FOOD AND NUTRITION IN COLLECTIVE HEALTH

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Bariatric surgeries in Espírito Santo State: characteristic and evolution of costs from 2008 to 2017

Cirurgias bariátricas realizadas no Estado do Espírito Santo: perfil e evolução dos custos entre 2008 e 2017

Abstract

Introduction: Obesity is considered an important public health problem and bariatric surgery (BS) is one of the components of the line of care for its treatment and enabling the reduction of body weight. ***Objective:*** To analyze how resources, evolution and costs of procedures related to bariatric surgery in the state of Espírito Santo from 2008 to 2017. ***Methods:*** Observational, descriptive and retrospective study, using secondary data available in the public domain files from the Hospital Information System and the Hospital and Ambulatory Information Communication System, of the Ministry of Health. The calculated indicators were BS by sex and by age group, as well as expenses with hospital and professional services. ***Results:*** There was an increase in the number of bariatric surgeries and their costs over the ten years analyzed, of 184% and 483%, respectively. We also found that 87% (n = 2.923) of the procedures performed in the female public, which had a significant quantitative number of BS in the age group from 24 to 34 years old and that the costs represented 0.85% of hospital expenses in Espírito Santo. ***Conclusions:*** There is a need to discuss an articulation with the other services in the health care network to implement a line of effective care that includes, in addition to bariatric surgery, or health monitoring by other health services, especially by Primary Care.

Keywords: Morbid Obesity. Bariatric Surgery. Health Expenses.

Resumo

Introdução: A obesidade é considerada um importante problema de saúde pública e a cirurgia bariátrica (CB) é um dos componentes da linha de cuidado para seu tratamento e viabilização da redução do peso corporal. ***Objetivo:*** Analisar as características, evolução e custos diretos dos procedimentos relacionados à cirurgia bariátrica no estado do Espírito Santo de 2008 a 2017. ***Métodos:*** Estudo observacional, descritivo e retrospectivo, baseado em dados secundários disponíveis nos arquivos de domínio público presentes no Sistema de Informações Hospitalares do Sistema Único de Saúde e no Sistema de Comunicação de Informação Hospitalar e Ambulatorial, do Ministério da Saúde. Os indicadores calculados foram CB por sexo e por faixa etária, bem como os gastos com serviços hospitalares e profissionais. ***Resultados:*** Houve crescimento no número de cirurgias bariátricas e nos custos da mesma ao longo dos dez anos analisados, na ordem de 184% e 483%, respectivamente. Também se constatou que 87% (n=2.923) dos procedimentos foram realizados no público feminino, que houve um quantitativo expressivo de CB na faixa

etária entre 24 e 34 anos e que os custos representaram 0,85% dos gastos hospitalares no Espírito Santo. *Conclusões:* Há a necessidade de se discutir a articulação, junto aos demais serviços da rede de atenção à saúde, para implementação de uma linha de cuidado efetiva que englobe, além da cirurgia bariátrica, o acompanhamento da saúde por outros serviços de saúde, em especial pela Atenção Primária.

Palavras-chave: Obesidade Mórbida. Cirurgia bariátrica. Gastos em Saúde.

INTRODUÇÃO

Obesity, characterized by the abnormal and excessive accumulation of body fat tissue,[1] has become a pathology of increasing prevalence, affecting both genders, different age groups and social classes.[2] Due to its multifactorial disease character, with epidemic proportions and often associated with an increased risk for the development of other chronic diseases, obesity has been considered an important public health problem.[3]

Treatment of obesity involves changes in the patient's lifestyle, such as changes in eating habits, insertion of regular physical activity and, in some cases, drug therapy and bariatric surgery. The success of treatment based on changing habits represents 5% to 10% reduction in initial weight, which has long been known to bring metabolic benefits.[4-8] Even more modest weight reductions have been associated with high chances results of clinically significant improvements in blood glucose, blood pressure and triglyceride and HDL levels.[9]

By understanding the complexity of the treatment of obesity and the individual characteristics of the patient, it is possible to consider that the results of weight loss are not achieved only with traditional treatment, mainly due to the modest effects of this type of treatment.[10] Thus, more severe cases may justify the use of pharmacological interventions and / or bariatric surgery (BS), being BS one of the alternatives to enable body weight reduction.[11,12]

