Oral Health Status, Oral Hygiene Practices, and Factors Affecting Dental Treatment Utilization among Pregnant Women in Dubai

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Keywords

Oral health · Oral hygiene · Dental treatment · Pregnancy

Abstract

Objective: Oral health is an integral part of preventive healthcare for pregnant women. This study aimed to determine the oral health problems and oral hygiene practices and identify the factors affecting dental treatment utilization among a representative population of pregnant women in Dubai. **Methods:** A cross-sectional study was conducted using data from anonymous structured questionnaires filled by 1,450 pregnant women attending primary health centers across different geographical locations in Dubai. **Results:** Of the 1,450 women, 97.8% brushed at least once a day. At least one dental problem during pregnancy was reported by 49.9%, but dental attendance during pregnancy was only 17.4%. Factors associated with dental visits were nationality, previous pregnancy, oral health problems, brushing habits, routine dental visits, and professional advice on oral care. The odds of dental attendance increase for UAE national women by 1.48, women who had other children before the current pregnancy by 1.35, those having oral health problems by 1.85, those who brush more than once a day by 1.51, those who visited the dentist routinely at least once a year by 1.92, and those who received oral health education by 2.82. The most cited reasons for not going to the dentist were no perceived dental problem (51.8%) and concerns re-

garding the safety of dental treatment during pregnancy (33.9%). **Discussion/Conclusion:** In spite of acceptable oral hygiene practices, a significant number of pregnant women (49.9%) experience dental problems. However, only a few women (17.4%) visit the dentist during their pregnancy. It is critical to design and implement strategic oral health programs for pregnant women in Dubai.

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Published by S. Karger AG, Basel

Introduction

Pregnancy is a physiological condition that brings about various changes in the oral cavity and other body changes. The oral changes include enamel erosion of teeth, caries, gingivitis, periodontitis, loose teeth, and oral pregnancy tumor [1]. Pregnant women may be more at risk for periodontal disease since higher estrogen and progesterone concentrations can induce hyperemia, edema, and bleeding in periodontal tissues [2, 3]. Studies have shown that 30–100% of pregnant women have gingivitis, the prevalence varying between the populations studied and their characteristics [2, 4].

Further, pregnant women are more prone to tooth decay due to the oral cavity's acidic environment, increased consumption of sugary diet, and carelessness toward oral health [1]. Nausea prevents them from observing proper oral hygiene practices. Frequent vomiting episodes in

pregnancy cause an acidic environment in the oral cavity leading to increased demineralization making teeth prone to caries [5].

There is evidence from various parts of the world that many pregnant women do not visit the dentist [6–8]. Previous studies in the Middle East region show that even though many pregnant women have dental problems, most do not visit a dentist [9, 10]. They face a significant risk by delaying treatment and consuming over-the-counter medication, which may be unsafe for their pregnancy [11].

Lack of awareness, time, finances, and dissuasion by health-care professionals, including dentists, are some of the various reasons identified as barriers to accessing dental care during pregnancy [8, 12, 13]. American College of Obstetricians and Gynecologists has stated that oral health is an integral part of preventive healthcare for pregnant women and their newborns [14]. The perinatal period is a “teachable moment” for oral healthcare and can potentially affect maternal and infant health. The odds of children having untreated caries doubled when the mother had untreated caries [15].

To our knowledge, there is only one previously published study in the United Arab Emirates (UAE) [16], which reported that 40% of pregnant women having oral problems did not visit a dentist. However, the patterns, contributing factors, and barriers to attending dental clinics have not been elucidated.

The aim of this study was to identify the oral health status, attitudes, and practices among a representative population of pregnant women in Dubai attending the primary health centers and their reasons for not treating oral health issues during pregnancy through the following questions:

1. How prevalent are dental problems among pregnant women in Dubai?
2. What are the oral hygiene habits and practices of pregnant women in Dubai?
3. What are the factors that may influence the attendance of these patients to access dental treatment?

