

RESEARCH NOTE

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# Associated factors of prosthetic rehabilitation in specialized dental care in Brazil: a cross-sectional study

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## Abstract

**Objective** This study aimed to analyze the individual and contextual factors associated with prosthetic rehabilitation in Dental Specialty Centers (DSC) in Brazil. A cross-sectional study, with secondary data from modules II and III of the External Assessment of the 2nd Cycle of the National Program for the Improvement of Access and Quality (PMAQ) of DSCs, was conducted in 2018. Individual variables considered were socioeconomic conditions and perceptions about the structure and service of the DSC. Contextual variables were related to DSC. We considered the region of the country (capital or countryside), geographic location and work process of the DSC for prosthetic rehabilitation. The association between individual and contextual variables and prosthetic rehabilitation in the DSC was analyzed by multilevel logistic regression.

**Results** Ten thousand three hundred ninety-one users from 1,042 DSC participated. Of these, 24.4% used dental prosthesis and 26.0% performed at the DSC. In the final analysis, performed dental prostheses in the DSC individuals with less education (OR= 1.23; CI95%:1.01–1.50) and residents of the same city as the DSC (OR= 1.69; CI95%:1.07–2.66), at a contextual level, DSCs of the countryside (OR= 1.41; CI95%:1.01–1.97) were associated with the outcome. Individual and contextual factors were associated with prosthetic rehabilitation in the DSC.

**Keywords** Dental Prosthesis, Unified Health System, Oral health services, Cross-sectional studies

## Introduction

Oral health conditions are a challenge for public health [1, 2]. Until the year 2017, approximately 3.5 billion people in the world had oral problems, and 267 million were people who had tooth loss [1]. In Brazil, the last epidemiological survey of oral health showed an increase, in

tooth loss with age. The decayed, missing and filled teeth (DMF-T) rate represented 5.8% of the rate among young people, 44.7% among adults and 92% among the elderly [3].

Tooth loss compromises the functionality of the dentition, leading to difficulties in speech and the act of smiling [4, 5] and, consequently, affecting individuals' social and emotional interactions [6].

Thus, prosthetic rehabilitation is necessary since the replacement of teeth lost by prostheses restores chewing, promotes better nutrition, and provides well-being and facial aesthetics, which leads to increased quality of life [7].

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The prosthetic rehabilitation offered by the Unified Health System (SUS) is provided by the National Oral Health Policy (PNSB) through the “Brasil Sorridente” program. The laboratory manufacture of dental prostheses, which include removable mandibular partial dentures, removable maxillary partial dentures, total mandibular dentures, total maxillary dentures, and fixed/adhesive coronary/intra-articular prostheses, are the responsibility of the regional dental prosthesis laboratories (LRPD) or private laboratories hired by the management of the services, as provided for in Ordinance No. 1,825 of 2012. The clinical phase of dental prostheses, including impressions, cementation, adaptation, and guidance to users regarding use, hygiene, and post-use adjustment, is carried out by dentists working in Primary Health Care (PHC) or by prosthetics from the Dental Specialty Centers (DSC).

The DSCs were created to increase the population's access to specialized procedures, continuing the care initiated by the PHC according to referral protocols established by the services [8, 9]. Despite efforts to resolve a greater supply of prostheses in the SUS, in 2014, approximately 22,653 complete dentures and 10,070 removable partial dentures were delivered per month in the country [10], an insufficient number to meet the dental prosthesis needs of the 9,501,160 Brazilians aged between 65 and 74 years.

Furthermore, the uneven distribution of public oral health facilities stands out [10]. Of the 780 DSCs in the Brazilian regions in 2014, 325 had established working processes with the LRPD. Considering the proportion of capitals with DSCs, the North and Northeast regions were the least favored [10]. Thus, in addition to the limited and uneven supply of dental prostheses in DSCs, other organizational and individual factors of SUS users may affect access to rehabilitation treatment [11]. Thus, it is necessary to investigate the factors that permeate the prosthetic rehabilitation of users in specialized dental services to collaborate with the work process at this level of oral health care.

This study aimed to analyze the individual and contextual factors associated with prosthetic rehabilitation in Dental Specialty Centers in Brazil.

## Main text

### Methods

This is a cross-sectional study with data extracted from the database on the second cycle of External Evaluation of the National Program for Improving Access and Quality of Dental Specialty Centers (PMAQ-CEO – in Portuguese), available on the website of the Secretary of Primary Health Care, from the Ministry of Health (<https://aps.saude.gov.br/ape/pmaq/ciclo2ceo/>).