The indication for surgical intervention occurs when body mass index (BMI) is over 40 kg / m² or over 35 kg / m² with comorbidities, such as Type II Diabetes, sleep apnea, cardiovascular diseases, osteoarthrosis, among others. In addition, conventional clinical treatment with unsatisfactory results should be carried out for at least two years.[13,14]

Data from Federação das Sociedades Nacionais de Cirurgia Bariátrica e Metabólica (Federation of National Societies of Bariatric and Metabolic Surgery) and the Sociedade Brasileira de Cirurgia Bariátrica e Metabólica (Brazilian Society of Bariatric and Metabolic Surgery) refers to Brazil as the second country with the highest number of bariatric surgeries performed, behind only the United States. It is estimated that there was a 46.7% increase in procedures from 2012 to 2017.[15,16]

In Sistema Único de Saúde – SUS (Brazilian Unified Health System), the number of surgeries, from 2008 to 2017, nationwide, grew 215%.[17] Despite this, the number is still lower if compared with the number of the private sector and the waiting lines can last from four to six years.[12,16-19] With the economic crisis experienced in the country, many Brazilians started to depend exclusively on SUS, which may have contributed to the increase in demand for BS in the states that most offer this type of service, including Espírito Santo (ES) .[16]

Knowing the evolution of costs with BS in ES is important to evaluate its impact on public resources, as well as to increase the discussion regarding how much is still necessary to invest in order to face and control the alarming numbers of obesity. Thus, this article intends to analyze the characteristics, evolution and costs of procedures related to bariatric surgery in the state of Espírito Santo in the period from 2008 to 2017.

METHOD

This is an observational, descriptive and retrospective study, based on secondary data on direct costs, with the supply of BS in the state of Espírito Santo from 2008 to 2017. The data, of public domain, were extracted from the document Hospitalization Authorization (HA), in its reduced format, using specific files for tabulation of the Hospital Information System (HIS) and the Hospital and Ambulatory Information

Communication System (HAIC), on the website of the Informatics Department of Ministry of Health (IDMH).[17,18]

The HIS registers all the attendances coming from hospital admissions funded by SUS in the country and the HAIC is a system used by Ministério da Saúde (Ministry of Health) and Agência Nacional de Saúde Suplementar (National Supplementary Health Agency), to track and monitor hospitalizations in all hospital units in the country of the private health care network.

The analysis of the state of Espírito Santo is due to the fact that this state performs the largest number of bariatric surgeries in SUS when compared to the other states in the Southeast Region. Considering the rate of bariatric surgery, Espírito Santo performed, from 2014 to 2016, three times (15.6 / 100,000 inhabitants) more than the average for the Southeast Region (5.5 / 100,000 inhabitants); in the same period, it was the second in the country's ranking to offer this procedure, if compared proportionally to the size of the population.[17]

The selection of procedures was based on the four surgical techniques defined by Ordinance GM / MS No. 425/2013, which establishes the technical regulation, standards and criteria for highly complex care for individuals with obesity and which already integrates the most commonly used techniques.[13]

Data were tabulated and analyzed using the Microsoft Excel 2016® app and TabWin version 4.14. The calculated indicators were BS by sex and by age group, as well as expenses with hospital and professional services. The population coefficient of BS (per 100 thousand inhabitants) was calculated based on the average number of hospitalizations from 2008 to 2017, divided by the population projection for the year at the midpoint (2012), obtaining two five-year periods for this assessment.