Materials and Methods

The population in this study was pregnant women who were 18 years or older in their second or third trimester of pregnancy, who were attending the antenatal clinic in 12 primary health centers of Dubai Health Authority (DHA). Following approval from the Dubai Scientific Research Ethics Committee, the women were approached and asked to complete a self-administered questionnaire available in English and Arabic. The women who participated gave written informed consent for the same.

A previously developed and validated questionnaire [17] was used with appropriate modifications to adapt to the cultural sensitivity and understanding of the people of Dubai. After the initial construction of the survey questionnaire, 6 dentists reviewed it, and their suggestions for modifications were implemented, and a pilot study was conducted with a cohort of 30 pregnant women. The final questionnaire was made available in English and Arabic and was verified by back-translation.

The questionnaire included sections on demographic information, perceived oral health status, oral hygiene practices, and dental visits. Demographic data, including age, education, employment, parity, and pregnancy status, were collected. The perceived oral health status before and during pregnancy was also obtained regarding any gum problem, loose tooth, and toothache. Women were asked to assess their oral health status and report if they had any dental issues that affected their quality of life. The women were asked about their oral hygiene practices and their visit to the dentist before and during pregnancy. In case of not visiting the dentist, they were asked to select reasons for the same. The reasons included lack of perceived need, concerns regarding the safety of dental treatment during pregnancy, lack of time, dental treatment not being a priority, and being advised against dental care by a family member or health-care professional. They were also asked if any health-care professional had advised them regarding dental care during pregnancy.

The written informed consent was obtained from the participants after explaining the objectives and methodology of the study. The subjects were informed that their participation would be entirely voluntary and that their details would be kept confidential. All participants were handed an envelope containing a consent form with a brief description of the study’s purpose and objectives. If they agreed, the participant signed the consent, completed the questionnaire, sealed it in the envelope, and returned it.

Questionnaires were distributed to 1,500 pregnant women in primary health centers of DHA, located in different geographical zones in the Emirate of Dubai. Statistical analysis was done using Statistical Package for Social Sciences software version 20.0 (SPSS Inc, Chicago, IL, USA). The mean and the standard deviation were calculated for continuous variables, frequency, and percentage for categorical variables. As there were a small number of responses in some categories, few of the variables were regrouped to fulfill χ^2 test assumptions that no expected frequency should be <1 and not $>20\%$ of the expected frequencies should be <5 . The χ^2 test was used to find the association of dental visit of pregnant women with selected background variables of women, and odds ratio with 95% confidence interval was used to explain the association of these variables with the dental visit of pregnant women using simple logistic regression analysis. Multiple logistic regression was used to predict independent factors associated with the dental visit of pregnant women. For all statistical interpretations, $p < 0.05$ was considered the threshold for statistical significance.

Results

The response rate from the distributed questionnaires was 96.67%. Out of 1,500 forms distributed, 1,450 completed forms were collected, and the data were used to generate descriptive frequency tables.

Table 1. Participant demographics and perceived oral health status

Variable	N	%
Age, years		
18–25	344	23.7
26–35	944	65.1
36–45	162	11.2
Nationality		
UAE	816	56.3
Non-UAE	634	43.7
Education		
No schooling	21	1.4
Middle	85	5.9
High	426	29.4
Diploma	188	13.0
Graduate	623	43.0
Postgraduate	107	7.4
Employment		
Working	593	40.9
Not professionally employed	857	59.1
Parity		
First pregnancy	445	30.7
Has other children	1,005	69.3
Stage of pregnancy		
Second trimester	869	59.9
Third trimester	581	40.1
Current oral health status		
Excellent	329	22.7
Good	666	45.9
Average	300	20.7
Fair	111	7.7
Poor	44	3.0
Do you have any dental problem		
Yes	723	49.86
No	727	50.14
Bleeding or swollen gums		
Yes	471	32.5
No	979	67.5
One or more teeth felt loose		
Yes	131	9.0
No	1,319	91.0
Sensitivity or pain in one or more teeth		
Yes	427	29.4
No	1,023	70.6
In your current pregnancy, do your oral health problems affect your eating habits and/or overall health?		
Yes	300	20.7
No	1,150	79.3

