

Brazilian oral and maxillofacial prosthesis: a dentistry potent expanding specialty

Daiane Amador Fraga Martins¹ , Adriana Corsetti² ,
Natália Batista Daroit^{1,2*} 

¹ Faculdade de Odontologia, Atitus Educação, Porto Alegre, Rio Grande do Sul, Brazil.

² Faculdade de Odontologia, Universidade Federal do Rio Grande do Sul, Porto Alegre, Rio Grande do Sul, Brazil.

Corresponding author:

Natália Batista Daroit
R. Ramiro Barcelos 2492/503.
Porto Alegre, RS, Brazil.
CEP 90035-004
natalia.daroit@ufrgs.br
phone number: 51 3308-5011

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Oral and maxillofacial prosthesis (OMP) is a specialty of Dentistry for prevention, protection, functional, and orofacial rehabilitation. **Aim:** The present study aimed to describe the OMP Brazilian panorama, verifying specialists, patient access forms, and service characteristics. **Methods:** OMP specialists were identified on the Federal Council of Dentistry (CFO) website. Additionally, professionals linked to the specialty were invited to answer a questionnaire (Google Forms®) through email or social networks. The questionnaire was available between October and November 2022. Data referring to the professional, service, and assistance were collected. **Results:** CFO records showed 89 active registered OMP specialists. There were 35 responses to the online questionnaire. The majority of participants were women (74.1%), who were non-specialists (51.9%), with an average age of 54.26 years, while some were specialists in other areas of training such as dental prostheses and oral and maxillofacial surgery. Concerning services comprised universities, institutes, hospitals, and private networks, and most OMP services were located in the southeast region, especially in São Paulo, followed by the northeast and south regions. As for the developed prostheses, the most frequent etiology was malignant pathology, and the produced type is the ocular, followed by the obturator. **Conclusions:** We concluded that OMP is still under development in Brazil and the number of professionals is small and regionalized. There is an imperative to establish new, specialized training centers and decentralize the presence of professionals, thus expanding access and enhancing services for oral and maxillofacial prostheses throughout Brazil.

Keywords: Maxillofacial prosthesis. Dental prosthesis. Prosthodontics.



Introduction

Oral and Maxillofacial Prosthesis (OMP) is a dental specialty for prevention, protection, functional and aesthetic rehabilitation of missing oral and facial regions, using prostheses and devices. It aims to restore masticatory, phonetic, and aesthetic functions, as well as enhance confidence, safety, and quality of life¹. This specialty expertise comprises patients who have oral and maxillofacial deformities owing to different etiologies: Patients who have deformities of traumatic origin, congenital malformations, and neoplastic, which can be benign or malignant². The rehabilitation of these patients with plastic surgery is often not possible, and OMP becomes a great resource for those left with irreparable sequelae³.

OMP can be classified into intraoral and extraoral and further subclassified into temporary and definitive^{1,4}. They are used to rehabilitate several anatomical areas, including nasal, auricular, ocular, facial, oculopalpebral, or association of more than one anatomical area in the same prosthesis⁵. Intraoral prostheses may also be associated with extraoral use⁶. The type of prosthesis used depends on the region and size of the defect to be repaired, adjacent tissues, and the condition of the patient or family member for maintenance of the prosthesis and oral hygiene⁷.

Most patients treated by OMP specialists have deformities owing to neoplastic etiology. According to the Brazilian National Cancer Institute, head and neck cancer rates are alarming. Approximately 76% of cases are discovered in an advanced stage, making treatment difficult and leading to significant postoperative surgical defects⁸. Trauma is another cause for patients receiving OMP rehabilitation. Maxillofacial fractures are strongly associated with severe morbidity, loss of function, and deformity⁹. The most common congenital etiologies are cleft lip and palate, auricular malformations, agenesis, and, rarely, nasal agenesis and malformations¹.

In Brazil, few professionals are registered in the OMP specialty¹⁰. Information regarding OMP professionals, available services, locations, access forms, and treatments carried out enhances public knowledge, assists in planning healthy public services, and provides an appreciation of the specialty in Brazil. This study aimed to survey the Brazilian overview of OMP to describe both the services and professionals working in OMP in Brazil.