The second cycle of the PMAQ-CEO was carried out in Brazil in 2018 and presented three stages of development. The last was the on-site verification of the quality standards established by the program (external evaluation). In this stage, a trained external evaluator, independent of the service, applied a questionnaire divided into three modules. Module I related to evaluating the structure, equipment, instruments, and supplies of the facility. Module II, which included data related to the work process, the organization of the service and the care of the users, was answered by the managers of the DSC and a dentist of any specialty. Module III, designed to collect data on user satisfaction and perceptions of specialized oral health services regarding access and use, was administered to users at the DSC. Detailed information about the program is available in the PMAQ-CEO 2nd Cycle Instruction Manual [12].

The present study extracted data from modules II and III of the PMAQ-CEO. The spreadsheets exported to the Microsoft Office Excel 2010 program were merged using the National Registry of Establishment number as a common identifier, as reported in a previous study [13]. In this way, linking the data provided by the DSC's managers and dentist to the users' data was possible.

The sample of users participating in the external evaluation of the 2nd Cycle of the PMAQ-CEO was of convenience. As inclusion criteria, only users aged 18 and over were considered for the interview. Those present for the first time in the DSC were excluded, as provided in the Ministry of Health's PMAQ-CEO external evaluation manual. Each field evaluator was trained to apply the instrument to 10 users aged 18 and over who were present at the DSC on the day of the external evaluation [12].

The dependent variable was extracted from module III, based on the following question: “Where did you get your dental prosthesis?”. The response options were operationalized for analysis purposes in: “In the DSC (in this or another)” or “Other” (Primary Health Unit, Private Clinic or Private Practice, Other).

The independent contextual variables were the region of the country (including all regions considered) and the location of the DSC (urban or rural). In addition to the questions from module II, namely: referral for prosthodontics impressions at the DSC (yes/no), waiting list management (yes/no) and presence of predefined places for referral of primary care users to clinical prosthodontist (yes/no/no service in this specialty), estimated waiting time for the user to be seen by the clinical prosthodontist at the DSC (dichotomized in:  $\leq 2$  months,  $> 2$  months, no information), number of people in the queue waiting to be seen for a prosthesis (dichotomized by the median into  $\leq 123$ ,  $> 123$  days and no information), suspension of DSC care in the past 12 months due to lack of supplies or instruments (yes/no), average number of

dentures delivered per month (dichotomized into:  $\leq 25$  or  $> 25$ ).

Questions from module III were also considered as individual independent variables related to sociodemographic aspects, such as sex (male/female), age (categorized as  $< 44$  years old, from 45 to 64 years old or  $\geq 65$  years old), self-reported ethnicity/skin-color (yellow/indigenous, white, brown, black) marital status (single, married, divorced/widowed), retirement (yes/no), family income ( $\leq 1$  minimum wage,  $> 1$  minimum wage), family allowance benefits (yes/no), level of education (up to complete secondary education/at least complete secondary education).

In addition, it was considered whether the respondent lived in the same municipality as the DSC (yes/no), whether the home was covered/accompanied by the Family Health Strategy (yes/no), the mean time to reach the DSC (dichotomized by the mean  $\leq 20$  min and  $> 20$  min), whether the opening hours met the needs (yes/no), reception when looking for the DSC (very nice, good, fair or poor, very fair), good conditions of use of the facilities of the DSC (yes/no), the general opinion of the service received from the DSC (very nice, good, fair or poor, very fair). The sample size was determined by the PMAQ-CEO Coordination in accordance with the program manuals.

Initially, frequency distribution tables were built. Then, analyses of the associations between prosthesis performance in a DSC with individual and contextual variables were performed. For this, simple and multiple multilevel logistic regression models were used. First, multilevel models were performed to consider possible dependencies between the observations of patients from the same DSC. The variables of the first level (individual) and the second level (contextual/DSC) were then considered in the model. Finally, using the empty model, using only the intercept, it was possible to calculate the intraclass correlation coefficient, estimating the proportion of the total variance due to the context (DSC).

In the multiple models, we selected the variables that presented  $p < 0.20$  in the crude analyses. Next, the first-level variables were included in the model, remaining with  $p \leq 0.05$  after adjustments for the first-level variables. After the second-level variables were included, those with  $p \leq 0.05$  remained in the final model after adjustments for the other variables. Finally, the crude Odds Ratio (OR) were calculated and adjusted to 95% confidence intervals (95%CI). The QIC evaluated the fit of the models. The analyzes were performed using the R and Statistical Analysis System (SAS) programs.