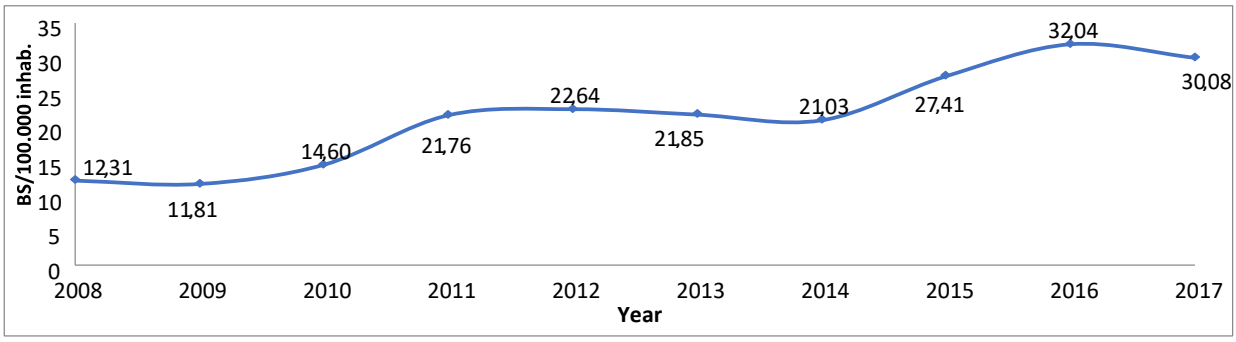
The investigation was carried out from the perspective of direct SUS expenses and does not include family expenses with transportation, food, accommodation or support for patients by family members.

RESULTS AND DISCUSSION

In the analyzed period (2008-2017) in the state of Espírito Santo, 8,158 bariatric surgeries were performed, considering SUS and the private health system. The annual variation in the amount of BS performed - 425 in 2008 to 1,208 in 2017 - represents an increase of 183% in BS offer / year. The total annual average was 588.8 in the first five-year period (2008-2012) and 1,042.8 in the second (2013-2017), which characterizes an increase of 1.8 times in the number of surgical procedures of this type compared to the first five-year period.

The analysis of BS data performed in SUS indicates an increase of 2.5 times more surgeries in the second five-year period (481.2 / year) comparing to the first period (195.6 / year). The interventions performed corresponded to an annual average of 22.8 surgeries for every 100,000 inhabitants (figure 1).

Figure 1. Evolution of the total number of bariatric surgeries registered in HIS and HAIC per 100,000 inhabitants, in the state of Espírito Santo, from 2008 to 2017.



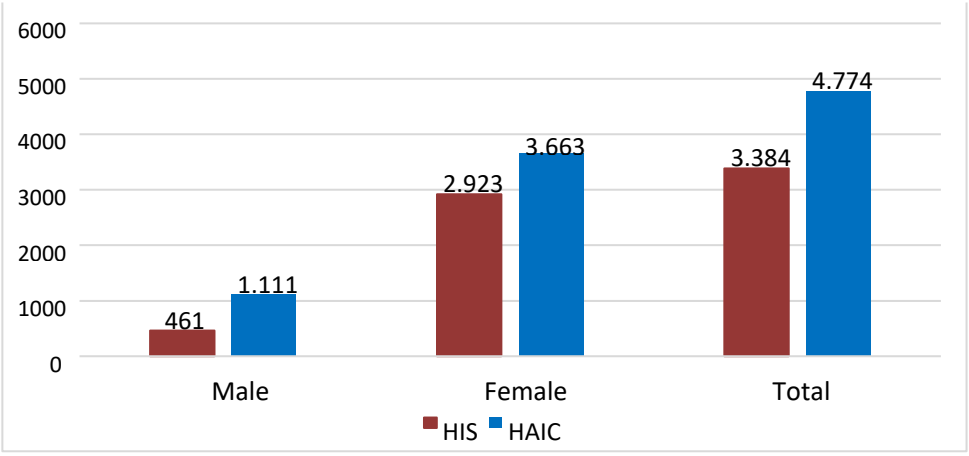
BS: Bariatric surgeries / Inhab.: inhabitants / HIS: Hospital Information System / HAIC: Hospital and Ambulatory Information Communication

Source: Prepared by the authors, based on data from the Hospital Information System and the Hospital and Ambulatory Information Communication System.

Data from the Food and Nutrition Surveillance System (FNSS) of 2019 indicate that Espírito Santo has 65.3% of its adult population with overweight and 32.6% with obesity.[20] In addition, it is, among the states of the federation, the one which most performs the surgical procedure,[16] which may have contributed to the increasing values presented.

In this study, from 2008 to 2017, 87% (n = 2,923) of the BS that occurred through SUS were directed to women. In this population, the average of interventions in the second five-year period (420.4 / year) was 2.6 times higher than the first period (164.2 / year). Regarding the records of the private health system, 3,663 procedures were found in this public (76.7%) (figure 2).