The demographic characteristics of the participants, namely age, nationality, education, employment, parity, stage of pregnancy, and perceived oral health status, are seen in Table 1. The participants' age ranged from 18 to 43 years, with a mean age of 29.3 years ($SD \pm 5$). Around 49.9% of participants reported having at least one oral health problem during their pregnancy, while 20.7% ($N =$

Table 2. Frequency distribution of the participants according to oral hygiene habits and dental care visits before and during pregnancy

Characteristics	N	%
Frequency of toothbrushing		
Never	4	0.3
About once a week	6	0.4
A few times a week	21	1.4
Once a day	297	20.5
Twice a day	901	62.1
More than twice a day	221	15.2
Other oral hygiene aids		
Fluoride toothpaste	1,192	82.2
Dental floss	379	26.1
Mouthwash	599	41.3
Sugar-free chewing gum	419	28.9
Frequency of receipt of routine dental care prior to pregnancy		
Never	247	17.0
Less than once per year	160	11.0
Once per year	327	22.6
2 times a year	261	18.0
>2 times per year	111	7.7
Only when experiencing a problem	344	23.7
Last visit to a dentist		
<6 months	401	27.7
6–12 months	441	30.4
1–2 years	347	23.9
2–5 years	102	7.0
>5 years	76	5.2
Never	83	5.7
Dental visit in during current pregnancy		
Yes	253	17.4
UAE	169	20.7
Non-UAE	84	13.24
No	1,197	82.6
UAE	647	79.3
Non-UAE	550	86.76
Oral health education received		
Yes	344	23.7
No	1,106	76.3

300) reported that their dental problems affected their eating habits and overall health.

Table 2 shows the oral hygiene practices and dental visits reported by the women before and during pregnancy. Around 97.8% of participants brushed at least once a day, while 77.3% reported brushing at least twice a day. Around 82.2% of participants used fluoride-containing toothpaste. While they were not pregnant, 25.7% participants visited the dentist 2 times or more in a year. Over 22.6% of participants routinely visited the dentist once a year; 17% of participants reported never being to a dentist for routine treatment, and 23.7% went to the dentist only

Table 3. Association of a visit to a dentist during current pregnancy with selected variables

Characteristics	Visit to a dentist during current pregnancy		χ^2	<i>p</i> value	Odds (95% CI)
	yes	no			
Age					
18–25	52 (15.1)	292 (84.9)	2.3	0.317	–
26–35	175 (18.5)	769 (81.5)			–
36–45	26 (16)	136 (84)			–
Nationality					
UAE	169 (20.7)	647 (79.3)	13.79	<0.01	1.71 (1.29–2.28)
Non-UAE	84 (13.2)	550 (86.8)			1
Education					
Up to high school graduate	94 (17.7)	438 (82.3)	0.58	0.749	–
Diploma	36 (19.1)	152 (80.9)			–
Bachelors/masters degree	123 (16.8)	607 (83.2)			–
Professionally employed					
Yes	113 (19.1)	480 (80.9)	1.8	0.180	–
No	140 (16.3)	717 (83.7)			–
Parity					
Multi	189 (18.8)	816 (81.2)	4.19	0.041	1.38 (1.01–1.88)
Primi	64 (14.4)	381 (85.6)			1
Reported current oral health status					
Excellent/good	164 (16.5)	831 (83.5)	2.97	0.226	–
Average	55 (18.3)	245 (81.7)			–
Fair/poor	34 (21.9)	121 (78.1)			–
Dental problem during pregnancy					
Yes	158 (21.9)	565 (78.1)	19.43	<0.01	1.86 (1.41–2.46)
No	95 (13.1)	632 (86.9)			1
Brushing habit					
Up to once a day	38 (11.6)	290 (88.4)	17.41	<0.01	1
2 times a day	159 (17.6)	742 (82.4)			1.58 (1.12–2.24)
>2 times a day	56 (25.3)	165 (74.7)			2.59 (1.65–4.08)
Oral hygiene products use					
Yes	239 (17.8)	1,106 (82.2)	1.33	0.249	–
No	14 (13.3)	91 (86.7)			–
Frequency of receipt of routine dental care prior to pregnancy					
Never/rare	88 (11.7)	663 (88.3)	35.52	<0.01	1
One or more times a year	165 (23.6)	534 (76.4)			2.33 (1.76–3.09)
Oral health education received					
Yes	100 (29.1)	244 (70.9)	42.29	<0.01	2.55 (1.91–3.41)
No	153 (13.8)	953 (86.2)			1

