**	**0,718b**	***0,034b**
Male	1	1	1	1
Female	1,51 (0,62-3.29)	0,56 (0,27-0,98)	1,21 (0,38-3,38)	7,25 (1,50-33,95)
Type of service	**0,110b**	**0,526b**	**>0.999b**	***0,0003b**
Elective	1	1	1	1
Urgency	0,77 (0,36- 1,6)	1,51 (0,80- 1,78)	1,02 (0,35-3,28)	0,16 (0,06-0,44)

Women with obesity are at higher risk of heart disease (MANRIQUE-ACEVEDO, *et al*., 2020). Biological factors such as cardiovascular risk, comorbidities, cardiac, social, and psychological changes are the motivations for lifestyle changes that influence seeking medical care and undergoing tests to monitor their health (OLIVEIRA, *et al*., 2022).

FINAL THOUGHTS

Because it is a very common disease, obesity can often be neglected by the population. Its consequences may begin silently, resulting in prior knowledge of complications only in populations that actively and continuously seek medical follow-up, while in the others, knowledge will only occur when the situation has already reached a more severe form.

Thus, it was proven that procedures were sought to monitor the possible consequences of obesity, especially cardiovascular and hepatic repercussions. Among the most active population in this search, there is the female public to the detriment of the male public.

Thus, the importance of ideal follow-up of obese patients is emphasized, in view of the serious complications that may arise because of the pathology in question.

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