The study was approved by the Research Ethics Council under protocol 23458213.0.1001.5208, following resolution 466/2012 of the National Health Council. All

participants received and signed the Free and Informed Consent Term in two signed copies.

## Results

Of the 10,391 respondents, out of 1,042 DSCs in the country, 24.4% (95%CI: 23.6%; 25.2%) used dental prostheses. Of individuals who reported using dental prostheses, 26.0% performed in a DSC and the rest in another location.

Tables 1 and 2 present the frequency distributions of patients who used dental prostheses according to the independent variables. Most of the sample was female (68.3%), aged between 45 and 64 years (57.0%), married (54.1%), not retired (65.1%), with a family income of up to one minimum wage (55.6%) and a level of education up to incomplete high school (67.2%). In addition, 93.2% live in the municipality of DSC, with Family Health Strategy (FHS) coverage (81.9%). It was observed that 97.2% and 97.1% found the reception and service provided by the DSC to be good, respectively, but for 96.7%, the DSC's opening hours do not meet their needs. It was also possible to identify that the majority were patients of DSCs from the countryside (85.0%), with 72.0% patients of DSCs who perform dental prosthesis impressions and 75.0% of DSCs who manage the waiting list.

When the variables were adjusted (final model), it was observed that the prevalence of patients who had their prosthesis performed in a DSC was significantly higher among those with a lower level of education [OR=1.23 (95%CI 1.01;1.50)], who live in the municipality where the DSC is located [OR=1.69 (95%CI 1.07;2.66)] and among those patients with DSC in the countryside [OR=1.41 (95%CI 1.01;1.97)] (Table 3).

## Discussion

The present study evaluated the individual and contextual factors associated with prosthetic rehabilitation in DSC in Brazil. Still, it identified that the prevalence of users who had dental prostheses produced by the DCS is low. At an individual level, users with a lower level of education and who lived in the same city where the DSC is located, and at a contextual level, those who accessed the DSC in the countryside were more likely to have their prosthetic needs met.

There are financial, geographic and organizational barriers that compromise users' access to the services offered by the DSC [14]. However, few investigations explore access to prosthetic rehabilitation promoted by this service. When it comes to barriers to accessing dental prostheses in the DSC, the findings revealed that people with a lower level of education were more likely to have a prosthesis in the DSC, a finding also verified in the literature [15]. Although this seems optimistic, this data may reflect attention that only comes to individuals

**Table 1** Frequency distribution of sample patients as a function of individual variables, PMAQ-CEO, Brazil, 2018

Variables	n (%) <sup>a</sup> (n = 2.706)	n (%) <sup>b</sup> of patients that made prosthesis in DSC (n = 703)
<b>The place where the prosthesis was made.</b>		
DSC (or other)	703 (26.0)	-
Other places	2,003 (74.0)	-
<b>Gender</b>		
Male	857 (31.7)	210 (29.7)
Female	1,849 (68.3)	493 (70.3)
<b>Age (years)<sup>c</sup></b>		
≤ 44	568 (21.0)	117 (16.7)
45 a 64	1,542 (57.0)	396 (56.6)
≥ 65	586 (22.0)	187 (26.7)
<b>Color/race</b>		
Indigenous/Yellow	127 (4.7)	33 (4.7)
White	1,023 (37.8)	265 (37.7)
Brown	1,236 (45.7)	322 (45.8)
Black	320 (11.8)	83 (11.8)
<b>Marital status</b>		
Single	608 (22.5)	132 (18.8)
married	1,463 (54.1)	393 (55.9)
Divorced/Widower	635 (23.4)	178 (25.3)
<b>Retired</b>		
Yes	945 (34.9)	289 (41.1)
No	1,761 (65.1)	414 (58.9)
<b>Family Income (minimum wage)</b>		
≤ 1	1,504 (55.6)	389 (55.3)
> 1	1,202 (44.4)	314 (44.7)
<b>Participates in the "Bolsa Família" Program<sup>c</sup></b>		
yes	485 (18.0)	117 (16.7)
No	2,198 (82.0)	583 (83.3)
<b>Education</b>		
Up to high school, incomplete.	1,817 (67.2)	508 (72.3)
High school complete	889 (32.8)	195 (27.7)
<b>Living in the municipality</b>		
yes	2,522 (93.2)	669 (95.2)
No	184 (6.8)	34 (4.8)
<b>Housing Location</b>		
Urban	2,297 (85.4)	593 (85.0)
Rural	394 (14.6)	105 (15.0)
<b>FHS Coverage<sup>c</sup></b>		
Yes	2,216 (83.6)	593 (86.1)
No	436 (16.4)	96 (13.9)
<b>Time until the DSC</b>		
Up to 20 min	1,637 (60.5)	422 (60.0)
More than 20 min	1,069 (39.5)	281 (40.0)
<b>Hours of operation meet the needs</b>		
Yes	89 (3.3)	22 (3.1)
No	2,617 (96.7)	681 (96.9)
<b>Welcoming</b>		
Good	2,630 (97.2)	685 (97.4)
Bad	13 (0.5)	4 (0.6)
Fair / Don't know / Did not answer /	63 (2.3)	14 (2.0)

