






Compliance Analysis of the Dental Care Service Provided to Pregnant Women in Primary Health Care

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ABSTRACT

Objective: To analyze oral health services for pregnant women in the primary health care of a Brazilian metropolis, based on the performance of dentists who integrate these services. **Material and Methods:** Exploratory, descriptive and cross-sectional study was conducted through qualitative and quantitative approaches. A semi-structured questionnaire was used for data collection. This study was conducted in a Brazilian metropolis and included all dentists working in primary health care. The compliance analysis was performed considering access, adherence, group activity and individual dental care dimensions. Open questions were analyzed using the content analysis method and the closed questions were performed using frequency estimates. Bivariate statistics (Chi-square, Fisher's Exact Test, $\alpha < 0.05$) were analyzed through STATA. **Results:** 260 dentists agreed to participate in this study. Strategies to facilitate the scheduling of pregnant women to dental treatment occur in 93.9% of oral health teams, the main one being the scheduling and/or referral performed by the family health team. In terms of access and adherence to treatment, all variables in these dimensions showed relevant compliance results. The group activity dimension presented moderate compliance percentages, whereas individual care obtained high results, except for referral to radiography. **Conclusion:** The oral health service was compliant regarding access and adherence to treatment, but showed limitations in individual care and collective activities. Recommendations include improving oral health team coverage and permanent education programs.

Keywords: Primary Health Care; Pregnant Women; Prenatal Care; Dentists; Dental Care.

Introduction

Dental care in pregnancy is essential for providing proper health care to women and their babies [1]. Dental care provides better development of pregnancy, considering that shared guidelines when associated with treatment and prevention of problems and oral alterations can avoid pain and complications during pregnancy [2]. For this, it is necessary that there are trained professionals willing to provide health care for pregnant women and that these women are able to access dental services [3].

The difficulty of pregnant women in accessing dental treatment is an impairment to prenatal dental care. Some studies have shown low adherence to prenatal dental care and that the main factors observed as impairing access and use of these services were related to socioeconomic, cultural and educational aspects [3,4]. In the same line of care and enhancement of access for pregnant women, the Brazilian Ministry of Health presented the “*Previnir Brasil*” program, which among seven performance indicators for primary care, indicator 3 consists of the “Proportion of pregnant women who received dental care” with the objective of evaluating interprofessionality and comprehensive care, in order to promote the expansion of access and improvement of maternal and child health [5].

Another setback is the lack of confidence of dental surgeons in performing dental treatment to pregnant women, probably due to their poor training in dental schools [6]. The poor adherence of pregnant women to dental treatment is associated with several barriers, with emphasis on the persistence of myths and beliefs that negatively associate dental treatment to adverse events in pregnancy, with the “gain a child, lose a tooth” myth recognized in different languages and widespread in different countries and cultures [10-12]. Collective health education measures could help eliminate these myths and beliefs, with a positive impact on the health of pregnant women [1].

All these variables have the ability to positively or negatively influence the relationship between the oral health team (OHT) and the pregnant family. In view of this, this study was carried out with the objective of analyzing the access and adherence of pregnant women to oral health services, dental practice related to clinical care and collective health education aimed at pregnant women in the primary health care of a Brazilian metropolis, based on the work of dentists involved in these services.

Material and Methods

Study Design and Ethical Clearance

This is an exploratory and descriptive cross-sectional study conducted in a Brazilian metropolis with nine health districts [13]. At that time, all 360 dental surgeons who were employed in primary healthcare settings within of this Brazilian metropolis were invited to participate. This study was approved by the Research Ethics Committee of the Federal University of Minas Gerais (process 1.977.858/ March 22, 2017).

Data Collection

Data were collected through a semi-structured self-administered questionnaire. To gain a deeper insight into the profile of dental surgeons in the public network of the municipality, the initial segment of the questionnaire focused on gathering information about participants' characteristics. Among these initial questions were gender, age, time since graduation and additional training. The following questions involved dental care and consisted of 5 open and 11 closed questions in the following domains: access to dental treatment, treatment adherence, collective health activities and individual care.

