



# Perceptions of Adult Individuals, Candidates for Bariatric Surgery, About their Oral Health Conditions

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## Abstract

The objective of this study was to describe the perceptions of adult individuals, candidates for Bariatric Surgery (BS), regarding their oral health conditions, as well as the clinical and epidemiological profile of this group. From this perspective, a cross-sectional and retrospective study was developed, using secondary data from the dental evaluations of patients assisted by the Bariatric and Metabolic Surgery Service of the Hospital das Clínicas, Ebserh, Federal University of Pernambuco (HC-Ebserh-UFPE), in Recife. This study utilized part of the variables collected during a Master's Dissertation research, conducted between 2023 and 2024. A total of 34 records of individuals of both genders were analyzed, with a mean age of  $49.0 \pm 7.5$  years. The majority (85.3%) were female and had class II or class III obesity (94.1%), that is, a Body Mass Index (BMI) equal to or greater than  $35 \text{ kg/m}^2$  and a Neck Circumference (NC) greater than 40 cm for men and greater than 37 cm for women. The presence of comorbidities was identified in 82.4% of the cases, mainly Systemic Arterial Hypertension (SAH), also associated with type 2 Diabetes Mellitus (T2DM) in 26.5% of the records, or with a prediabetic condition. A perception of poor or compromised oral health was reported in 91.2% of the analyzed records, while regular oral hygiene was noted in 47.1%. Gingival bleeding, orofacial pain, and problems related to tooth loss or poorly fitted dental prostheses were the most frequent causes associated with negative perceptions of oral health. According to the records, only 8.8% of the adults who were candidates for BS had a dental appointment within the last two years, suggesting a need for greater attention from Dentistry toward this population group.

**Keywords:** Obesity morbid; Bariatric surgery; Adult; Oral health

## Introduction

Obesity is currently one of the greatest challenges facing global public health. It is a condition characterized by excessive accumulation of body fat, which has a number of implications for the physical, psychological and social well-being of the individual. According to projections by the World Health Organization (WHO), it is estimated that by 2025 more than 700 million adults will be living with obesity, highlighting the urgent need for preventive strategies and effective treatments [1-4]. In Brazil, this reality is also alarming, with increasing rates of this

chronic disease, especially among adults, which has led many to resort to bariatric surgery (BS) as a therapeutic alternative. BS has proven to be an effective intervention for treating severe obesity — especially in cases where there are associated comorbidities, such as high blood pressure, type 2 diabetes, and lipid disorders. Certain parameters are important for indicating this surgery, such as a body mass index (BMI) equal to or greater than  $40 \text{ kg/m}^2$ , or from  $35 \text{ kg/m}^2$  in the presence of significant comorbidities. In addition, studies raise other complementary anthropometric measures such as neck (or cervical) circumference when it exceeds 40 cm in men and 37 cm in women, indicating possible

excess body fat in the upper trunk region; Abdominal Circumference (AC) greater than 102 cm in men and 88 cm in women, and waist-to-hip ratio and body fat percentage, among others [5-9]. It should be noted that the impacts of obesity go far beyond the cardiovascular and metabolic systems. In recent years, studies have pointed to a strong relationship between obesity and significant changes in oral health (OH) and orofacial function. It particularly affects chewing, salivation and swallowing, as well as promoting the onset of periodontal disease (PD) and hindering the use of dental prostheses. Thus, chewing behaviour needs to be carefully assessed and monitored in individuals with this chronic disease. Scientific evidence shows that increasing the number of chewing cycles slows down the pace of eating and can significantly reduce caloric intake, improve the perception of satiety and modulate the release of appetite-regulating hormones. These hormones include ghrelin (a hunger hormone that stimulates appetite), cholecystokinin (CCK), and glucose-dependent insulinotropic polypeptide (GIP), which are involved in the feeling of satiety and regulation of insulin release [1,10-12]. Regarding what was previously mentioned, another point that deserves attention is related to gaps in follow-up by dental professionals in the pre- and post-operative periods of bariatric surgery, even though studies show a negative impact of this surgical procedure on the oral health conditions of obese individuals and the need to measure conditions in the pre-operative period, minimizing possible post-surgical complications; here directly linked to the chewing performance and quality of life of these individuals. Given this scenario, it is essential to understand how these individuals perceive their own OWH and what factors — clinical, social, and behavioural - influence this perception. This type of research can provide important insights for the creation of educational and preventive strategies, with actions that integrate dental care into the multidisciplinary team responsible for monitoring these patients.2,10. Thus, the present study aims to analyses how adults with severe obesity, who are candidates for bariatric surgery, assess their own BS.