**Table 1 (continued)**

Variables	n (%) <sup>a</sup> (n = 2.706)	n (%) <sup>b</sup> of patients that made prosthesis in DSC (n = 703)
<b>DSC in good conditions</b>		
Yes	2,331 (86.1)	603 (85.8)
No	375 (13.9)	100 (14.2)
<b>DSC service</b>		
Good	2,628 (97.1)	687 (97.7)
Bad	7 (0.3)	2 (0.3)
Fair / Don't know / Did not answer /	71 (2.6)	14 (2.0)

National Program for Improving Access and Quality of Dental Specialty Centers (PMAQ-CEO)

<sup>a</sup> Prevalence in the column<sup>b</sup> Percent of patients in each category who underwent the prosthesis in a DSC.<sup>c</sup> Absolute frequency totals differ due to missing data (blank or ignored data)**Table 2** Frequency distribution of sample users according to contextual variables, PMAQ-CEO, Brazil, 2018

Variables	Users n (%)	n (%) <sup>b</sup> of patients that made prosthesis in DSC (n = 703)
<b>Region</b>		
Midwest	182 (9.6)	49 (7.0)
North	87 (4.6)	37 (5.3)
Northeast	715 (37.7)	265 (37.7)
South	221 (11.7)	86 (12.2)
Southeast	690 (36.4)	266 (37.8)
<b>DSC Location</b>		
Capital	406 (15.0)	82 (11.7)
Countryside	2,300 (85.0)	621 (88.3)
<b>Makes molding</b>		
Yes	1,949 (72.0)	639 (90.9)
No	757 (28.0)	64 (9.1)
<b>Manages waiting lists</b>		
Yes	2,030 (75.0)	548 (78.0)
No	676 (25.0)	155 (22.0)
<b>There are predefined quotas</b>		
Yes	621 (23.0)	206 (29.3)
No	1,370 (50.6)	433 (61.6)
There is no service in this specialty	715 (26.4)	64 (9.1)
<b>Waiting time for service at the DSC<sup>c</sup></b>		
≤ 2 months	1,259 (57.9)	369 (56.2)
> 2 months	915 (42.1)	287 (43.8)
<b>Number of people on the waiting list</b>		
≤ 123 <sup>d</sup>	744 (46.7)	265 (49.2)
> 123	850 (53.3)	274 (50.8)
<b>Suspended services due to lack of Supplies / instruments</b>		
Yes	589 (21.8)	141 (20.1)
No	2,117 (78.2)	562 (79.9)
<b>Average delivery of the prosthesis a month</b>		
≤ 25	820 (30.3)	212 (30.2)
> 25	1,885 (69.7)	491 (69.8)

National Program for Improving Access and Quality of Dental Specialty Centers (PMAQ-CEO) <sup>a</sup>Prevalence in the column; <sup>b</sup>Prevalence of patients in each category who underwent prosthesis in a DSC. <sup>c</sup>Absolute frequency totals differ due to missing data (blank or ignored data). <sup>d</sup>Median of the sample

**Table 3** Crude and adjusted analysis between “having had the prosthesis done at a DSC” according to contextual and individual variables, PMAQ-CEO, Brazil, 2018. (n = 2706)