The access domain had an open question for the assessment of strategies adopted by dental surgeons for scheduling dental appointments for pregnant women. The other open questions will be analyzed in a next opportunity.

The questionnaire was previously tested in a pilot study conducted in the same municipality with 18 dental surgeons who worked in the primary care setting who were not included in the main study. Cognitive interviews were carried out to check the understanding, clarity and pertinence of questions and answer options [14]. Thereafter, the answer options of questions that addressed collective health activities had to be redrafted, adding items that had not been included in the original version.

Data Analysis

After collection, data were exported to Epi Data, version 4.0.2.101, in duplicate (typed twice). The inconsistency rate in fields, which were corrected and exported to SPSS version 17.0, was 1%. Answers to open questions were assessed by Atlas Ti version 7.5.18. Content analysis with the use of the category analysis technique divided the text into categories based on analog regroupings [11]. Subsequently, the frequency of each category was estimated.

Data were submitted to descriptive analysis and absolute and relative frequencies were then obtained, considering the total number of dental surgeons who agreed to participate in the study and their distribution into the nine health districts. After the estimation of frequencies, the compliance analysis of dental surgeons' practice was carried out for each variable in the access, treatment adherence, collective activity and individual care domains (Table 1).

Table 1. Criteria used for the classification of variables into compliance and noncompliance.

| Domains | Variables | Compliance | Noncompliance |
|---------------------|--|---|--|
| Access | Monthly average for PW* one dental appointment | One to four PW; Five to ten PW; More than ten PW | No PW; Do not treat PW |
| | Strategy that facilitates scheduling dental appointments for PW | Yes | No; Do not treat PW |
| Treatment Adherence | Adherence to dental treatment | Always; Frequently; Sometimes | Rarely; Never; Do not treat PW |
| Collective Activity | There are collective activities for PW at the health center | Yes | No |
| | Dental surgeon participates in collective activities for PW | Yes | No; There is no collective activity |
| | Professionals at the health center who participate in collective activities for PW | Selection of at least one of the options: Dental surgeon; Oral health assistant; Oral health technician | No professional from the oral health team; There is no collective activity |
| | Frequency at which dental surgeon participates in collective activities for PW | Always; Sometimes; Only when invited | Never; There is no collective activity |
| Individual Care | Procedures | Group of minimum procedures: Emergency care (dental pain management); Restorations; Prophylaxis (cleaning); Supragingival scaling; Self-care instructions | Not having selected all minimum procedures; Do not treat PW |
| | Medications | Selection of at least one of the options: Amoxicillin; Dipyron; Chlorhexidine; | Selection of at least one of the options: Acetylsalicylic acid; Acyclovir; Do not treat PW |

| | | |
|-------------------|--|---|
| | Metronidazole; Paracetamol; Ibuprofen; Nystatin | |
| Anesthetics | 2% Lidocaine + Epinephrine 1:100.000 | Selection of one of the options: 3% Prilocaine + Felypressin 0.03 IU; 3% Mepivacaine without vasoconstrictor; Do not treat PW |
| Referral to X-ray | Yes | No; Do not treat PW |

PW: Pregnant Women.

The recommendations described in literature for variables were used for classifications into “Compliance” and “Noncompliance” (Table 2) [5,7,15-22]. In all domains, the answer “Do not treat pregnant woman” or “There are no collective activities for pregnant woman” was considered “Noncompliance,” as the dental surgeon or the health center do not perform the recommended procedures for the care of pregnant women. For variables whose answer options were Yes and No, positive answers were considered “Compliance” and negative ones were considered “Noncompliance”.