Figure 2. Total number of bariatric surgeries registered at HIS and HAIC performed in the state of Espírito Santo, from 2008 to 2017, according to gender.



HIS: Hospital Information System / HAIC: Hospital and Ambulatory Information Communication
Source: Prepared by the authors, based on data from the Hospital Information System and the Hospital and Ambulatory Information Communication System.

In males, BS were 2.4 times more frequent in HAIC records than in HIS records, in the same period. Among women, this difference was 1.3 times (figure 2).

Carvalho & Rosa, [21] continuing the study by Kelles, Machado & Barreto[22] about BS carried out by SUS throughout Brazil, also found that when comparing the period from 2010 to 2016 to the seven years immediately preceding (2003-2009), the number of bariatric surgical procedures increased 2.5 times.

The analysis of hospitalizations in public hospitals in the Metropolitan Region of Porto Alegre also highlighted the increase in surgical procedures related to BS. The 1,249 hospitalizations that culminated in bariatric surgery represented, on average, 178.4 hospitalizations / year, an increase of 40.1% comparing to the annual average of the 2008-2010 triennium, of 127.3 hospitalizations / year.[21]

The greater demand for BS in women was also found in other studies. In the investigation of the first three years of operation of the Ontario Bariatric Network in Canada, from 2009 to 2011, it was found that, considering the 5,007 patients, 82% were women.[23] The clinical sample of a Portuguese study on body image in BS pointed out that 84 , 5% of patients were women.[24]

One of the possible explanations for this number may be related to the standard of beauty imposed by society. Vanity and the search for a body model tend to be frequent behaviors of the female gender and with a greater risk of suffering in the face of excess weight than men.[25]

In our research, regarding race and color, HIS data showed that 36.5% of patients submitted to BS were self-declared as white, 28.9% as brown, 2.0% as black and for 32.4 % there was no such information in the records.

A study of the epidemiological profile of patients submitted to BS in Belém-PA also showed a higher percentage of interventions in the self-declared white population. It reported, however, that the result does not represent the majority of people who lived in the city, as 74.7% of the local population is considered non-white.[26] The same can be noticed in our analysis, considering that 57.8% of the resident population in the state of Espírito Santo is self-declared not white.[27]

In Espírito Santo, the highest concentration of surgeries carried out by SUS was found in the age group from 25 to 49 years old, corresponding to 77% of the total. On the other hand, in the private service, a higher percentage was noticed in the age group from 25 to 44 years old, with 71.2% (table 1). The age group most frequently presented in the literature is from 35 to 44 years old, [21,23] which is similar in a portion with the age group found in our study, since 36.4% of bariatric surgeries happened in the age group from 30 to 39 years old.

Table 1. Number of bariatric surgeries performed, according to age groups in the state of Espírito Santo, in public and private services, from 2008 to 2017.

Age Groups	Public Service n (%)	Private Service n (%)	Total (Public and Private) n (%)
15-19	21 (0.6)	75 (1.6)	96 (1.2)
20-24	140 (4.1)	368 (7.7)	508 (6.2)
25-29	404 (11.9)	830 (17.4)	1.234 (15.1)
30-34	599 (17.7)	1.013 (21.2)	1.612 (19.8)
35-39	633 (18.7)	901 (18.9)	1.534 (18.8)
40-44	520 (15.4)	655 (13.7)	1.175 (14.4)

