

Evaluation of Secondary Dental Health Care at the Dental Specialties Center, Pelotas, Rio Grande do Sul, Brazil, 2012-2013.

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Mariane Baltassare Laroque

Prefeitura Municipal, Secretaria Municipal de Saúde, Pelotas-RS, Brasil

Ana Claudia Gastal Fassa

Universidade Federal de Pelotas, Departamento de Medicina Social, Pelotas-RS, Brasil

Eduardo Dickie de Castilhos

Universidade Federal de Pelotas, Departamento de Odontologia Preventiva e Social, Pelotas-RS, Brasil

Abstract

Objective: to evaluate the structure, care process and results of the endodontics, periodontics and surgery services at the Pelotas/RS Dental Specialties Centre (DSC). **Methods:** this was a cross-sectional study; an evaluation was made of the number of dental professionals and teams at the DSC, forms of referral and appointment making and no-show management; demand for services and referral to the appointment control centre between July 2012 and June 2013 were characterized. **Results:** 940 service users received care and 1,502 procedures were performed; 76.0% of procedures were concluded; average waiting time was 2 months; 13% of service users referred did not complete treatment and 849 were on the waiting list. **Conclusion:** DSC did not meet Ministry of Health required productivity parameters and needs to increase production; the appointment control centre needs protocols to guide care prioritization; moreover, the municipality needs additional DSCs.

Key words: Specialties, Dental; Secondary Care; Health Evaluation; Dental Health Services; Health Services Accessibility.

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Correspondence:

Mariane Baltassare Laroque – Rua Villa do Conde, nº 401, Recanto de Portugal, Pelotas-RS, Brasil. CEP: 96083-360. E-mail: maryblaroque@hotmail.com

Introduction

The Dental Care Policy – Smiley Brazil –, created in 2003, increased the possibility of an improvement in dental healthcare. This Policy tries to change the prevalent mutilating characteristics in dental health, by guaranteeing the system's integrality.¹ In this context, the Dental Specialties Centers (DSC) can expand the coverage of medium complexity procedures in public dental health services, complementing the basic healthcare attention and improving the population health conditions.²

From 2004 to 2014, 1,000 DSCs were implemented in Brazil, distributed in 739 municipalities, with higher concentration in states capitals. In 2014, Rio Grande do Sul State had 23 DSCs.³ Although it is known that this number of centers is not enough to meet the population needs, there is no estimative of deficit in the offer of this service in the state.

The Dental Specialties Centers (DSC) can expand the coverage of medium complexity procedures in public dental health services, complementing the basic healthcare attention and improving the population health conditions.

A study conducted in Pernambuco State, in 2009, showed that only 40.9% of the DSCs met the Ministry of Health parameters for outpatient care production, while 31.8% had a bad performance in accomplishing the targets.⁴ These results may be due to bad services provided or inadequacy of the proposed targets. During the literature review, few studies on evaluation secondary dental health care.^{1-2,4-10}

This study aims to evaluate the structure, care processes and results of endodontics, periodontics and surgery services by the DSC Jequitibá, in the municipality of Pelotas, Rio Grande do Sul State (RS), Brazil, also analyzing the waiting time for the services. We expect this article to contribute in subsidizing the specialized services in dental and policies that maximize the use of offered services.

Methods

A cross-sectional study was conducted to investigate the results presented in the DSC Jequitibá, from Pelotas-

RS, as well as the types of demands in this service, including information about the referral service. The data collection took place from July 2012 to June 2013. The DSC structure was evaluated based on the current legislation and on the healthcare process to the users of this specialized service.

According to the demographic census of 2010, Pelotas-RS had a population of 328,275 inhabitants, and 93.27% lived in urban areas. The municipal human development index (HDI) was 0.739 in 2010, and the socioeconomic development index was 0.770 in 2009.

In July 2014, Pelotas was under the Health Service Management and had 51 primary health care units (PHU), from which 12 were located in the rural area and 26 belonged to the Family Health Strategy (FHS), covering 45% of the population. There were 47 dental offices in PHUs, municipal schools and in the Pelotas-RS regional prison, with 64 dental surgeons (DS), 17 dental health assistants (DHA) and 17 dental health teams (DHT) working in these offices.

