Dental care for pregnant patients: a survey to assess the current practices of Alabama dentists

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A commitment on the part of dentists to provide dental care to pregnant patients may contribute to alleviating the burden of oral disease experienced in this population. To assess barriers to providing dental care for pregnant patients, a survey instrument was developed and distributed to 472 Alabama Academy of General Dentistry members. Descriptive analyses were conducted to assess dental care practices, self-reported competence, and barriers to providing dental care. Bivariate analyses were conducted to determine whether dentists with and without residency training displayed differences in self-reported competence and dental care practice models. A total of 82 dentists completed the survey, yielding a response rate of 17.3%. Of the respondents, 93.9% reported providing dental care to pregnant patients in the past year. Lack of education and/or training was the most frequently identified barrier (41.5%) to the provision of care. Statistically significant associations were found between self-reported competence and residency training ($\chi^2 = 4$; $P = 0.034$; $\Phi = 0.235$). Residency training may influence dentists' self-reported competence in providing care to pregnant patients. Dentists who did not receive residency training appeared more likely to report competence in their ability to provide such care. Most respondents reported providing dental care to pregnant patients, but only 40.6% of the respondents to the 2015 Alabama Pregnancy Risk Assessment Monitoring System (PRAMS) survey reported receiving a dental cleaning during pregnancy. Implementing systems to connect these patients with dentists may increase the receipt of care among this group.

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Dental care during pregnancy is often out of reach because of barriers to access. Some of these barriers may include misconceptions held by mothers and/or dentists regarding dental care during pregnancy, dentists' feelings of incompetence related to their ability to provide care to pregnant patients, and the limited availability of dentists providing care to pregnant patients.[1] According to the 2017 data from the Centers for Disease Control and Prevention Pregnancy Risk Assessment Monitoring System (PRAMS), only 46.3% of survey participants in the United States reported receiving a dental cleaning during their pregnancy.[2] Dental care during pregnancy is essential to the overall health of the mother, and routine dental care should be delivered throughout the pregnancy term.

According to the 2015 Alabama PRAMS report, approximately 40.6% of survey participants reported receiving at least one dental cleaning during their pregnancy.[3] This is noticeably less than the national average of 46.3%. Additionally, 22.1% of the survey participants reported needing to see a dentist for a problem.[3] Access to dental care among pregnant patients in Alabama is a significant public health concern. Improving this access may benefit the oral health of the patient and contribute to a healthy pregnancy.

Pregnancy has been associated with the onset of several oral health conditions, which may be attributed to changes in habits and hormones. As noted by the American College of Obstetricians and Gynecologists, these conditions may include gingivitis, periodontitis, dental caries, and tooth erosion.[4] According to the American Academy of Pediatric Dentistry, factors that affect the oral health of pregnant women include nausea or vomiting, which is common during the first trimester, and changes in diet, such as increased carbohydrate load due to greater frequency of snacking.[5] The increased experience of vomiting contributes to perimylolysis, an erosion of the lingual surfaces of teeth resulting from exposure to stomach acids. Additionally, increased frequency of snacking and exposure to carbohydrates contributes to an increase in dental caries. It is estimated that about 40% of pregnant women experience some form of periodontal disease.[4]

Pregnant patients need proper counseling on oral healthcare and treatment of oral disease by dentists who are competent and comfortable with treating this population. Studies have demonstrated that receiving dental care during pregnancy is not a significant risk to the health of the mother or child if clinically researched and proven guidelines are followed.[6] Barriers to the acquisition of dental care by pregnant patients may involve multiple factors. In Alabama, 24.6% of surveyed pregnant patients reported not seeking dental care during pregnancy because they were concerned about the safety of the developing fetus, while 11.2% reported they could not find a dentist or clinic

that accepted pregnant patients.[3] Other reasons that pregnant patients cite for not obtaining dental care include financial insecurity or lack of dental insurance coverage, miseducation regarding oral health services during pregnancy, fear of dental materials, and lack of transportation.[7]