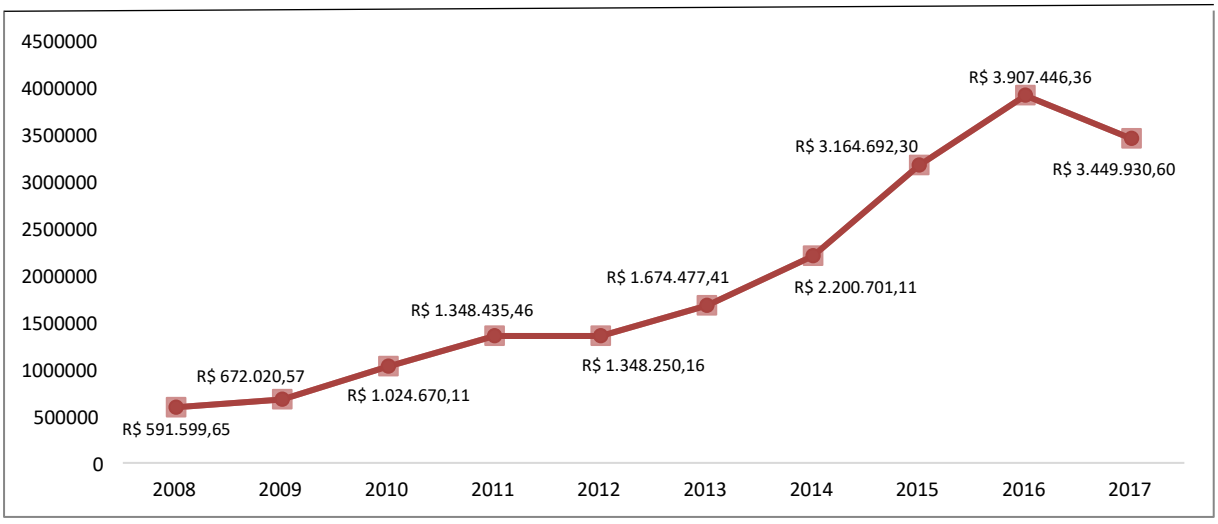
Table 1. Number of bariatric surgeries performed, according to age groups in the state of Espírito Santo, in public and private services, from 2008 to 2017.(Cont).

Age Groups	Public Service n (%)	Private Service n (%)	Total (Public and Private) n (%)
45-49	451 (13.3)	403 (8.4)	854 (10.5)
50-54	300 (8.9)	273 (5.7)	573 (7.0)
55-59	204 (6.0)	166 (3.5)	370 (4.5)
60-64	90 (2.7)	54 (1.1)	144 (1.8)
65-69	15 (0.4)	26 (0.5)	41 (0.5)
≥ 70	7 (0.2)	10 (0.2)	17 (0.2)
Total	3.384 (100.0)	4.774 (100.0)	8.158 (100.0)

Source: Prepared by the authors. based on data from the Hospital Information System and the Hospital and Ambulatory Information Communication System.

The total cost with procedures related to BS in ES by SUS, from 2008 to 2017, was R $ 19,422,063.04, with a variation between R $ 591,599.65 and R $ 3,907,446.36, representing an increase of 483% (figure 3). The annual average in the analyzed period was R $ 1,938,222.37, with a total cost per patient of R $ 5,739.38. The expenses with BS in the second five-year period (R $ 2,879,449.56) were 2.9 times higher than in the first period (R $ 996,995.19). The state of ES tracks the average cost with BS per patient estimated for the Southeast Region (R $ 5,740.46) and is slightly above the national average (R $ 5,719.77) .[17]

Figure 3. Costs evolution with bariatric surgeries performed by SUS in the state of Espírito Santo. from 2008 and 2017.