The DCS Jequitibá from Pelotas-RS was founded in a partnership with the Dental School of the Federal University of Pelotas (UFPel). It is a type I DSC and was authorized by the Ordinance No. 559, dated 29 March 2012. The minimum goal for outpatient care production in this DSC is: 80 basic procedures conducted in special patients (preventive individual procedures, basic dentistry, and basic dental surgery); 60 periodontics procedures; 35 endodontics; and 80 oral surgeries (surgical dentistry, oral and maxillofacial traumatology).¹¹ Jequitibá center is the only DSC in Pelotas-RS and is a reference for moderate complexity procedures in public dental healthcare in that municipality.

To evaluate its structure, the center was visited and, with a semi-structured guide the following indicators for each specialty were observed: human resources (number of professionals/researchers working there; number of week shifts available); services offer (number of week hours dedicated; number of offered services); and equipment (number of available dental chairs per week).

To evaluate DSC process, the following aspects were analyzed: number of users per specialty; number of waiting days for treatment per specialty; and number of scheduled users who do not start the treatment there. For this evaluation, the authors used the DSC registry system and the referral forms received by the municipal dental regulation center.

This study is a census of all the dental care performed in the period.

The DSC results characterization was based on: proportion of users who concluded their specialized treatment (number of users who began and finished the treatment at the DSC); necessary average time to conclude the treatment, according to specialty (necessary number of days to finish the treatment); and number of procedures conducted for each specialty. This information was related to achieving or not the parameters established by the Ministry of Health.

To calculate the average procedures performed per user, for each specialty, we took into consideration the total procedures divided by the number of users referred to the DSC in the studied period.

Three of the five specialties offered by the DSC were evaluated: periodontics, endodontics and minor oral surgery. Basic procedures performed in special patients and dental diagnostic procedures were not accounted because the DSC and Dental School users are treated together, making difficult to find the specific DSC demand.

The DSC receives individuals who went first to the PHU and were referred to specialized services. In the specialties of surgery, periodontics and endodontics of single-rooted and two-rooted teeth, the DSC treated the population from all the PHUs that have a dentist in Pelotas-RS primary health services, totalizing 297,189 people. For molar endodontics specialty, the DSC treated the population of the 14 PHUs with Dental Health Teams (DHT) and internships of 10th semester students from the Dental School/UFPEL, totalizing 93,041 people.

The DSC demand was characterized according to the following variables: sex (male; female); age (in complete years: 10 to 19; 20 to 29; 30 to 39; 40 to 49; 50 to 59; 60 or older); school level (no schooling; elementary school; high school; higher education; post-graduation); PHU of origin; specialty (endodontics; surgery; periodontics); reason for referral (type of treatment); and counter-reference (conducted or not). This information was collected in the DSC registry table, except for the education level, collected from the medical records.

In the referral files, data such as name, age, sex, DSC of origin, reason and referral date to the DSC of the users who were in the waiting list for the specialized treatment were collected. The data collection day was also recorded.

This study is based on the Donabedian model. It proposes the analysis of the structure, the care process and the outcomes as standard analysis categories to

evaluate quality of health care. In this study, however, we considered as intermediate outcomes what Donabedian described as process. The structure includes resources or devices used in healthcare. The healthcare process involves the activities or procedures applied by the health professionals to transform the resources in outcomes, and these outcomes are represented by the answers or changes noticed in the users.¹²

The analyses were composed by absolute and relative frequencies of the variables, and were performed in the program Stata 12.0, as well as the average, median, and continuous variables measure.

This is an operational study, based on secondary data, so it does not imply in any risk for the individuals who provided the information. The structure analysis was performed by using semi-structured guides, because there were no registries for consulting. Due to the services characteristics, the Term of Consent was not adopted. To attend the National Health Council resolution No. 466, dated December 12, 2012, this study was approved by the Research Ethics Committee of the Medical School of the Federal University of Pelotas (UFPEL) through the decree No. 630,526. The Dental School/UFPEL and the Municipal Secretariat of Health have authorized the use of service data.

Results

Due to the fact that this is a university DSC, the structure available for the treatments may vary, depending on the subject that will be using the clinics of the Dental School. In June 2014, 28 dental teams were available for the DSC, divided into their specialties. There was 1 dental chair for molar endodontics, 12 for endodontics of single/two-rooted teeth, 9 for periodontics and 6 surgery boxes.

The DSC offered a total of 164 hours in these three specialties every week. Endodontics fulfilled 104 hours per week: 8 hours for molar endodontics and 96 hours for endodontics of one/two-rooted teeth. Periodontics was offered for 36 hours per week, and the surgery for 24 hours/week for treating DSC users. In the other shifts this structure was used by other subjects of the Dental School.