## Method

This was a cross-sectional, retrospective study with descriptive analysis of secondary data. The current study was conducted in the Department of Clinical and Preventive Dentistry (DCOP) at UFPE, in Recife. The research covered data collected in interviews with adult candidates for bariatric surgery by the Bariatric and Metabolic Surgery Service of HC-Ebserh-UFPE, a reference service for the treatment of morbid obesity. Even though dentistry is not officially recognised as a health specialty linked to the service, to date, a team of dental surgeons, professors and undergraduate and postgraduate students at UFPE participate in interviews, assessments, guidance and referrals and

necessary dental treatments (according to feasibility) both in the hospital setting (patients in ward beds, in the pre-surgical phase) and at the DCOP/UFPE facilities. The flow for people with obesity who are candidates for the procedure in question goes through several specialists, divided into 'Kits.' In Kit 1, with opinions from Nutrition, Psychology, Nursing, Social Work, Physical Education, Endocrinology, and Speech Therapy, in addition to laboratory tests. In Kit 2, with opinions from Cardiology, Pulmonology (at the outpatient and preoperative levels), with the following tests: ultrasound, digestive endoscopy, laboratory tests, and chest X-ray. After assessment by the speech therapist and confirmation of changes in form and structure that impact orofacial function, particularly chewing, the patient is referred for assessment and consultation with a dentist. The database for the current study was compiled based on assessments conducted between 2023 and 2024 actions taken during the development of the master's thesis by dental surgeon Íthalo José Alves da Silva Cruz, approved by the Research Ethics Committee (CEP) of HC-Ebserh-UFPE, under opinion number 6,686,456. To build the database for the current study, the following clinical and demographic variables were considered: anthropometric data, presence and type of comorbidities, perception of oral health conditions, quality of oral hygiene, complaints in the orofacial region, and time elapsed since the last visit to the dentist, in addition to gender and age. The database was organized in a Windows 11 Excel spreadsheet, with descriptive analysis enabled, respecting the storage period for these data.

## Results

The descriptive analysis was presented in two tables. The mean age recorded for adult BS candidates was  $49.0 \pm 7.5$  years. As shown in (Table 1), 85.3% of the records were of female individuals with obesity class II or III. The most prominent comorbidity was SAH. In the case of DM2, if not recorded, it was classified as "prediabetes." As can be seen in (Table 2), although most of the data characterised the oral health condition of BS candidates as poor or precarious, there was a higher frequency of regular oral hygiene for the items recorded. Regarding the main complaints in OB, orofacial pain obtained the highest number of citations, generally with the terms during chewing, in the TMJ region and when opening or closing the mouth. For PD, there were reports of spontaneous or brushing-induced gingival bleeding, tartar, halitosis, tooth mobility, and changes in the insertion of the lingual frenulum, with gingival retraction. The item 'others' had a high frequency, as it incorporated the affirmation of complaints without specific or a need to schedule appointments for a particular dental specialty: Endodontics, Dental Prosthetics, Implantology and Orthodontics; the latter with mention of AOS or bruxism. Also, according to Table 2, the last

dental appointment for this group of people was more than two years ago, considering the date of the survey.

**Table 1:** Clinical and demographic characteristics recorded for adult individuals who were candidates for BS at HC-Ebserh-UFPE. Recife, 2023-2024.

| Variable  | n         | %            |
|---|-----------|--------------|
| <b>TOTAL</b>  | <b>34</b> | <b>100.0</b> |
| <b>Age (year)</b>   |           |              |
| 18 a 39   | 6         | 17.6         |
| 40 a 59   | 28        | 82.4         |
| <b>Gender</b>   |           |              |
| Male  | 5         | 14.7         |
| Female  | 29        | 85.3         |
| <b>Degree of Obesity*</b>   |           |              |
| I (IMC 30,0 a 34,9Kg/m <sup>2</sup> )   | 2         | 5.9          |
| II (IMC 35,0 a 39,9Kg/m <sup>2</sup> )  | 28        | 82.3         |
| III (IMC ≥ 40,0Kg/m <sup>2</sup> )  | 4         | 11.8         |
| <b>Presença de Comorbidades</b>   |           |              |
| Sim   | 28        | 82.4         |
| Não   | 6         | 17.6         |
| <b>Presence of Comorbidities **</b>   |           |              |
| HAS DM2   | 23        | 67.6         |
| HAS+DM2   | 2         | 5.9          |
|   | 9         | 26.5         |
| * The CC or neck circumference was > 40 cm for men and > 37 cm for women. ** More than one answer possible. |           |              |

**Table 2:** Perceptions of oral health conditions and time elapsed since last dental visit among candidates for bariatric surgery at HC-Ebserh-UFPE. Recife, 2023–2024.