Dentists may assure pregnant patients that pregnancy does not require abstaining from dental care and that receipt of preventive, diagnostic, therapeutic, and other necessary dental care is essential to maintaining oral health and contributing to a healthy pregnancy outcome.[8] A commitment by dentists to providing dental care to pregnant patients may help to alleviate the burden of oral disease experienced in this population. A national study of US dentists regarding the dental care practices of pregnant patients is needed, but some studies have been completed at the state level. In North Carolina, 86.5% of 513 general dentists who were surveyed reported that they provided dental care to pregnant women in their practice, while just 48.3% claimed to provide comprehensive care.[9] In contrast, Ohio dentists were noted to routinely postpone dental care until after pregnancy for reasons including concerns for procedure safety, patient perception of risks, or malpractice concerns, as well as a fear of labor and/or delivery during a procedure.[10] In addition to these reasons, a study of Michigan dentists revealed a reluctance on the part of dentists to accept Medicaid-insured pregnant patients due to the difficulty of receiving reimbursements and poor patient compliance regarding maintaining appointments.[1]

Dentists' hesitation to deliver care to pregnant patients may be a barrier to care for this patient population. Of 347 dentists who participated in the Michigan study, 64% expressed interest in receiving more information to enhance their knowledge of providing dental care to pregnant patients; additionally, 54% expressed a desire to attend interprofessional collaborations or continuing education (CE) courses with women's healthcare providers in their community.[1]

A study of Oregon general dentists revealed that female dentists, dentists who saw more pregnant patients, and dentists who did not own the practice in which they worked were more likely to provide oral health counseling to pregnant patients.[11] Oral health counseling practices were also examined based on the county of practice, and it was determined that no relationship existed.[11] Another analysis of the same survey data indicated that increased availability of CE opportunities could improve dentists' competence and comfort in treating pregnant patients.[12]

On November 5, 2019, the Alabama Department of Public Health released its first state oral health plan, including objectives aiming to improve the oral health of pregnant patients in Alabama. These objectives pertain to improvements in dental school curricula, the collection and sharing of data pertaining to pregnant women accessing dental care, an increase in the number of questions about dental visits during pregnancy on the Alabama PRAMS survey, and engaging social workers at county health departments to collect data from patients receiving maternity care.[3]

Previous studies have examined the comfort level of dentists treating pregnant patients and whether dentists were interested in receiving CE on providing dental care to pregnant patients.[1,7,12] Other studies have also examined dentists' willingness to provide dental care to pregnant patients and the types of dental care believed appropriate for pregnant patients.[9-13] The present study aimed to investigate the current practices of general dentists in Alabama for providing dental care to pregnant patients and the educational factors that may influence a dentist's approach to dental care for pregnant patients.

Methods

Development of survey instrument

The dental literature detailing the educational competence and practice models of dentists as applied to pregnant patients was reviewed. Previous studies that surveyed dentists and dental hygienists regarding the dental care of pregnant patients were used as models to develop the survey instrument used in the present study. Those studies include the Connecticut study conducted by Pina and Douglass, the North Carolina study conducted by da Costa et al, the Oregon study conducted by Huebner et al, and the Michigan study conducted by Schramm et al.[7,9,12,14] The data collection instrument was a 19-question survey that included sections on current practices for providing dental care to pregnant patients, self-reported educational competence in providing dental care to pregnant patients, barriers to providing dental care to pregnant patients, and demographic characteristics of the dentists, including age, sex, race/ethnicity, number of years in practice, and practice setting. The survey was distributed electronically to dentists who consented to participate and was available for participants from January 20, 2020, to May 31, 2020.

Study setting

The study population consisted of members of the Alabama Academy of General Dentistry (ALAGD) who were actively licensed dentists practicing general dentistry in Alabama before January 2020. The ALAGD member contact list was used to distribute the Qualtrics-generated survey link to 472 dentists. Of these 472 dentists, 25 opted out of future communications. The remaining 447 dentists were sent 14 reminder emails including the aims and objectives of the study. Reminders were sent biweekly from January to March and then weekly from March to May. The requirements of the Alabama Dental Practice Act were consulted to develop the study participation criteria.[15] To participate in the study, respondents had to meet the following inclusion criteria: minimum age of 19 years, current licensure to practice general dentistry in the state of Alabama, ability to read and comprehend the English language, access to email on an electronic device with capabilities that allowed for survey participation, and provision of electronic consent to participate in the study. Dentists excluded from this study were those with no email address listed with the ALAGD and those unwilling or unable to provide consent to participate.