Materials and Methods

This descriptive cross-sectional study was approved by the Atitus Educação Research Ethics Committee (CAAE 59600322.1.0000.5319). Initially, a search was carried out in the Federal Council of Dentistry (CFO) public database identifying all dentists and those registered as specialists in OMP by state. Furthermore, a comparison of the density of specialists was made regarding the total population of the local site according to the Brazilian Institute of Geography and Statistics¹¹.

Additionally, an internet search (Google) was carried out with the keywords “Prótese Bucomaxilofacial” to identify the services linked to this specialty. After placing

the contact of those responsible, an invitation to participate in the survey was sent through e-mail and social media (WhatsApp® and Instagram®). The invitation was also made in person to professionals working in Brazil who attended the Latin American Congress of Oral and Maxillofacial Rehabilitation, 2022 edition. After accepting and signing the online informed consent form, the participant answered a questionnaire (Google Forms®).

Institutions and professionals involved with OMP and its services in Brazil either for free or as non-profit organizations were included in this study. Dentists and institutions not involved in OMP or exclusively providing privately funded prosthetic services were excluded from the study. The interviewees' self-analysis identified if their profile suited the research. The participants answered the questionnaire containing questions related to their personal and institutional profile, including details regarding services, such as the prostheses, their types, quantities produced, and average production time.

Each question was analyzed to determine the number and percentage of responses. Data were analyzed and recorded in database software (Microsoft Excel®). A descriptive analysis of the data with mean and standard deviation was performed.

Results

A total of 89 OMP specialists were found in the CFO website database. The distribution of specialists in OMP is irregular across Brazil, with most professionals located in the Southeast region. The highest concentration is in the state of São Paulo, with 52 registered OMP specialists, while other states such as Acre, Amapá, Bahia, Paraíba, and Espírito Santo did not present any record (Table 1).

Table 1. Distribution of dentists and OMP specialists and ratios in Brazil across Federal administrative regions and states.

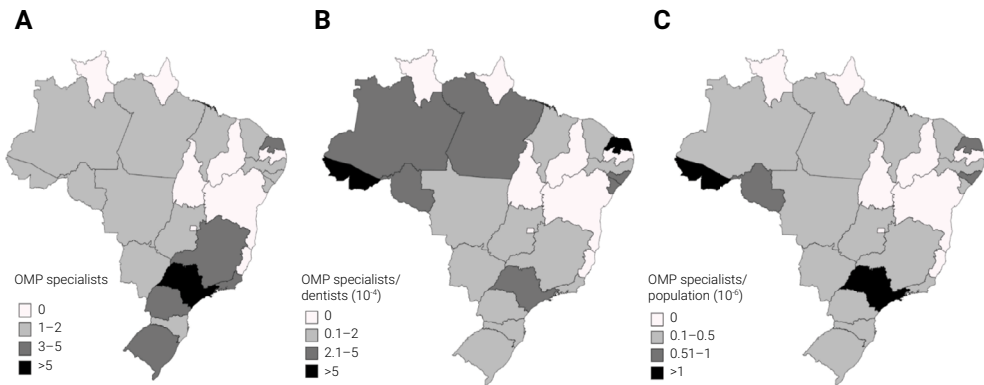
Region/State	OMP Specialists (n)	Dentists (n)	OMP specialists/ dentists ratio (10 ⁻⁴)	OMP specialists/ population ratio (10 ⁻⁶)
NORTH				
Acre	1	1.322	7,56	1,20
Amapá	0	1.487	0	0
Amazonas	2	6.221	3,21	0,50
Pará	2	8.174	2,44	0,24
Rondônia	1	3.043	3,28	0,63
Roraima	0	1.155	0	0
Tocantins	0	2.988	0	0
Subtotal	6	24.390	2,46	0,34
NORTHEAST				
Alagoas	2	4.166	4,8	0,63
Bahia	0	19.123	0	0