Table 2. Recommendations described in the literature for the classification of variables according to compliance.

| Domains | Variables | Recommendation |
|---------------------|--|---|
| Access | Monthly average for PW's* one dental appointment | Values equal to or greater than one PW were considered “Compliance”. |
| | Strategy that facilitates scheduling dental appointments for PW | Public policies establish that teams should adopt strategies for scheduling dental appointments for PW, aimed at facilitating access to treatment [14,15]. |
| Treatment Adherence | Adherence to dental treatment | Mean frequencies (sometimes) and high frequencies (always and frequently) were considered “Compliance”. |
| Collective Activity | There are collective activities for PW at the health center | Public policies recommend that collective health education measures should be conducted at health centers to provide PW with guidance and clear up any doubts and beliefs [7-9]. |
| | Dental surgeon participates in collective activities for PW | Public policies recommend the participation of dental surgeons in collective health education activities as a member of a multiprofessional team [7-9]. |
| | Professionals at the health center who participate in collective activities for PW | The presence of at least one of the professionals from the oral health team was considered “Compliance”. |
| Individual Care | Frequency at which the dental surgeon participates in collective activities for PW | Mean frequencies (sometimes and only when invited) and high frequencies (always) were considered “Compliance”. |
| | Procedures | Minimum procedures were those considered essential for the dental treatment of PW, based on studies that assessed the patterns of oral health needs and dental care protocols [7,12-14]. Surveys indicate that PW seek care when they have dental pain [14], described in the questionnaire as emergency care (dental pain management). Among the major dental disorders detected in PW are cavitated carious lesions [12,13], treatable with restorations [5], and gingivitis [7,13,14], in which treatment includes prophylaxis or supragingival scaling [5]. |
| | Medications | The Food and Drug Administration (FDA) [15] classifies medications according to their teratogenic effects. Medications classified as category B and C were among the answer options for this question [15]. Dental surgeons who chose category B (amoxicillin, metronidazole, dipyrrone, paracetamol, ibuprofen, nystatin, chlorhexidine) [5,16] were considered “Compliance” and those who chose at least one |

| | |
|-------------------|--|
| Anesthetics | medication from category C (acyclovir and acetylsalicylic acid) [16] were considered “Noncompliance”. Answer options included local anesthetics available from the public health system: 2% lidocaine + epinephrine 1:100.000, 3% prilocaine + felypressin 0.03 IU and 3% mepivacaine without vasoconstrictor. The literature recommends the use of 2% lidocaine + epinephrine 1:100.000, considered to be safe for PW [7,16,17]. |
| Referral to X-ray | Radiographs during pregnancy are not contraindicated because the radiation dose that reaches the fetus in the uterus is not enough to cause congenital malformations [5,7,16]. Given the benefits to diagnosis and treatment, referral to X-ray was considered “Compliance”. |

PW: Pregnant Women.

After the classification of variables, domains were classified according to compliance. For the practice of dental surgeons to be considered “Compliance”, they should have had complied with all analyzed variables in each domain. Score 0 (zero) was used for variables classified as “Noncompliance” and score 1 (one) otherwise. The scores obtained for each variable were summed and the clinical practice of dental surgeons who obtained the maximum score was considered “Compliance”. Subsequently, compliance in terms of domains for health districts was determined in order to identify possible variations across districts. Bivariate statistical analyses were then performed, including the Chi-square Test and Fisher's Exact Test, at 5% statistical significance level ($\alpha < 0.05$), using the STATA™ statistical package.

Results

Two hundred and sixty dental surgeons from nine health districts agreed to participate in the study, corresponding to a response rate of 76% (260/342, considering that 18 dentists from the pilot study were not included). From the initial segment of the questionnaire, it was identified that most dental surgeons were female (71.5%) with a mean age of 45 (± 11.6) years, with time since graduation of more than 10 years (73.7%), belonged to OHT affiliated with the Family Health Strategy (90.4%), and had finished their graduate studies (88.1%). Among graduate programs attended, Public Health/Collective Health (43.6%) and Endodontics (9.1%) stood out. Strategies for scheduling dental appointments for pregnant women were used in 91.5% of OHT, especially carried out by the family health team in the first prenatal care visits (Table 3).