The referral to the DSC usually occurred after medical care in a Primary Health Care Unit (PHU), and the appointment was done by the dental regulation center. The users' appointments were scheduled 7 days before, on average. The regulation center was responsible only

for the first appointment schedule. The reschedule took place in the DSC.

In June 2014, according to information of the dental regulation center, there were 849 users in the waiting list for specialized treatment. Most of the users in the waiting list – 334 – were waiting for surgery; and 252 people were waiting for periodontics. For single/two-rooted teeth there were 242 people waiting and for molar endodontics, 21. It is important to highlight that in the first six months after the DSC opening, only 14 PHUs could refer users to molar endodontics, and, after this period, this specialty referrals were suspended.

We observed that, of 515 users referred from January to June 2013, 95 did not show up, resulting in a no-show rate of 18.0% in this period. One strategy adopted to reduce idleness due to those absences was to schedule extra users, reaching almost the double of users related to the service offer.

The specialty with the highest waiting time for treatment was molar endodontics: 170 days, on average, for this specialty first appointment in the DSC. The other specialties presented similar waiting times (around 70 days). The average time to conclude the treatments depended on the specialty. In general the appointments were weekly, and it was necessary around 4 appointments to conclude the treatment for endodontics, 8 for periodontics and 5 for surgery (Table 1). Considering all the specialties, around 75% of the users finished their treatments. The lack of referral to molar endodontics and the lack of adequate means in periodontics and surgery are the main reasons for not concluding the treatment (Table 2).

The average referral to DSC varied according to the timetable and the attention type: the PHUs with DHT referred more users than the PHUs with the traditional dentistry model (Table 3).

940 users were referred to the DSC Jequitibá, of

Table 1 – Waiting time (in days) for appointments and treatment conclusion, according to specialties, of users of the Dental Specialties Center – DSC – Jequitibá (n=940), municipality of Pelotas, Rio Grande do Sul State, Brazil, June 2012 to July 2013

| Specialty | Average | Median | Maximum | Minimum |
|--------------------------------------|---------|--------|---------|---------|
| Waiting time for treatment | | | | |
| Single/Two-rooted endodontics | 76.3 | 85 | 340 | 3 |
| Molar endodontics | 170.6 | 178 | 363 | 7 |
| Periodontics | 63.8 | 34 | 322 | 5 |
| Surgery | 71.3 | 62 | 273 | 2 |
| Time for treatment conclusion | | | | |
| Single/Two-rooted endodontics | 25.8 | 21 | 128 | 2 |
| Molar endodontics | 27.9 | 17 | 152 | 5 |
| Periodontics | 62.3 | 35 | 366 | 1 |
| Surgery | 35.8 | 26 | 206 | 1 |

Table 2 – Characteristics of demands of the Dental Specialties Center – DSC – Jequitibá among users, municipality of Pelotas, Rio Grande do Sul State, Brazil, June 2012 to July 2013

| Specialty | Concluded treatment | | Not referred to DSC ^a | | Lack of adequacy of oral cavity | | Give up treatment | | Lack of medical report ^b | | No information | |
|-------------------------------|---------------------|-------------|----------------------------------|------------|---------------------------------|------------|-------------------|-------------|-------------------------------------|------------|----------------|------------|
| | N | % | N | % | N | % | N | % | N | % | N | % |
| Single/Two-rooted endodontics | 281.0 | 79.2 | 29.0 | 8.2 | 2.0 | 0.6 | 39.0 | 11.0 | – | – | 4.0 | 1.1 |
| Molar endodontics | 61.0 | 75.3 | 10.0 | 12.3 | – | – | 8.0 | 9.9 | – | – | 2.0 | 2.5 |
| Periodontics | 162.0 | 69.5 | 3.0 | 1.3 | 17.0 | 7.3 | 37.0 | 15.9 | 8.0 | 3.4 | 6.0 | 2.6 |
| Surgery | 207.0 | 76.4 | 3.0 | 1.1 | 17.0 | 6.3 | 38.0 | 14.0 | 2.0 | 0.7 | 4.0 | 1.5 |
| Total | 711.0 | 75.6 | 45.0 | 4.8 | 36.0 | 3.8 | 122.0 | 13.0 | 10.0 | 1.1 | 16.0 | 1.7 |

a) Users who were not referred to specialized treatment because they needed primary treatment or because received treatment on other places.

b) Users who needed medical report, with evaluation of their systemic condition to receive the specialized dental procedure.