CI, confidence interval.

to treat a problem. Since becoming pregnant, 17.4% of women visited a dentist, while 82.6% did not make any visit to the dentist. Women of UAE nationality showed a slightly higher attendance for dental treatment than that of non-nationals. Around 23.7% of participants had received some information about oral healthcare during pregnancy from a health-care professional.

Table 3 shows the distribution of the mothers' profile in the group who visited the dentist compared with those who did not. The factors associated with the mothers' vis-

it to the dentist were identified by simple logistic regression analysis. Among the women of UAE nationality, 20.7% visited the dental clinic during pregnancy compared to 13.2% of non-UAE women. The χ^2 test ($p < 0.01$) shows that the dental visit of pregnant women is significantly associated with the nationality of the women. Women from UAE have more chance to visit a dentist during pregnancy with an odds of 1.71 than non-UAE women. Regarding parity, 18.8% of women who have children previously visited the dentist compared to 14.4%

Table 4. Independent factors associated with the dental visit of pregnant women by multiple logistic regression

Characteristics	B	SE	<i>p</i> value	Odds (95% CI)
Nationality (non-UAE [®])				
UAE	0.39	0.16	0.013	1.48 (1.09–2.02)
Parity (primi [®])				
Multi	0.30	0.16	0.068	1.35 (0.98–1.87)
Dental problem during pregnancy (no [®])				
Yes	0.61	0.17	0.000	1.85 (1.32–2.59)
Brushing habit (up to once a day [®])				
2 times a day	0.41	0.20	0.042	1.51 (1.02–2.24)
>2 times a day	0.73	0.25	0.003	2.07 (1.28–3.36)
Previous visit to dentist (never/rare [®])				
Once or more a year	0.65	0.15	0.000	1.92 (1.42–2.59)
Oral health education received (no [®])				
Yes	1.04	0.16	0.000	2.82 (2.07–3.82)

SE, standard error; CI, confidence interval.

of women who were pregnant with their first child. Therefore, the dental visit of pregnant women is significantly associated with parity ($p = 0.041$). Women who had children before the current pregnancy had more chance to visit the dentist than primi women, with an odds of 1.38. There is a significant association ($p < 0.01$) between women who reported experiencing a dental problem during pregnancy and their dental visit. Women who reported experiencing a dental issue have more chance to visit a dentist during pregnancy with an odds of 1.86 as than those who did not report any dental problem. There is a significant association ($p < 0.01$) between the brushing habit of women and their dental visit. Women who brushed 2 times a day or more had more chance to visit the dentist than those who brushed up to once a day with an odds of 1.58 and 2.59, respectively. Frequency of receipt of routine dental care before pregnancy is significantly associated ($p < 0.01$) with dental visits during pregnancy. Those women who routinely visited the dentist at least once a year have more chance to visit the dentist than others, with an odds of 2.33. There is a significant association ($p < 0.01$) between receiving oral health education during pregnancy and dental visit. Women who had received oral health education had more chance of visiting the dentist than others, with an odds of 2.55.