Statistical analysis

Univariate descriptive analyses were conducted to explore the sociodemographic information, which included age, sex, race/ethnicity, location of dental school and residency training, years in practice, and practice setting. Descriptive analyses were also conducted to explore practices for providing dental care to pregnant patients, dentists' self-reported educational competence in providing dental care to pregnant patients, and barriers to providing dental care to pregnant patients. Bivariate analyses

(chi-square [χ^2] with the phi correlation coefficient [Φ]) were conducted to examine the presence and strength of relationships between dentists' demographic characteristics, dental care practices, educational competence, and perceived barriers to the provision of care to pregnant patients. The associations were considered statistically significant if $P < 0.05$. Due to the small sample size, response frequency analysis was also conducted to assist in identifying trends in the variables.

Results

Dentist demographics

The response rate of the survey was 17.3% (n = 82). The majority of respondents attended the University of Alabama at Birmingham (UAB) School of Dentistry (90.2%), identified as White (91.5%), and practiced in a solo (56.1%) or group (32.9%) setting (Table 1). No differences in dental care practices were found based on age, sex, race/ethnicity, years in practice, or practice setting. However, differences in dental care practices were discovered when the respondents' dental school and history of residency training were assessed.

Current practices and barriers

A majority of respondents (93.9%) reported that they had provided dental care to pregnant patients in the past year (Table 2). Most (98.8%) provided oral hygiene education that specifically addressed the needs of pregnant patients. More than half of the respondents (63.2%) accepted pregnant patients for treatment through referral, suggesting that options are available for patients in need of a dentist. The practice model of choice for more than half of the respondents (63.4%) was to provide emergency, routine hygiene, and preventive dental care while delaying all elective procedures until after pregnancy. Regarding dental care models for specific procedures, most respondents (95.1%) reported providing hygiene and preventive care, dental radiographs, emergency care, palliative care, restorative treatment, endodontic treatment, and nonsurgical extractions to pregnant patients.

Only 4.9% of the respondents reported delaying dental care to pregnant patients. The stated reasons for not providing dental care were either that provision of care to pregnant patients requires special materials/equipment not available in the practice (33.3%) or the dentist was trained to delay care for pregnant patients until after the pregnancy (66.7%).

In terms of perceived barriers to the provision of dental care for pregnant patients, lack of education or training was the most frequently cited barrier (41.5%), while the second most frequently reported barrier was the patient's lack of dental insurance (26.8%).

Educational competence

Most survey respondents (85.4%) reported feeling competent in their ability to provide dental care to pregnant patients (Table 3). In addition, more than half (67.1%) reported being familiar with resources where guidelines for dental care of pregnant patients may be obtained. According to the survey results, dentists were more open to CE when given the opportunity to take the course at regularly attended meetings or conferences (30.5%) or online (30.5%).

Relationships involving dentists' self-reported competence

Statistically significant results were observed when self-reported competence was tested against the location of dental school training ($\chi^2 = 8.875$; $P = 0.003$; $\Phi = 0.329$) (Table 4). Dentists who attended the UAB School of Dentistry were more likely to report competence in their ability to treat pregnant patients than were dentists who received training at other institutions. Residency training also had a significant effect on self-reported competence results ($\chi^2 = 4.514$; $P = 0.034$; $\Phi = 0.235$) (Table 5). Dentists who did not receive residency training appeared more likely to report competence in their ability to provide dental care to pregnant patients based on the training and education received in dental school. This finding suggests that dentists with no residency training perceived that their dental school training sufficiently prepared them for treating pregnant patients.

Discussion

This study attempted to fill in gaps from previous studies that did not explore the relationships between the demographic information and prior training of dentists and their dental care treatment practices for pregnant patients. This study revealed no relationships between dentists' sex or practice setting and their behaviors in providing dental care to pregnant patients. Likewise, no relationships were found between dentists' age, race/ethnicity, or number of years in practice and their dental care practices regarding pregnant patients. Similar to observations in the Oregon study, no relationships were found between the care practices and the county in which the dentist practiced.[10] However, the present sample was not large or diverse enough to appropriately represent all Alabama counties.