Table 3 – Average number of referrals (n=43) according to the dental care type of organization in the PHU^a in one year of the Dental Specialty Center – Jequitibá, municipality of Pelotas, Rio Grande do Sul State, Brazil, June 2012 to July 2013

| PHU ^a | Number of PSH ^a | Referrals performed | | | |
|------------------|----------------------------|---------------------|--------|---------|---------|
| | | Average | Median | Maximum | Minimum |
| 20h | 24 | 13.9 | 4.0 | 103.0 | – |
| 40h | 12 | 29.6 | 24.0 | 97.0 | – |
| DHT ^b | 7 | 32.6 | 32.0 | 63.0 | 12.0 |

a) PHU: primary healthcare unit

b) ESB: dental health team

Table 4 – Sociodemographic characteristics of the population treated in the Dental Specialty Center – DSC – Jequitibá, municipality of Pelotas, Rio Grande do Sul State, Brazil, June 2012 to July 2013

| Variable/category | Single/Two-rooted endodontics ^a | | Molar endodontics | | Periodontics | | Surgery | |
|------------------------|--|--------------|-------------------|--------------|--------------|--------------|------------|--------------|
| | Nº | % | Nº | % | Nº | % | Nº | % |
| Sex | | | | | | | | |
| Female | 255 | 73.1 | 38 | 48.7 | 175 | 71.7 | 186 | 69.1 |
| Male | 94 | 26.9 | 40 | 51.3 | 69 | 28.3 | 83 | 30.9 |
| Age (in years) | | | | | | | | |
| 10-19 | 38 | 10.9 | 26 | 33.3 | 22 | 9.0 | 43 | 16.0 |
| 20-29 | 63 | 18.0 | 19 | 24.4 | 24 | 9.8 | 96 | 35.7 |
| 30-39 | 78 | 22.6 | 18 | 23.1 | 63 | 26.0 | 57 | 21.2 |
| 40-49 | 97 | 27.7 | 10 | 12.8 | 69 | 28.0 | 30 | 11.1 |
| 50-59 | 48 | 13.7 | 2 | 2.6 | 39 | 16.0 | 30 | 11.2 |
| 60 or older | 25 | 7.1 | 3 | 3.8 | 27 | 11.2 | 13 | 4.8 |
| Education level | | | | | | | | |
| No Schooling | 2 | 0.5 | – | – | – | – | 1 | 0.4 |
| Elementary School | 173 | 49.5 | 44 | 56.4 | 116 | 47.6 | 87 | 32.3 |
| High School | 129 | 36.9 | 19 | 24.3 | 77 | 31.6 | 75 | 27.9 |
| Higher Education | 20 | 5.7 | 4 | 5.1 | 17 | 6.9 | 21 | 7.8 |
| Post-graduation | – | – | – | – | – | – | 1 | 0.4 |
| No information | 25 | 7.6 | 11 | 14.1 | 34 | 13.9 | 74 | 30.3 |
| Total | 349 | 100.0 | 78 | 100.0 | 244 | 100.0 | 269 | 100.0 |

whom 37% to single/two-rooted endodontics, 29% to surgery and 8% to molar endodontics. In the specialties single/two-rooted endodontics and periodontics, 28% of users belonged to the age group 40 to 49 years old. For molar endodontics, 33% of users were between 10 and 19 years old. For surgery, 36% of users were 20 to 29 years old. The DSC received users aged 10 to 87 years old. Most of users were women and had only elementary school level (Table 4).

In the period of one year, 1,502 specialized procedures were conducted (average 1.6 procedure per user). For the specialty endodontics of single/two-rooted teeth, 313

procedures were performed – average 0.9 procedures per user – and the most frequent procedure was one-rooted permanent tooth filling, with 211 interventions, followed by two-rooted permanent tooth filling, with 82 procedures. The average is below 1 because some referred patients get to the service with tooth loss or treatment performed somewhere else and, thus, do not get treatment at the DSC.

For molar endodontics, 63 users received 1 treatment and only 1 user got 2 interventions. For periodontics the number of performed procedures was 627 – average of 2.6 procedures/user. The most frequent procedure

(518) was corono-radicular reconstruction, followed by 111 periodontics surgeries. For surgery specialty, the number of procedures performed was 458 – average of 1.7 procedures/user. The most frequent procedure was the retained tooth removal (occlusive or impacted), with 351 interventions. The second most performed procedure was the multiple extraction with alveoloplasty, with a total of 89 procedures.