Table 4 shows the independent factors associated with the dental visit of pregnant women by multiple logistic regression analysis. A dental visit during pregnancy was taken as a dependent variable, and variables that have $p < 0.15$ at bivariate analysis were taken as independent variables. The independent variables used for multiple logistic regression are nationality, parity, dental problem during pregnancy, brushing habit, routine dental visit, and

oral health education received during pregnancy. The independent factors elicited from the multiple logistic regression are nationality, parity, oral health problems, brushing habits, routine dental visit, and oral health education received. The dental visit of pregnant women is significantly associated with nationality of the women ($p = 0.013$). UAE national women have more chance to visit a dentist during pregnancy with an odds of 1.48 than non-UAE women. The dental visit of pregnant women is significantly associated with parity ($p = 0.068$). Women who had children previously had more chance to visit the dentist than primi women, with an odds of 1.35. There is a significant association ($p < 0.01$) between women who reported experiencing a dental problem during pregnancy and their dental visit. Women who reported experiencing a dental issue have more chance to visit a dentist during pregnancy with an odds of 1.85 than those who did not report any dental problem. There is a significant association ($p = 0.042$) between the brushing habit of women and their dental visit. Women who brushed 2 times a day had more chance to visit the dentist than those who brushed up to once a day with an odds of 1.51. Frequency of receipt of routine dental care prior to pregnancy is significantly associated ($p < 0.01$) with dental visits during pregnancy. Those women who routinely visited the dentist at least once a year have more chance to visit the dentist than others, with an odds of 1.92. There is a significant association ($p < 0.01$) between receiving oral health education during pregnancy and dental visit. Women who had received oral health education had more chance of visiting the dentist than the others, with an odds of 2.82.

Figure 1 shows the distribution of the study population according to the barriers to dental visits during pregnan-

Fig. 1. Bar graph showing percentage distribution of the sample according to barriers for visiting the dentist.

cy. In general, the most cited reason for not going to a dentist was no perceived dental problem (51.8%). Around 33.9% of participants felt it was not safe to undergo dental treatment during pregnancy. Among the 300 women who reported having problems that affect their daily routine, 222 (74%) did not visit the dentist. For these women, the most cited reason for nonattendance was that it was unsafe to get dental treatment during pregnancy (59.9%, $n = 133$), followed by lack of time to go to a dentist (38.7%, $n = 86$).

Discussion

The World Health Organization Global Oral Health Policy emphasizes that oral health is a determining factor for the quality of life [18]. Dubai is the most populous city and is one of the 7 emirates in the UAE [19]. Each emirate governs its health-care standards according to its internal laws. DHA oversees the health sector of the Emirate of Dubai, providing services through primary health centers spread throughout the emirate.

The Oral and Dental care, Program 5 of the Dubai Health Strategy 2016–2021 seeks to improve oral health outcomes and ensure that all individuals have access to

high-quality treatments and effective prevention programs for dental care [20]. Pregnant women are part of the population whose oral health is frequently neglected [14]. Therefore, to develop and implement effective programs to improve the oral health of pregnant women in Dubai, it is essential to assess the current practices and attitudes to seeking dental treatment, specifically among the residents of Dubai. To our knowledge, this study, for the first time, aimed to identify the oral health problems, practices, attitudes of pregnant women across Dubai, factors affecting their dental service utilization, and barriers to the same.

Oral Health Status and Practices

Toothbrushing habits of pregnant women in Dubai were acceptable, and many used fluoridated toothpaste. This finding is comparable to a previous study on the UAE population [16] and better than the findings from Kuwait [21]. However, very few women flossed regularly, which showed a lack of understanding of the importance of flossing as part of oral hygiene. Almost half the women reported having a dental problem, the most common one being “gum problems”. Around 20% reported having dental problems severe enough to affect their daily life and were more likely to visit the dentist, as can be ex-

pected. Employment and the education level did not have a significant influence on the dental visit. This is similar to findings from other studies [6, 8]. Perceived oral health status was also not a significant predictor in this study, similar to a study in Kuwait [21] and Malaysia [8].

Dental Visits of Pregnant Women

When they were not pregnant, almost half the women frequented the dentist at least once a year. But since becoming pregnant, out of the total number of pregnant women surveyed, only 17.4% had been to a dentist. This number is far less than the previous study of the UAE population [16], which reported that more than half the women had visited the dentist during their pregnancy but is similar to other reported studies in the region. In Riyadh, 22% of pregnant women [9] and 14% of Turkish women [10] had been to a dentist. Further, it was seen that regardless of dental problems, pregnant women who otherwise maintained regular visits to a dentist were more likely to visit the dentist during pregnancy. Some other studies also report similar findings [9, 17, 22], which indicates that routine dental care is a strong predictor of whether a woman visits the dentist during her pregnancy.