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Continuation				
Ceará	1	10.768	0,92	0,11
Maranhão	1	6.771	1,47	0,14
Piauí	0	4.396	0	0
Pernambuco	2	12.782	1,56	0,22
Sergipe	1	2.895	3,45	0,45
Paraíba	0	7.005	0	0
Rio Grande do Norte	3	5.162	5,81	0,90
Subtotal	10	73.068	1,36	0,18
MIDWEST				
Distrito Federal	0	9.343	0	0
Goiás	2	14.839	1,34	0,28
Mato Grosso	1	7.045	1,41	0,27
Mato Grosso do Sul	1	5.286	1,89	0,36
Subtotal	4	36.513	1,09	0,24
SOUTHEAST				
Espírito Santo	0	7.837	0	0
Minas Gerais	5	49.052	1,01	0,24
Rio de Janeiro	5	36.984	1,35	0,31
São Paulo	52	111.572	4,66	1,17
Subtotal	62	205.445	3,01	0,73
SOUTH				
Paraná	3	24.512	1,22	0,26
Rio Grande do Sul	3	21.820	1,37	0,27
Santa Catarina	1	16.836	0,59	0,13
Subtotal	7	63.168	1,10	0,23
Total	89	402.584	2,21	0,43

Source: Federal Council of Dentistry. (<https://website.cfo.org.br/>) and Brazilian Institute of Geography and Statistics (IBGE) (<https://www.ibge.gov.br/cidades-e-estados.html>) December 2023.

A comparison between the total number of OMP specialists, dentists, and population was performed to obtain the density of these professionals by state (Figure 1). Despite the state of São Paulo showing the highest number of specialists, states such as Acre, Alagoa, and Rio Grande do Norte had a higher density of OMP specialists. On comparing the OMP specialists/habitants ratio, states such as Acre (1.20), São Paulo (1.17), and Rio Grande do Norte (0.9) presented the highest taxa, while Ceará (0.11), Santa Catarina (0.13), and Maranhão (0.14) demonstrated minor results.



A) Number of OMP specialists per state (n). B) OMP specialists/dentists ratio per state (10^4). C) Number of OMP specialists/population ratio per state (10^6).

Figure 1. Distribution of Brazilian OMP specialists

Of the 35 professionals who began answering the questionnaire, five did not fit the research profile, and one was not interested in participating in the research. A total of 29 responses were collected, two of which were excluded owing to incomplete data and a total of 27 answers comprised the sample.

Of the professionals involved in OMP services in Brazil who answered the questionnaire, the majority were women (74.1%), with an average age of 54 years. There were 51.9% of professionals who were non-specialists (dentists who, while not specializing in OMP, were actively involved with OMP procedures), while 92.5% of them were specialists in other areas, such as dental prosthesis (33.3%) and oral and maxillofacial surgery (22.2%), among other specialties described in Table 2.

Table 2. Demographic data of survey respondents.

Characteristics	
Gender	n (%)
Female	20 (74,1%)
Male	7 (25,9%)
Age	Mean (DP)
	54,26 (\pm 8,09)
OMP Specialists	n (%)
Yes	13 (48,1%)
No	14 (51,9%)
Another dental specialty	n (%)
Dental prosthesis	9 (33,3%)
Oral and maxillofacial surgery	6 (22,2%)
Stomatology/ Implantology	2 (7,4%)

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Continuation	
Not informed	2 (7,4%)
TMD and Orofacial Pain	1 (3,7%)
Dentistry	1 (3,7%)
Stomatology	1 (3,7%)
Implantology	1 (3,7%)
Dental prosthesis/ Implantology	1 (3,7%)
Sports Dentistry/Orthodontics	1 (3,7%)
Facial Harmonization	1 (3,7%)
Oncology	1 (3,7%)
Type of service	n (%)
University	10 (37%)
Private	8 (29,6%)
NGO/ Foundation/ Institute	4 (14,8%)
Hospital	3 (11,1%)
Private / Agreement with the State	1 (3,7%)
Not informed	1 (3,7%)

The majority of the specialists were related to universities (37.03%), followed by 29.6% without a connection, 14.8% with non-governmental organizations (NGOs)/Foundations, 11.1% with hospitals, and 3.7% were associated with private institutions with state agreements.