The procedures presented seasonal numerical variation with a decrease registered especially from November to March and in July. These periods coincide with the school holidays and also, with a different pattern for molar endodontics, because this specialty has hired professionals, and the production decrease happens in their holidays month. The surgery maintains its production in January thanks to the availability of volunteer internship students. The procedures conducted during the studied period did not reach the Ministry of Health parameters for the DSC type I (figures 1A and 1B). Other 16 basic procedures were performed at the DSC.

Discussion

As the DSC Jequitibá is a university DSC, it offers more hours per week than a traditional DSC, because it has more dental chairs and human resources. Even with an expanded structure, the DSC presents seasonality variation in services offer due to the Dental School calendar. Affected by the smaller experience of the students in dental care and in various indicators, the DSC Jequitibá is not able to achieve the minimum production parameters established by the Ministry of Health.

Services designed to constitute exclusively an dental specialty center can offer more comfort to users, easier appointment schedule, better structure, and the DSC manager can be closer to the dentists and users, among other advantages.⁵ The linking between the DSC and the academic training, which is the case of the DSC Jequitibá, qualifies the treatment and prepares the students to work on the secondary level of dental care for SUS.

The big number of users in the waiting list at the DSC was similar for all the specialties. The short waiting line for molar endodontics is related to the offer interruption for this specialty, to avoid that the users who received adequacy of oral cavity at the PHU would not fit in the specialized treatment, due to the long waiting list. The regulation center schedules the appointments according to the order of arrival, and there is no protocol to order the appointment according to the need in dental health

and the equity promotion.

The 18% no-show rate presented at the DSC Jequitibá is low when compared to other studies, ranging from 30 to 45%,^{6,7} and may be related to a shorter waiting time in the beginning of the DSC: the longer the waiting time is, the more the users look for other services or give up the treatment. The over-scheduling, conducted to avoid the idleness, has been too much and, thus, the no-shows should be monitored so they can have a suitable parameter.

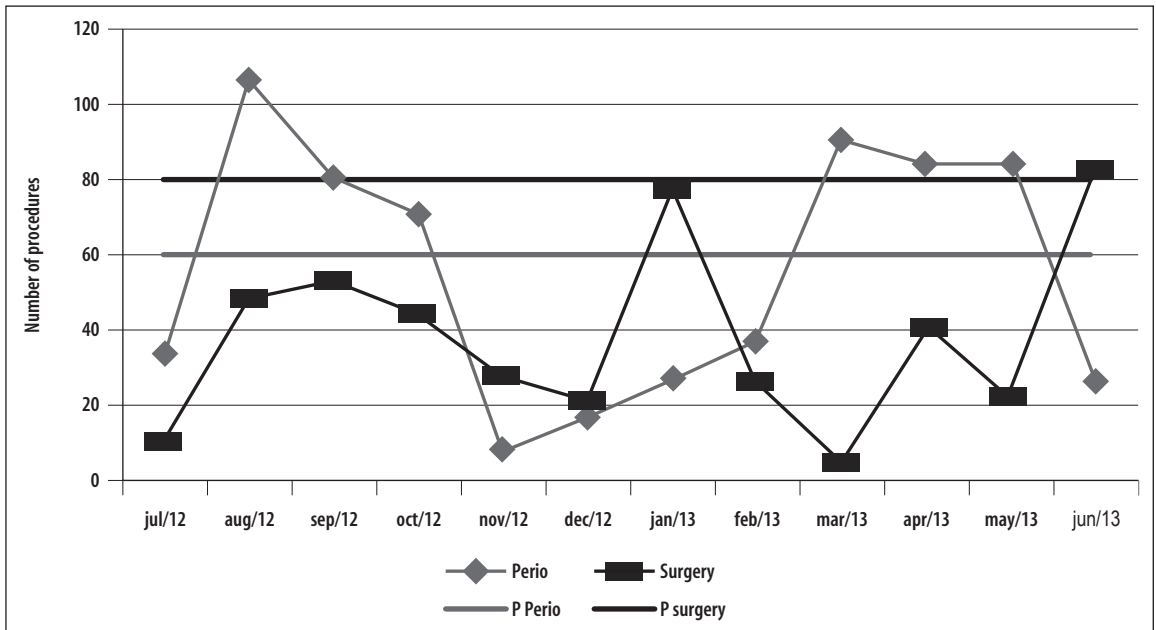
Some users get to the DSC without the adequacy of oral cavity and with no medical referral for specialized treatment. This suggests a need to better training the services professionals.¹³ The heterogeneity of referrals conducted by the PHUs is not explained by the number of working hours, nor by the size of the population assisted; it can be related to each dentist's profile. Moreover, considering the waiting time, the variability of referrals may be related to the population capacity of searching alternatives for specialized dental treatment.