Barriers to Accessing Dental Care during Pregnancy

Several barriers to accessing dental care during pregnancy have been reported previously. In our study, the lack of perceived need, followed by the fear of the safety of dental treatment, was the most reported one. Financial barriers did not pose a significant barrier for dental treatment as in Dubai. This may be so because all UAE nationals have full financial coverage for their dental treatment, and most of the non-UAE expatriates have some dental insurance coverage. This finding is similar to other studies in the Middle East region [9, 10]. However, in contrast, some studies in other parts of the world have shown financial barriers to be a significant contributing factor [6, 12]. The financial coverage for dental treatment for UAE nationals is probably the reason why nationality was seen to be a significant predictor in a dental visit during pregnancy.

A key finding from this study is that among the 300 women who reported having problems that affect their daily routine, 222 did not visit the dentist. The main barrier reported by this group of women was fear of the safety of dental treatment. This implies that even though they had dental problems, the women did not perceive oral healthcare as a pressing need and would probably delay

the dental visit to post their delivery. This is a concern to be addressed as these women may be experiencing a quality of life that is less than optimum. Untreated dental problems may lead to irreparable damage to the periodontium and tooth structures and may have adverse effects on the child [23, 24]. This lack of urgency to seek dental treatment is enhanced by the fact that less than a quarter (23.7%) of the women received any counseling or advice about their oral health during pregnancy. This seems to be a global pattern, as in a study across ten states of the USA, it was noted that 59% of pregnant women did not receive oral health counseling [25], and in Sydney, only 10% received any oral health promotion [26]. A significant finding is that women who received oral health education were more likely to visit the dentist during pregnancy. This is consistent with the findings of some other studies [8, 12].

Dental treatment during pregnancy is safe and should not be delayed [27]. To correct the misconception about the fear of dental treatment in pregnancy, the dental professional, along with other health-care providers like the obstetrician, gynecologist, and midwives, must work together to pass on important messages about the importance of dental care and good oral hygiene. The provision of oral health education to all antenatal mothers should be made mandatory, and the need for routine dental visits both before and during pregnancy must be emphasized.

Limitations and Strengths

The limitations of the study include the possible bias associated with self-reported information obtained from the self-administered questionnaire. A clinical examination was not conducted to confirm the self-reported oral health problems, and so, the prevalence of problems might be even higher. This study's strength is that it focuses on the emirate of Dubai, with the sample population spread across the primary health centers covering the various geographical zones. Therefore, based on this study's results, targeted efforts to promote oral healthcare and its awareness during pregnancy can be implemented through Emirate-wide policies and strategies.

Conclusion

A significant number of pregnant women (49.9%) in Dubai have oral health problems. Toothbrushing habits of pregnant women in Dubai were acceptable, and many used fluoridated toothpaste. However, dental treatment

utilization during pregnancy is low. Fear of the safety of dental treatment and lack of perceived need were the significant reasons causing women to avoid visiting the dentist. Routine dental visits, oral health education, brushing habits, oral health problems, nationality, and parity were significant predictors for a dental visit during pregnancy. There is a need for formulating and implementing targeted oral health programs for pregnant women.

Acknowledgement

The authors would like to thank Dr. Nadia Saleh and Dr. Khaled Farghali for reviewing the study proposal. A special note of thanks to Ms. Hend Mohd Sultan and the team of antenatal nurses of DHA for their support.

Statement of Ethics

This study was approved by the Dubai Scientific Research Ethics Committee (DSREC-02/2018-03), and written informed consent was obtained from all the participants.

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Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Funding Sources

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Author Contributions

S.J. contributed to conceptualization, methodology, investigation, data curation, writing—original draft preparation, and visualization. H.S.A. contributed to supervision, writing—reviewing, and editing.

Data Availability Statement

The research raw data are not publicly available due to ethical reasons. The data are available with the corresponding author and can be made available upon receiving a formal and reasonable request.

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