The location of the services mapped demonstrated that 14 were in the Southeast region, 9 in the state of São Paulo, 6 in the Northeast, 5 in the South region, 2 in the Midwest, and the North region had no local service (Table 3).

Table 3. Characterization of OMP services in Brazil

Type of institution	Institution
University	University of São Paulo
	University of Fortaleza
	Federal University of Rio Grande do Sul
	Federal University of João Pessoa
	University of Vale of Paraíba
	University of Brasília
	Federal University of Ceará
	Faculty of Dentistry of Ribeirão Preto – USP
	Federal University of Minas Gerais
	State University of Rio de Janeiro

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NGO Foundation/ Institute	Adapta – Camaleão Institute
	National Cancer Institute/ HC1 Hospital (INCA)
Hospital	NGO – Instituto Mais Identidade
	Hospital for Rehabilitation of Craniofacial Anomalies – Bauru/São Paulo
	Rehabilitation Hospital – Worker's Hospital Complex
Private	Hospital AC Camargo
	Private – Rio Verde/GO
	Private – São Paulo
	Oncobio/Oncoclínicas
	Private – Londrina/ PR
	Private – São Luís do Maranhão
	Private – Campinas/SP
	Private – Taubaté/SP
Private / Agreement with the State	Private – Recife/ PE
	Secretary of Health of the State of Santa Catarina
Location of Services by Region	
North	0
North East	6 (22,2%)
Midwest	2 (7,4%)
Southeast	14 (51,8%)
South	5 (18,5%)
Year of implementation	Mean (SD)
	2000 (\pm 22,48)
Number of OMP Specialists	
0	10 (37%)
1	12 (44,4%)
2	0 (0%)
3	1 (3,7%)
4	1 (3,7%)
5	1 (3,7%)
Not answered	2 (7,4%)
The Service is totally Brazilian Unified Health System subsidized	
No	14 (51,9%)
Yes	11 (40,7%)
Not answered	1 (7,4%)

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Does the service receive any government subsidy or another sponsor?	
No	18 (66,7%)
Yes	6 (25,9%)
Yes, when it involves notices and projects	1 (3,7%)
Not answered	1 (3,7%)
Is there a cost or fee per patient served?	
No	12 (44,4%)
Cost of prosthesis	7 (25,9%)
Attendance rate	5 (18,5%)
Not answered	1 (3,7%)
Sporadic cases	1 (3,7%)
Fixing sticker cost	1 (3,7%)
Average number of prostheses/month	Mean (Standard deviation)
Mean (SD)	9,63 (±19,13)
Prevalence of etiology	
Malignant Pathology	22 (81,5%)
Traumatic	3 (11,1%)
Congenital	1 (3,7%)
Not answered	1 (3,7%)
Benign pathology	0 (0%)
Prevalence of prosthesis confection	
Eyepiece	13 (48,1%)
Obturator	8 (29,6%)
Not answered	2 (7,4%)
Surgical	1 (3,7%)
Headset	1 (3,7%)
Oculo-palpebral	1 (3,7%)
Radiiferous/Protective Prosthesis	1 (3,7%)
Facial	0 (0%)
Nasal	0 (0%)
Average delivery time of prostheses	Mean/Standard Deviation
In weeks	4,3 (±3,15)

The implementation of these services varied from 1934 to 2022. The services comprised dentists, of which 10 had no OMP specialist, 12 had one specialist, 1 had three specialists, another had four specialists, and 1 had five specialists. Two institutions did not inform regarding professional qualifications.

Among the financial support of OPM services, 51.9% were not completely subsidized by the Brazilian Unified Health System, while 40.7% received a full subsidy. The remaining institutions did not provide information on their subsidy status. Considering any possible government assistance or other sponsorship, only 25.9% of these institutions received any form of subsidy, either from the government or another project. A minor percentage, 3.7%, reported occasional subsidies, while 51.9%, did not receive any form of assistance (Table 3).