We can observe similar rate of treatment abandonment for all the specialties, which points to a need of improving the PHU guidance to the users about the treatment. The absence of a multi-team at the DSC delays the treatment of users with periodontal disease who have uncontrolled chronic systemic diseases.¹⁴ In this way, it is important to improve articulation with primary healthcare so users with these diseases are referred by the PHU with a medical report.

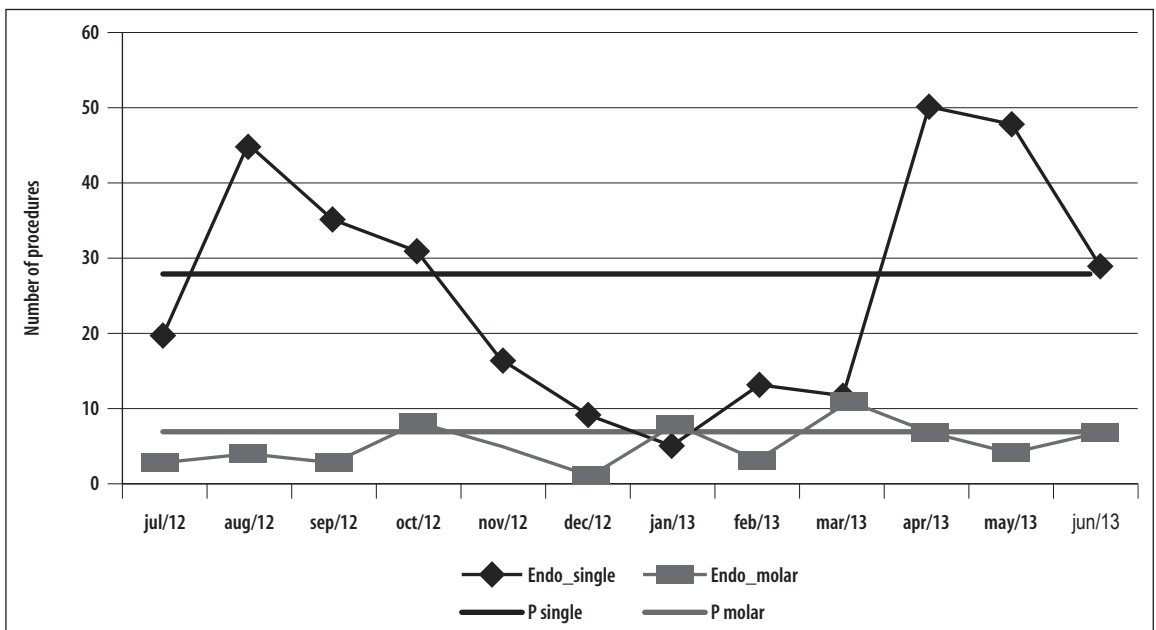
To optimize the dental services offer, it is important to solve the users' needs in the adequate complexity levels,⁸ and that the reference and counter-reference flows are respected. For all the specialties, some procedures from primary healthcare were performed, and this shows that not all the users who came to the specialized service without adequacy to the protocols – of the Ministry or Municipal Health Secretariat – were sent back to the origin PHU. So, it is important to optimize the resources use in the different levels of healthcare.