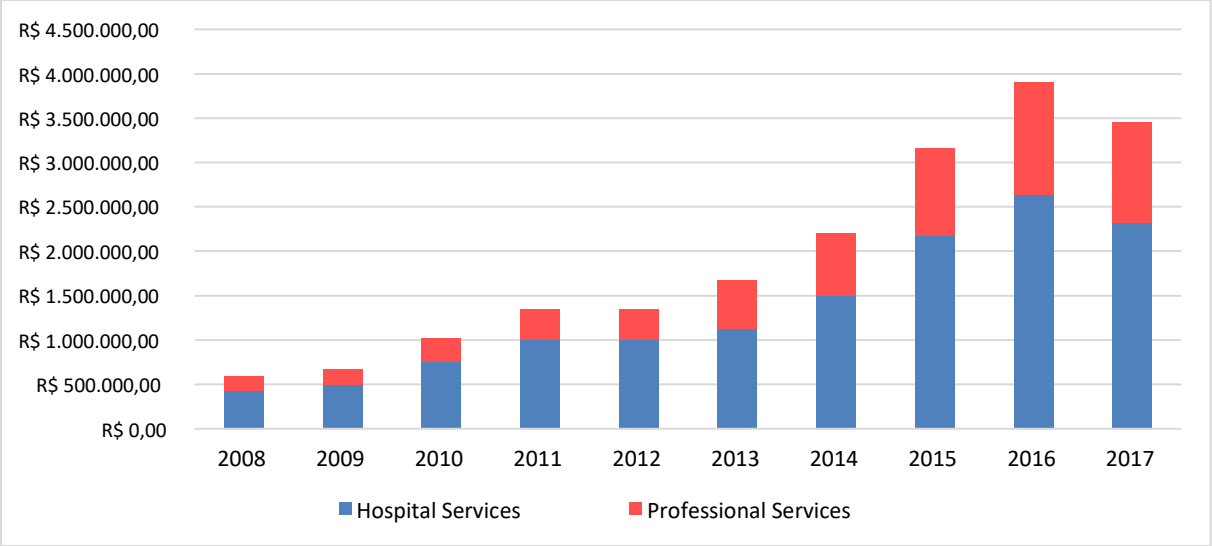


Source: Prepared by the authors. based on data from the Hospital Information System and the Hospital and Ambulatory Information Communication System.

The growth in the number of procedures and costs related to BS was compatible with the findings of other studies. Finkelstein and Kruger, when analyzing representative data of the North American population from 1998 to 2006, noticed that obesity-related health expenses practically doubled in the period (from $ 78.5 billion to $ 147 billion) .[28]

In the analysis carried out in our study, expenses with hospital services (R$ 13,487,962.55), from 2008 to 2017, were equivalent to 69% of the total cost with BS and professional services (R$ 5,934,100, 49) to 31% of the cost (figure 4). Costs related to BS represented 0.85% of SUS hospital expenses in ES in the ten years period analyzed.

Figure 4. Expenses with hospital and professional services in SUS in the state of Espírito Santo. from 2008 to 2017.



Source: Prepared by the authors. based on data from the Hospital Information System and the Hospital and Ambulatory Information Communication System.

An analysis carried out in Porto Alegre-RS, in the period from 2010 to 2016, noticed that hospitalizations related to BS represented 0.33% of the expenses of the public health system.[21] ES is one of the states that most performs BS in the country and this may justify the higher percentage related to total health expenses.

An investigation carried out in Portugal about the costs of obesity found that the portion of hospital costs represented 29% of total health expenses.[29] In Spain, in 2011, obesity was responsible for 7% of total health costs, [30] similar to the United States, where it is estimated that the budget of obesity on health systems is responsible for 5.5 to 7% of national health expenses.[31] In Brazil, a study conducted in 2011 showed that SUS spent R$ 488 million annually on the treatment of diseases associated with obesity; in addition, the costs of treating severe obesity now reach R$ 116 million.[32]

Cost studies like this are important not to point out the economic burden of care for specific diseases, but because it makes public that effective care based on scientific evidence, in the logic of wholeness, can often reduce the demands for health care and improve the quality of life of patients, consequently reducing costs with these diseases. Despite the limitations arising from the use of HIS and HAIC databases, with important data about the patient missing, in addition to the possibility of errors in diagnosis and coding, this study brings a fundamental analysis about the costs with BS, contributing to the reflection that obesity care is complex and needs coordinated actions in a complete care line.

CONCLUSION

The study pointed to an increase in the number of BS and its costs over ten years in the state of Espírito Santo. An expressive quantity of BS was also found in the public of young adults, from 30 to 39 years old. It

is also noteworthy that there is a repressed demand and that the number of admissions by SUS to perform BS tends to increase each year, due to several factors, such as epidemiological, socioeconomic changes and access to the health system in the country in the last few years.

Although BS may require a high initial investment, it may also predispose to a reduction in public expenses on obesity, its complications and consequences in the long run. This procedure should be seen as part of the whole treatment, not just as an isolated action.

Therefore, there is a need to discuss the articulation among the other services of health care network, in order to implement effective cares that include, in addition to bariatric surgery, health monitoring of individuals with obesity in their areas, carried out by other levels of health services, especially through Primary Health Care

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