Table 3. Strategies for scheduling dental appointments for pregnant women.

| Strategies for Scheduling Dental Appointments | N | % |
|---|-----|-------|
| Scheduling and/or referral from the first prenatal care visits | 118 | 49.6 |
| Scheduling priority | 87 | 36.5 |
| Dental appointment scheduled for the same day as the prenatal visit | 10 | 4.2 |
| Active search | 8 | 3.4 |
| Appointment scheduled in group of pregnant women | 6 | 2.5 |
| Immediate care | 5 | 2.1 |
| Other strategies | 4 | 1.7 |
| Total [†] | 238 | 100.0 |

[†]Total number of dental surgeons who adopted strategies for scheduling dental appointments for pregnant women.

In the access and treatment adherence domains, all analyzed variables were in compliance in more than 90% of cases. On the other hand, the referral to X-ray variable in the individual care domain had the lowest compliance level (36.2%) (Table 4).

Table 4. Compliance frequency per variable (n=260).

| Domains | Analyzed Aspects | Compliance | | Noncompliance | |
|---------------------|--|------------|------|---------------|------|
| | | N | % | N | % |
| Access | Monthly average for PW's 1st dental appointment | 245 | 95.7 | 11 | 4.3 |
| | Strategy that facilitates scheduling dental appointments for PW | 244 | 94.6 | 14 | 5.4 |
| Treatment Adherence | Adherence to dental treatment | 249 | 95.8 | 11 | 4.2 |
| Collective Activity | There are collective activities for PW at the health center | 141 | 55.3 | 114 | 44.7 |
| | Dental surgeon participates in collective activities for PW | 94 | 37.3 | 158 | 62.7 |
| | Professionals at the health center who participate in collective activities for PW | 137 | 61.7 | 85 | 38.3 |
| | Frequency at which dental surgeon participates in collective activities for PW | 146 | 62.4 | 88 | 37.6 |
| Individual Care | Procedures | 241 | 92.7 | 19 | 7.3 |
| | Medications | 253 | 97.3 | 7 | 2.7 |
| | Anesthetics | 190 | 73.9 | 67 | 26.1 |
| | Referral to X-ray | 92 | 36.2 | 162 | 63.8 |

PW: Pregnant Women.

Table 5 shows the compliance analysis of dental practices per region, with results analyzed according to each health district. It was observed that the compliance values for the Eastern and Northeastern districts were higher than those obtained for the entire municipality, whereas values for the Northwestern and Western districts were lower than those obtained in all domains. However, there was no statistical difference in terms of territory among districts ($p>0.05$), demonstrating that there are no discrepancies in the offer and performance of prenatal dental care in the territory.

Table 5. Compliance frequency distribution in the analyzed domains per health district (n=260).

| District | Access* | | Treatment Adherence* | | Collective Activity* | | Individual Care* | |
|--------------|---------|-------|----------------------|-------|----------------------|------|------------------|------|
| | N | % | N | % | N | % | N | % |
| Barreiro | 34 | 94.4 | 35 | 97.2 | 12 | 33.3 | 12 | 33.3 |
| Mid-Southern | 11 | 73.3 | 14 | 93.3 | 8 | 53.3 | 1 | 06.7 |
| Eastern | 20 | 95.2 | 21 | 100.0 | 9 | 42.9 | 6 | 28.6 |
| Northeastern | 43 | 93.5 | 46 | 100.0 | 21 | 45.6 | 13 | 28.3 |
| Northwestern | 22 | 84.6 | 22 | 84.6 | 7 | 26.9 | 6 | 23.1 |
| Northern | 19 | 76.0 | 25 | 100.0 | 8 | 32.0 | 9 | 36.0 |
| Western | 29 | 82.9 | 31 | 88.6 | 7 | 20.0 | 4 | 11.4 |
| Pampulha | 23 | 100.0 | 23 | 100.0 | 5 | 21.7 | 5 | 21.7 |
| Venda Nova | 30 | 90.9 | 32 | 97.0 | 10 | 30.3 | 5 | 15.2 |
| Municipality | 231 | 88.8 | 249 | 95.8 | 87 | 33.5 | 61 | 23.5 |

*No statistical difference in relation to the domains per health district ($p>0.05$).