| Variable                              | n         | %            |
|---------------------------------------|-----------|--------------|
| <b>TOTAL</b>                          | <b>34</b> | <b>100.0</b> |
| <b>Self-perception of oral health</b> |           |              |
| Good                                  | -         | 0,0          |
| Fair                                  | 3         | 8,8          |
| Poor or inadequate                    | 31        | 91.2         |
| <b>Oral hygiene</b>                   |           |              |
| Good                                  | 7         | 20.6         |
| Fair                                  | 16        | 47.1         |
| Good or inadequate                    | 11        | 32.3         |
| <b>Orofacial complaints* (n60)</b>    |           |              |
| Orofacial pain                        | 16        | 26.7         |
| PD                                    | 13        | 21.7         |
| Tooth loss/no prosthesis              | 4         | 6.7          |
| Failure to adapt dental prosthesis    | 4         | 6.7          |
| Malocclusion                          | 7         | 11.7         |
| Others                                | 16        | 26.7         |

| Time elapsed since last visit to the dentist |    |      |
|--|----|------|
| <2 years                                     | 3  | 8.8  |
| From 2 to < 5 years                          | 16 | 47.1 |
| Starting from 5 years                        | 15 | 44.1 |

**\*\* All present complaints in the orofacial region; in three cases, the complaints were previously treated with CD. There could be more than one answer for the item in question, totalling 60.**

## Discussion

Comparing the results obtained in this study with other studies found in the literature was not a simple task, both because of the subject matter, which still has much to be explored, and because of the methodology adopted and, above all, because of the preoperative phase for BC, with most studies being postoperative. Based on the data obtained on clinical and demographic variables and comparing it with the study by Vieira [13], most individuals with obesity were also female, but the average age of the current study's records was almost a decade higher and the average BMI was lower than that established by these authors (47.3 kg/m<sup>2</sup>). Although other variables such as education or length of study, marital status, and occupation, among other information, were recorded in the database, they were not explored for the proposed objectives, which is why they cannot be compared. According to Mores et al, candidates for bariatric surgery often have respiratory disorders, such as obstructive sleep apnoea (OSA), mainly due to the accumulation of fat in the neck region (increased circumference). These metric values also represent indicators of other health conditions, such as increased insulin resistance, inflammation, and endothelial dysfunction and, with regard to orofacial functions, sagging cheeks, a large tongue, and impaired chewing. It should be noted that one of the anthropometric parameters of the current study was the increase in cervical or neck.

Hsu and Farrell<sup>5</sup> found a reduction in DM2 to be one of the main goals of CB and Metabolic, which would reinforce the indication for this procedure, even in individuals with grade I obesity. According to the records presented in Table 1, the largest number of data occurred for subjects with grade II obesity, and SAH was the most frequently described comorbidity, sometimes linked to DM2. With regard to OH conditions more directly, Malik et al, stated that although SB behaviours are not associated with increased BMI, patients with clinically severe obesity have eating behaviours and oral hygiene habits that can complicate both nutritional treatment and dental treatment demands. According to the analysis in Table 2, in the Results, it can be seen that the perception of SB was quite negative; however, the perception of oral hygiene was rated as “fair”. According to Sharma et al.,<sup>11</sup> OH plays a crucial role in obesity control. These authors' study suggests an association between obesity and oral diseases, including PD, dental caries, dental erosion, xerostomia, and dentine hypersensitivity. In this context and compared to the

complaints catalogued in the current study (Table 2), the following were observed: orofacial pain, PD, tooth loss (without the use of dentures), malocclusion and other situations. We agree with these authors that maintaining OWH is highly relevant for individuals with obesity, as compromised dental units or discomfort in the orofacial region can negatively influence healthier eating habits. When analysing the time elapsed since the last visit to the dentist (Table 2), an interval of between two and five years can be seen for the most vulnerable group. This longer interval may involve physical limitations (of access) to the service, whether due to mobility difficulties, social conditions or the logistics of this care, which constitutes a major challenge, especially in the public health sector. This has been the biggest barrier faced by BS candidates from where the data originated and the reason for the search for new strategies to address and overcome these ‘obstacles. According to Malik et al, there is a lack of studies linking body mass index (BMI) and the use of dental services with oral and general health, quality of life, well-being and mental health. The authors in question did not identify a significant correlation between BMI and variables related to the use of dental services, but they did find a negative correlation between anxiety about dental treatment and the use of these services, with impacts on well-being, quality of life and mental health.

## Conclusion

Among the data of adult candidates for CB considered in the present study (from the database), there was a negative perception of SB conditions, with an average perception in terms of oral hygiene. There are many complaints or unmet demands for dental treatment and a period of more than two years since the last consultation; these facts need to be changed as soon as possible in order to improve the chewing function, self-esteem and quality of life of this vulnerable group of people.

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