Approximately 44.4% of the institutions supplied prostheses free of cost, 25.9% charged only the fabrication cost (without profit), 18.5% had a minimal service fee, 3.7% had some cost in sporadic cases, 3.7% charged only the adhesive cost, and 3.7% did not inform.

An average of 9.63 prostheses were fabricated, where the most common etiology was linked to malignant pathologies (81.5%), followed by trauma (11.1%), 3.7% of congenital origin, and 3.7% did not report. The most fabricated prosthesis by the institutions was the ocular (48.1%), followed by the obturator (29.6%), among others. The average delivery time for prostheses was 4.3 weeks, varying according to the institution and prosthesis type (Table 3).

Discussion

The concept of OMP is found in the resolution that regulated the specialty exercise in Brazil in 1993¹². This study conducted a survey involving professionals and services associated with Brazilian OMP. Our results showed a small and regionalized number of specialty dentists in this area; most of these services are established within universities, providing free service to the patient and receiving minimal or no financial incentives.

According to the CFO database, 404.113 active dentists were registered in Brazil at the time of data collection for the present study. The largest concentration of these professionals was in the Southeast region, which also comprised the most OMP specialists¹³. The region with the highest concentration of specialists is also where the two OMP specialization courses are located^{14,15} and, according to our results over half (51.8%) of the Brazilian services are situated within this region.

A specialist degree is not a prerequisite for working with OMP. All dentists can provide care in this specialty, provided they have theoretical and practical knowledge¹⁶. States such as Amapá, Roraima, Tocantins, Bahia, Piauí, Paraíba, Distrito Federal, and Espírito Santo do not have any OMP specialists. Our results showed that in 37% of the services, professionals are not OMP specialists. One possible explanation is that, in the past, only two specialties per dentist could be registered in the CFO. It meant that if the professional had multiple pieces of training, the OMP might not be officiality registered. An alternative reason could be that until 1971, dental prosthesis and OMP were part of a single specialty called Dental Prosthesis, which is valid even today in some countries¹⁷, indicating that many professionals may have received training within this combined context. Our results showed that of the professionals involved in OMP services, 92.6% were trained specialists in some other field; most of them in the specialty of dental prostheses (33.3%).

Dentistry specialties with the lowest number of specialists are OMP followed by Sports Dentistry¹⁰. The small adherence of professionals to the specialty can significantly correlate with low service offerings. An additional potential factor is a minimal exposure to it during graduation. Medeiros et al. conducted a study assessing the inclusion of participants related to OMP in the curricula of Brazilian southeast dental institutions. Their findings revealed that only 5.55% of institutions regularly incorporate OMP as a discipline. Given our results, indicating that this region presented the highest number of specialists and services, the gap in other regions across the country is likely to be even more pronounced since most services within universities serve as a field of activity for students. Public universities stand out in this regard, constituting 62.5% of institutions offering such participants³. This is in accordance with our results, indicating that the public is the primary contributor to the provision of OMP services between universities. Some institutions, such as Minas Gerais, Brasília, and Rio Grande do Sul Federal Universities, São Paulo University, and Rio de Janeiro Pontifical Catholic University, offer extension activities, which allow students to come in contact with the area and offer services to patients¹⁸⁻²².

One of the objectives of the graduation course in dentistry is to comprehend and control the techniques and skills for the diagnosis of oral conditions and complications. This includes intercepting and treating oral diseases, as well as achieving aesthetic-functional restoration and maintaining the balance of the stomatognathic system, according to the Dentistry National Curriculum Guidelines²³. Following these recommendations, OMP content should be covered in dentistry courses. A detailed systematic review of courses' pedagogical projects is desirable for future investigation, to provide an overview of students' contact with the specialty, highlighting that even if there is no discipline with the OMP theme, the participant can be addressed within integrated clinical disciplines.

Representing OMP professionals in Brazil, the respondents majority in this survey were women (74.1%), aligning with the current trend²⁴. However, analyzing the data of professionals specialized in OMP registered in the CFO, 56% were men; such a discrepancy could be because of registrations from active and inactive professionals.