The DSC Jequitibá could not reach the parameters established by the Ministry of Health during the studied period, which implies in a risk of interrupting financial funding and even shutting down the center.¹⁵ The difference in procedures varied from 7% for endodontics to 50% for surgery.¹⁶ The number of dental procedures per inhabitant/year must vary from 0.01 to 0.04, according to the country coverage variation in 2002.¹⁷ The three specialties evaluated at the Pelotas-RS DSC achieved 40% of the minimum (1,502/328,000 inhabitants). According

1 A



1 B



P: Ministry production parameter (number of procedures)
 Endo: endodontics
 Perio: periodontics
 Mono: singles/two-rooted teeth

Figure 1 - Number of procedures performed monthly at the Dental Specialty Center - DSC - Jequitibá related to the Ministry of Health parameters for a type I DSC (periodontics; surgery [1A]; single-root tooth and molar endodontics [1B]), municipality of Pelotas, Rio Grande do Sul State, Brazil, June 2012 to July 2013

to the parameter recommended by the Ministry of Health, the number of specialized dental procedures per inhabitants/year must vary from 0.04 to 0.06,¹⁷ and the DSC Jequitibá did 10% of the minimum. We can notice the need of expanding the offer by increasing the production capacity and creating new services.

The measurement of the offer in specialized health-care can be done from the resolutions that establish a minimum number of procedures for each type of DSC e from the needs for dental specialized care estimates per inhabitant/year. A type I DSC must perform 3,060 procedures/year;¹⁶ considering the estimate need of 0.04 specialized procedures per inhabitant/year,¹⁷ there should be a coverage of 76,500 people to achieve this target. Pelotas-RS, with 328,000 inhabitants would need 4 type I DSC. Other alternatives would be 3 type II DSC or 2 type III DSC, considering that the type II DSC must perform 4,080 procedures/year and the type III DSC, 7,260.

Studies show a difference in the pattern of health services use between men and women. According to National Household Sample Survey (PNAD) data, conducted by the Brazilian Institute of Geography and Statistics (IBGE), in 2003, 71.2% of women and 54.1% of men went to medical appointment the previous year.¹⁸ This present study also reveals that the women also search more specialized dental services, showing that a bigger care with health in general also reflects in a bigger care with dental health.^{9,19}

Most of the users had low education level, according to this study. This result is coherent with other studies that show that DSC users have a socioeconomic profile similar to SUS users in general.^{20,21} This finding may denote not only equity in services access, but also shows that individuals with enough financial condition look for other services, without waiting to be treated by SUS dental care.

With regard to age, most treatments were performed in adults and adolescents; while other studies pointed out that there were more children in school age and pregnant women receiving dental treatment.^{21,22}

The inclusion of young adults in dental health services was considered to be a positive fact, because, for a long time, the healthcare provided to this age group was only for emergencies, not conservative.²³ For molar endodontics, the fact that most users are young may be explained by the attendance to reference protocols of the municipality Dental Health Guidelines, which gives priority to those in whom teeth recovery is more

feasible, once they have healthier teeth.

The necessary average time to conclude treatments at the DSC varied depending on the specialty and, it was, on average, 26 days for endodontics, which is similar to other study that presents average time of 30 days.²⁴ Concerning the average waiting time for treatment, the average among all the specialties was 95 days, which is similar to a study conducted in Bahia State, where 6.7% of users referred the waiting time to be higher than 90 days.¹⁰ Another study shows a shorter waiting time for the first appointment at the DSCs of Natal, Rio Grande do Norte State: 50 days, on average.²⁴

The DSC Jequitibá has contributed to building the integrality of dental care in Pelotas. Although it has an unusual structure for being inside a college, Pelotas-RS DSC met the conditions of structure and of specialties offer required by the Ministry of Health. In spite of not having achieved the production parameters in all the studied months, the center was useful for those users who got access to the service. We suggest the implementation of internships to try to avoid the seasonal production decrease, related to the college holidays period. The need to expand production as a way to ensure the funds transfer is clear, as well as rising the number of DSCs, in order to better treat the local population.

Regarding the appointment schedule, the regulation center is supposed to schedule the appointments based on priorities, not arrival order, promoting, thus, equity. It is also important that the regulation center works on monitoring the counter-reference from the DSC to the primary healthcare unit – PHU.²⁵

Since this study was conducted in a university DSC in its first year, the external validity of the findings for non-university services or for services that have been working for more time may be limited. However, due to the lack of resources about DSC demands, the results here presented are highly relevant.

Future studies should evaluate the population need for specialized dental care, as a way to better measure this kind of service and verify the adequacy of the proposed targets by the Ministry of Health for outpatient production in dental specialized centers – DSC.

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Authors' Contributions

Laroque, MB, Fassa, AG and Castilhos, ED designed the Project, analyzed and interpreted the results, were

responsible for drafting and the final revision of the article. All the authors approved the manuscript final version and declared to be responsible by all the work aspects, ensuring its accuracy and integrity.

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