Variables	OR (CI95%) <sup>a</sup>	p-value <sup>b</sup>	OR adjusted (CI95%) <sup>a</sup>	p-value <sup>b</sup>
<b>Contextual level (DSC)</b>				
Macro region CO (Ref=No )	1.00 (0.52;1.91)	0.993		
Macro region NE (Ref=No )	1.09 (0.61;1.94)	0.770		
Macro region S (Ref=No )	1.04 (0.55;1.98)	0.896		
Macro region SE (Ref=No )	1.26 (0.71;2.25)	0.433		
Place of DSC (Ref=Capital )	1.46 (1.04;2.05)	0.028	1.41 (1.01;1.97)	0.041
Make impressions (Ref=No)	1.66 (3.74;7.45)	<0.001		
Management waiting list (Ref=No)	1.24 (0.98;1.62)	0.106		
Predefined places (Ref=No)	1.07 (0.84;1.38)	0.573		
Time of waiting (Ref> 2 months )	0.91 (0.72;1.14)	0.403		
People on the waiting list (Ref> 123 )	1.16 (0.90;1.49)	0.236		
Suspended calls (Ref=Yes )	1.15 (0.88;1.51)	0.317		
Number of prostheses per month (Ref ≤ 25 )	1.01 (0.79;1.29)	0.935		
<b>Individual level</b>				
Sex (Ref=Male)	1.12 (0.93;1.35)	0.240		
Age 45 to 64 years (Ref ≤ 44)	1.33 (1.03;1.72)	0.027		
Age ≥ 65 years (Ref ≤ 44)	1.81 (1.34;2.43)	<0.001		
Race/color (Ref=White)	1.00 (0.74;1.35)	0.990		
Race/color Brown (Ref=White)	1.00 (0.82;1.23)	0.941		
Marital marriage (Ref=Single)	1.32 (1.05;1.68)	0.019		
Marital widower (Ref=Single)	1.40 (1.08;1.82)	0.010		
Retired (Ref=No)	1.43 (1.20;1.72)	<0.001		
Family income (Ref> 1 MW)	0.99 (0.81;1.20)	0.893		
“Bolsa família” (Ref=No)	0.88 (0.70;1.11)	0.291		
Education (Ref ≥ High School )	1.38 (1.14;1.68)	0.001	1.23 (1.01;1.50)	0.041
Live in the city (Ref=No)	1.59 (1.04;2.45)	0.034	1.69 (1.07;2.66)	0.024
Place of residence (Ref=Urban)	1.04 (0.82;1.33)	0.729		
Coverage by FHS (Ref=No)	1.29 (1.01;1.66)	0.042		
Time to DSC (Ref> 20 min )	0.97 (0.81;1.17)	0.774		
Opening hour met the needs (Ref=No )	0.93 (0.56;1.55)	0.789		
Welcoming (Ref=Bad )	0.79 (0.22;2.89)	0.724		
Installations in good condition (Ref=No)	0.96 (0.74;1.25)	0.761		
DSC service (Ref=Bad )	0.88 (0.16;5.00)	0.8899		

National Program for Improving Access and Quality of Dental Specialty Centers (PMAQ-CEO). <sup>a</sup>OR: Crude Odds Ratio. P-value: obtained by the multilevel logistic regression analysis. The variance between DSC=0.1390; Residual variance=0.8673; Quasi-likelihood under the Independence model Criterion (empty model)=2407.42

dependent on the SUS, in which the wait and realization occur only because they do not have another viable option for its execution. Thus, reducing the waiting list, in addition to making the service more resolute, can minimize the problems inherent to a population that, when not attended, has no other way of performing the dental prosthesis.

Obtaining a dental prosthesis was higher among users who lived in the same municipality as the DSC. Therefore, despite all efforts to facilitate the process of regionalization of services in an inter-municipal way, through referrals to specialties through the Consortium Agreed Programming (PPC) among the consortium entities, [16] still end up privileging the reference municipality. In the PPC, the state and the countryside of a specific health region financially agree to maintain the DSC and

its operation according to the existing human resources, establishing the number of vacancies for the countryside and state that compose it [17]. In general, services use the Regulation System (SISREG) to manage referrals between Primary Health Care and the Regional Reference Center for Dental Specialty [18, 19].

However, in the first external evaluation of the PMAQ-CEO, carried out in 2014, it was observed that of the 876 DSCs distributed in Brazil, only 358 (38.5%) had clinical protocols for referring users of primary health care to the dental prosthesis specialty, [20] which also demonstrates a low agreement for specialized dental prosthesis services in Brazil. It can also be understood that the larger population size of the municipality of reference for regional health makes the citizens of these municipalities more likely to be served in these establishments. Therefore, the



relationship between user access and decentralization and regionalization of dental care services at a secondary level has not been established [18]. This seems to depend on the distribution characteristics of the DSC, its coverage areas, transport logistics, protocols and work practices, and the demand profile for specialized care. It is suggested that other studies explore this theme, considering the specialty of dental prostheses. After all, strengthening the regionalization of services makes it possible to take specialized, more expensive technologies to the population of the municipalities associated with a region, optimizing resources and expanding the guarantee of oral health care [21].