The average age of Brazilian OMP professionals was 54.26 years. In an American study, Sheets et al. demonstrated that the average age of OMP professionals was 55.08 years²⁵. Ariani et al. conducted a survey in 32 countries and demonstrated that the average age of professionals was 46 years¹⁷, showing a trend of more experienced specialists nationally and worldwide.

This study demonstrated that educational institutions were the primary providers of the OMP service. Following universities, professionals with private affiliations, institutes, NGOs, foundations, and hospitals were noted. Most services had students linked to the service, allowing some contact with the specialty. A small number of services were observed throughout Brazil, with the highest concentration in the Southeast region. The main concern was the lack of access to the service in approximately 15 states. This led to large patient displacements and even the impossibility of rehabilitating others.

According to this study, the average production time of OMP was 4.3 weeks, varying according to the type of prosthesis needed and demand for the service. Multiple visits are required during the development of the OMP. However, it is not feasible for many patients to travel multiple times owing to financial, physical, or emotional conditions. They can be embarrassed to expose their deformities to the public, as they are psychologically traumatized and in great distress and have difficulty reintegrating into society, improving significantly after the use of OMP²⁶.

As for the OMP costs of services were studied, most of them were free of charge; however, only 25.9% are entirely free, and the same percentage reported receiving some government subsidy or another sponsor. Other institutions charge the material cost without any profit because they do not obtain any aid. Considering the patients who seek these services, have acquired defects, mainly of malignant etiology, and have a low socioeconomic level, this factor is decisive for treatment execution²⁷.

In this study, the most common etiology that required OMP was malignant pathology. According to the National Cancer Institute, the rate of head and neck cancer is alarming. Approximately 76% of cases are diagnosed in advanced stages, making treatment difficult, increasing morbidity rates, and causing mutilating defects⁸. Another cause for using OMP was trauma, in which the maxillofacial traumas were the most common at polytrauma centers. These injuries have a high morbidity rate and capacity for severe facial deformations⁹.

Most of the services studied produce the most diverse types of OMP. Obturators and eyepieces are the most frequent owing to the number of institutions fabricating them and quantity produced. Intraoral prostheses are used to rehabilitate post-surgical patients after partial or total maxillectomies⁴. They provide significant benefits to the patient. It occludes the oroantral communication after the surgical resection, allowing adequate swallowing, consequently maintaining the nutritional status, in addition to restoring speech, chewing, vertical dimension, and maintaining acceptable aesthetics¹. In addition to having an aesthetic benefit, the prostheses that replace the ocular unit maintain the support and tone of the eyelid muscles and protect the ocular cavity².

The necessity and significant contribution of OMP to patients' lives are undeniable²⁸. Essential measures include the formulation of public policies and increased government financial incentives. Potentially incorporating these rehabilitations within the Dental Specialties Center or implementing the procedures to care for individuals with special needs allows the growth of this specialty within Brazilian Dentistry.

The research may have been limited due to restricted access to OMP professionals in Brazil. The study did not include institutions and professionals that provide the service for profit. A larger sample is suggested for future studies on this topic. Furthermore, no specific class entity represents and promotes this oral specialty in Brazil. The Sociedad Latinoamericana de Rehabilitación Bucomaxillofacial is an organization that connects and organizes congresses of the specialty in South America. This continental institution has great importance in the area.

In conclusion, OMP is still under development in Brazil and the number of professionals is small and regionalized. There is an imperative to establish new, specialized training centers and decentralize the presence of professionals, thus expanding access and enhancing services for oral and maxillofacial prostheses throughout Brazil.

Competing interests

The authors have no conflicts of interests to disclose.

Data availability

Datasets related to this article will be available upon request to the corresponding author.

Author contribution

Daiane Amador Fraga Martins: data collection, draft manuscript preparation. **Adriana Corsetti:** study conception and design. **Natália Batista Daroit:** study conception and design; data collection, draft manuscript preparation. All authors analyzed, interpreted, and reviewed the findings and revised and approved the final version of the manuscript.

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