Similar to what was seen in a study of Michigan dentists, respondents did not report legal concerns as a reason for not providing dental care to pregnant patients.[1] This suggests that these factors may not be as influential in dentists' decisions to provide dental care as other factors, but further investigation with a larger sample would be necessary to confirm. In the present study, the barriers revealed to be of most concern to dentists in treating pregnant patients were a lack of education/training and a lack of insurance.

A study of Michigan dentists determined that a majority of the sample was interested in attending interprofessional collaborations or CE with a focus on providing dental care to pregnant patients, but the preference for the type of delivery of the CE was not considered.[1] The present study therefore sought to identify dentists' preferences for CE training as it pertains to the dental care of pregnant patients. Trends in the results suggested that the availability of CE on this topic at meetings or conferences, or through online platforms, may influence dentists' decision to participate.

In the present study, a relationship was found between dentists' self-perceived competence in providing care to pregnant patients and 2 demographic qualities: the location of their education and whether they completed residency training. Although dentists who attended the UAB School of Dentistry appeared more likely to report feeling competent to provide dental care

Table 1. Demographic information of survey respondents (N = 82).

Variable	n (%)
Age (y)	
< 35	24 (29.3)
35-49	21 (25.6)
50-64	28 (34.1)
≥ 65	9 (11.0)
Sex	
Male	53 (64.6)
Female	29 (35.4)
Race/ethnicity	
Black or African American	3 (3.7)
Native Hawaiian or other Pacific Islander	1 (1.2)
White	75 (91.5)
Latino	1 (1.2)
Declined to answer	2 (2.4)
Dental school attended	
UAB	74 (90.2)
Other	8 (9.8)
Years in practice	
0-9	25 (30.5)
10-19	17 (20.7)
20-29	9 (11.0)
30-39	22 (26.8)
40-49	5 (6.1)
No answer	4 (4.9)
Residency training	
AEGD	12 (14.6)
GPR	19 (23.2)
Prosthodontics	1 (1.2)
None	50 (61.0)
Practice setting	
Solo private practice	46 (56.1)
Group private practice	27 (32.9)
Corporate practice	4 (4.9)
Community health clinic/ nonprofit clinic	4 (4.9)
Faculty practice/academic institution	1 (1.2)

Abbreviations: AEGD, Advanced Education in General Dentistry; GPR, General Practice Residency; UAB, University of Alabama at Birmingham School of Dentistry.

Table 2. Current practices and barriers to providing dental care to pregnant patients (N = 82[a]).

Question	n (%)
Provided dental care to pregnant patients in past year	
Yes	77 (93.9)
No	5 (6.1)
Accepts pregnant patients through referral if care provided in past year	
Yes	48 (63.2)
No	28 (36.8)
Primary reason for not providing dental care to pregnant patients (n = 3)	
The dental care of pregnant patients requires special materials/ equipment that I do not have available in my practice.	1 (33.3)
I was trained to delay care for pregnant patients until after the pregnancy.	2 (66.7)
Dental care model for pregnant patients for specific procedures[b]	
I provide dental care during all trimesters.	50 (61.0)
I first require a medical clearance from the patient's physician.	28 (34.1)
I delay dental care until after pregnancy.	4 (4.9)
Dental practice model for treating pregnant patients	
I provide only emergency dental care to pregnant patients.	1 (1.2)
I provide pregnant patients with emergency, routine hygiene, and preventive dental care, but elective restorative procedures are delayed until after pregnancy.	52 (63.4)
I provide pregnant patients all services of dental care by modifying the care to follow guidelines for pregnant patients.	29 (35.4)
Provides oral hygiene education specifically addressing needs of pregnant patients	
Yes	81 (98.8)
No	1 (1.2)
Barrier that may most influence commitment to providing dental care to pregnant patients	
Lack of education/training	34 (41.5)
Lack of time	10 (12.2)
Staffing limitations	3 (3.7)
Patient's lack of insurance	22 (26.8)
Cultural incompetence/language barrier	13 (15.9)

[a]Some respondents did not answer all questions. Percentages were calculated based on the number of responses to each question.

[b]Hygiene and preventive care, dental radiographs, emergency care, palliative care, restorative treatment, endodontic treatment, and nonsurgical extractions.