Discussion

This study sought to evaluate the dental care of pregnant women provided by dental surgeons in the primary health care. Results showed that dental treatment is usually provided to pregnant women at primary care centers of the municipality.

Public dental services have faced challenges in providing access to pregnant women, primarily due to barriers that hinder appointment scheduling [3]. As a solution to this problem, pregnant women should be prioritized for dental treatment and that there should be joint action with the family health team [3,6]. In this sense, public policies recommend that the OHT should work in partnership with the family health team, so that the pregnant woman, when starting prenatal care, is referred to a dental appointment in order to guarantee

treatment during pregnancy [16]. This study found that these proposed solutions seemed to be well accepted by the team, as many OHT members have developed strategies, such as scheduling or referrals during early prenatal visits, to facilitate access for pregnant women. Such collaborative action among healthcare professionals proved to be feasible and should be included in the list of measures to be implemented during prenatal care.

The "*Previne Brasil*" program of the Brazilian Ministry of Health recommends using the proportion of pregnant women who receive dental care as an indicator. The initial target for this indicator was 60%, but in the second quarter of 2023 in this municipality, only 44% of pregnant women received dental care [5,25]. A systematic review on access to dental care for pregnant women showed that in different countries, the prevalence of use of OHT ranged from 27.3% to 83%. Therefore, when comparing data from this municipality with international data and targets set by "*Previne Brasil*", suboptimal values were found. Low OHT coverage among the estimated population of only 42.4% in the municipality could be a contributing factor. In contrast, primary care coverage extends to the entire territory, with family health teams covering 81.41% [13]. This indicator is impacted by the fact that the denominator includes all locally recruited pregnant women. The limited number of dental surgeons in relation to the population size can cause delays in scheduling initial appointments and follow-up visits, thus hindering access to dental treatment for pregnant women. This issue is not unique to the municipality where this study was conducted, as evidenced by another study on prenatal visits in Brazilian primary care facilities, which found that the lack of oral cavity exams may be linked to lower coverage of oral health teams compared to medical and nursing teams [26]. The implications in terms of coverage are so relevant that the Brazilian Ministry of Health suggests, as one of the strategies to improve this indicator, increasing the OHT accreditation in family health program or OHT with different workload to increase the access of pregnant women to dental care in the primary health care [5]. This is the model recommended by the Ministry of Health for the creation of bonds, longitudinality of care and to improve shared care.

Access and adherence dimensions reflect the organization of the OHT work process and, in this study, these dimensions were presented. Adherence to dental treatment was not identified as a barrier, either because a single variable was used or because access to dental care allowed for the first contact of pregnant women with OHT, helping eliminate beliefs and overcome the fear of pain during treatment. Among strategies described by dental surgeons (Table 3), two categories are related to treatment adherence: dental appointment scheduled for the same day as the prenatal visit and active search. In the former, adherence increases and absenteeism decreases since that doctors, nurses, and dental surgeons work at the same primary care center and, therefore, patients do not have to return on different days for their appointments. Active search allows pregnant women who miss their appointments or who fail to be adherent to the treatment to perceive the importance of dental care for healthy and safe pregnancy [6], encouraging them to continue with treatment. The interaction between the family health team and OHT can be seen in the strategies for facilitating access and adherence to dental treatment, which demonstrates that this is a form used by the municipality to organize the dental care provided to pregnant women.

Collective activities are also an integral part of dental care for pregnant women, but unlike access and treatment adherence domains, they did not show high compliance levels for the analyzed variables. It was observed that 55.3% of study participants reported that primary care centers where they work offer collective health activities, but only 37.3% of dental surgeons participated in these activities. Collective activities apparently take place at primary care centers; however, dental surgeons rarely participate in them, despite the fact that public policies recommend frequent and multiprofessional collective activities for pregnant women [7-9].