It was also observed that users living in rural areas were more likely to solve their prosthetic problems at the DSC than users living in urban areas of the capital. In general, the literature reports difficulties for the prosthodontist service to achieve good productivity [9, 22, 23]. Some specialties offered by the DSC have better performance in terms of targets for procedures, which may be related to the sociodemographic conditions of the communities, such as the Human Development Index, gross domestic product, illiteracy rate, poverty and FHS coverage [24].

Although one study showed non-compliance with oral surgery targets was associated with the larger population size of the cities studied, [25] no studies with this evaluation were found for the prosthodontic specialty.

Finally, it is worth clarifying that the PNSB established prosthetic rehabilitation in the SUS in 2004. Through this policy, the Dental Prosthesis Laboratories (LRPD) were structured. However, by 2013, 1,465 LRPD were qualified, unequally distributed in the country, without considering epidemiological indicators and the population's prosthetic needs, with production below meeting the population's demands - rates of 15.81 total dentures delivered per month per 100,000 inhabitants [26]. The low productivity and distribution of LRPD can affect the offers of the prosthesis specialty at the DSC, since these laboratories collaborate with the manufacture of prostheses requested both by the oral health teams of primary care and mobile dental teams units (UOM) and DSC.

According to the Department of Health's Strategic Management Support Room, 2,524,403 dentures were provided in secondary care between 2010 and 2015. Although many dentures have been delivered over the years, there is a deficit in access to prosthetic rehabilitation at this level of care. In this sense, the pace of expansion of services has not kept pace with the demand for services. It is noteworthy that the specialty of prosthetics is not included in the list of minimum specialties available to the DSC, and its inclusion may be a local management decision.

The expansion of access to dental prostheses in the SUS has been discussed, [28] including encouraging the

provision of dental prostheses in PHC. However, the analysis of the performance of 18,114 oral health teams inserted in the PHC in 2014 revealed that less than half of them (43%) delivered some type of dental prosthesis [29]. Comparing the performance of the oral health teams in PHC, between the years 2011/2012 and 2013/2014, there was a 0.8% increase in taking impressions for prostheses, indicating a low number of teams in PHC that perform the procedures for the prosthetic rehabilitation of users [30].

It is also essential to consider that the manufacture of dental prostheses is recommended through several stages and requires inputs, material resources, and technical skills from the dentist [27]. Characteristics of the dental practices included in the DSC, and the structure of these establishments, need to be considered. It is expected that the largest number of deliveries of prostheses to the SUS user population is through this service, which is a hypothesis to be tested for better readjustment and reallocation of resources considering all access points of the oral health care network.

## Conclusion

Individual factors such as education level and living in the same municipality as the DSC, and contextual factors such as accessing a DSC located in the countryside, are associated with prosthetic rehabilitation in the specialized dental care of the SUS.

## Limitation

As a limitation, it is emphasized that the design of the PMAQ-CEO data collection considered the approach only to users present in the establishment, as informants by free adhesion, thus veiling the data and the perception of users not present. Thus, the convenience sample may not characterize the entire population assisted by dental specialties, so we cannot generalize our findings to the country.

## List of Abbreviations

DSC	Dental Specialty Centers
PMAQ	National Program for the Improvement of Access and Quality
DMF-T	Missing and filled teeth
SUS	Unified Health System
PNSB	National Oral Health Policy
LRPD	Dental prosthesis laboratories
PHC	Primary Health Care
SISREG	Regulation System

## Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s13104-023-06318-x>.

Supplementary Material 1

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Not applicable.

## Author Contribution

Cunha IP, Lacerda VR, and Bomfim RA participated in the conception, design, and data collection. Cunha IP and Silva Junior MF participated in the article writing. Cunha IP, and Bomfim RA participated in the critical review. All Authors read and approved the manuscript.

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## Data Availability

Datasets related to this article can be found on the Ministry of Health website hosted at <https://aps.saude.gov.br/ape/pmaq/ciclo2ceo/>.

## Declarations

### Ethics approval and consent to participate

The Research Ethics Council approved the National Program for Improving Access and Quality of Dental Specialties Centers of the Federal University of Pernambuco (Registration 23458213.0.1001.5208) following the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. In addition, all participants received and signed the Informed Consent Form in two copies.

### Consent for publication

Not applicable.

### Competing interests

The authors declare that they do not have any conflict of interest.

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