Table 3. Educational competence in providing dental care to pregnant patients (N = 82).

Question	n (%)
Feels competent in ability to provide dental care to pregnant patients based on training and education received in dental school (excluding residency)	
Yes	70 (85.4)
No	12 (14.6)
Familiar with resources from which current guidelines on dental care of pregnant patients may be obtained	
Yes	55 (67.1)
No	27 (32.9)
Use of guidelines from credible resources would improve confidence in providing dental care to pregnant patients	
Yes	78 (95.1)
No	4 (4.9)
Factor that may most influence attendance at courses or trainings pertaining to dental care of pregnant patients	
Cost of course/training	8 (9.8)
Amount of time required to complete course/ training	6 (7.3)
Continuing education credits provided	5 (6.1)
Availability of course at regularly attended meeting or conference	25 (30.5)
Ability to take course online	25 (30.5)
Number of pregnant patients I treat in my practice annually	4 (4.9)
No interest in attending courses or trainings pertaining to dental care of pregnant patients	9 (11.0)

Table 4. Self-reported competence in relation to the dental school attended by the respondent (N = 82).

Feels competent[a]	UAB, n (%)	Other, n (%)	χ^2	*df*	*P*	ϕ
Yes	66 (80.4)	4 (4.9)	8.875	1	0.003[b]	0.329
No	8 (9.8)	4 (4.9)				

Abbreviation: UAB, University of Alabama at Birmingham School of Dentistry.

[a]Feels competent in ability to provide dental care to pregnant patients based on dental school training and education.

[b]Statistically significant difference (chi-square test; $P < 0.05$).

Table 5. Self-reported competence in relation to the completion of residency training (N = 82).

Feels competent[a]	Residency,[b] n (%)	None, n (%)	χ^2	*df*	*P*	ϕ
Yes	24 (29.3)	46 (56.1)	4.514	1	0.034[c]	0.235
No	8 (9.7)	4 (4.9)				

[a]Feels competent in ability to provide dental care to pregnant patients based on dental school training and education.

[b]Advanced Education in General Dentistry Residency, General Practice Residency, or Prosthodontics Residency.

[c]Statistically significant difference (chi-square test; $P < 0.05$).

to pregnant patients than dentists who were not UAB graduates, 90.2% of the sample received dental training from UAB. A sample including more dentists who received training from other institutions would be needed for more accurate findings. Similarly, dentists who did not receive residency training, 61.0% of the sample, were more likely to report feeling competent to provide dental care to pregnant patients than dentists who did complete an advanced dental education program. This may suggest that respondents perceived either training during dental school or taking CE courses as offering adequate preparation for providing dental care to pregnant patients. Further investigation into which method of training best prepared those dentists for providing such care may facilitate improvement in dental school curricula or CE opportunities.

The limitations of the study are associated with the low response rate and the homogeneity of the sample. These findings may not be generalizable and would need to be replicated among a larger, and ideally more diverse, sample of dentists. The onset of the COVID-19 pandemic in the United States is suspected to have impacted the response rate, as dentists in Alabama were suspended from practice from March 19 to May 1, 2020. Dentists who may have accessed their emails only from their office would not have received reminder emails during this period. Dentists who did receive reminder emails may not have been motivated to take a survey when restoring safety and function to their practice was a priority.

Conclusion

The findings of this study suggest that dentists' demographic characteristics, including age, sex, race/ethnicity, number of years in practice, and practice setting, have no relationship with their practices of dental care for pregnant patients. However, relationships were determined to exist between dentists' self-reported competence in providing such care and both the location of their dental training and whether they completed a dental residency.

Access to quality CE opportunities at annual meetings or via online platforms may allow dentists to further their knowledge on the provision of dental care for pregnant patients. State dental associations and departments of public health may support dentists in accessing guidelines from credible resources about providing dental care for pregnant patients.

Securing links between dentists who provide dental care to pregnant patients and this patient population may improve access to care. In addition, engagement of programs that

provide services to pregnant patients may maximize the reach of education efforts. The Women, Infants, and Children program, Medicaid, or programs at local health departments and community health centers may provide access to pregnant patients who do not receive routine dental care and are out of reach of the dentist.

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