The important role of dental surgeons and OHT members in these activities is shown in studies on oral health education measures, which demonstrate that instructions received during pregnancy influence children's introduction to oral hygiene, early visit to the dentist, reduction of severe caries in early childhood, in addition to breastfeeding habits and self-perception of health status and oral hygiene [1,27,28]. These activities are perfect for showing that dental treatment can be performed during pregnancy and that it is not harmful to the mother or baby, thereby eliminating myths that negatively affect dental care [1]. Stimulating the participation of dental surgeons in these activities is important since they become involved with health education. It is crucial that OHT members participate in these collective actions, helping in their formulation and application, also evaluating them with other health professionals and with patients.

The dental care domain addressed issues related to professional practice that most frequently cause concern among dental surgeons [7-9]. Virtually all professionals perform dental procedures and prescribe medications adequately. Knowledge of the administration of anesthetics varied, especially regarding the use of 3% mepivacaine without vasoconstrictor. Previous recommendations, including the 2008 Women's Health Care Protocol [29] for the public health service of that municipality, advocated the use of anesthetics without vasoconstrictor on pregnant women. The local oral health service in its most recent protocol [16], as well as guidelines from the Brazilian Ministry of Health [18], recommend the use of 2% lidocaine + epinephrine 1:100.000; nevertheless, this recommendation does not seem to be incorporated into the clinical practice of these dentists.

Referral to X-ray had the lowest compliance levels in this study, revealing that this still causes uncertainty among dental surgeons even though the literature provides evidence that dental radiographs are safe during pregnancy [7,16,22]. Uncertainty over the administration of the most widely used anesthetic and the fear of referring pregnant patients to radiographic examination underscore the need for continuing health education of dental surgeons.

From the compliance analysis carried out by health districts (Table 5), it was observed that the Eastern and Northeastern districts presented values above those attributed to the municipality. In contrast, the Northwestern and Western districts presented lower values in all analyzed dimensions. However, no statistical difference was observed between the analyzed dimensions, demonstrating that there were no relevant discrepancies in the provision and performance of dental prenatal care in the territory.

The compliance analysis of domains per region showed rates of 88.8% for access and 95.8% for treatment adherence, which probably resulted from the organization of dental care provided to pregnant women at the local level. However, the rate for collective activities was lower (33.5%), due to some extent to the fact that dental surgeons failed to participate in such activities, not following the available recommendations [7-9]. Individual care showed a much lower compliance level (23.5%) in the entire municipality, especially because 63.8% of dental surgeons failed to refer pregnant women to radiographic examination, combined with the use of contraindicated anesthetics, affecting the final results in this domain.






The results obtained in this study are limited to the work of dental surgeons. Other assessments from different perspectives – managerial, organization, and patients – are needed.

Conclusion

This study offers an overview of dental care for pregnant women in a Brazilian metropolis based on an innovative compliance analysis related to oral health care. The oral health service was compliant regarding access and adherence to treatment, showing limitations in individual care and collective activities. To address these

deficiencies, it is recommended to improve the OHT coverage in the municipality and establish a permanent education program for professionals to address non-compliance areas. Additionally, the promotion of collective activities focused on health education for pregnant women and the local community can help strengthening relationships and knowledge-sharing. This study can serve as a subsidy for the planning and organization of prenatal dental care in other municipalities throughout Brazil.

Authors' Contributions

| | | | |
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| PMN |  | https://orcid.org/0000-0003-0041-0408 | Conceptualization, Methodology, Formal Analysis, Investigation, Writing - Original Draft and Writing - Review and Editing. |
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All authors declare that they contributed to critical review of intellectual content and approval of the final version to be published.

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Conflict of Interest

The authors declare no conflicts of interest.

Data Availability

The data used to support the findings of this study can be made available upon request to the corresponding author.

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