



ORIGINAL ARTICLE

Assessing Expectant Mothers' Knowledge and Beliefs about Oral Healthcare During Infancy and Pregnancy: A Cross Sectional Survey in Saudi Arabia

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Academic Editors: Alessandro Leite Cavalcanti and Wilton Wilney Nascimento Padilha

Received: 08 March 2018 / Accepted: 25 May 2018 / Published: 04 June 2018

Abstract

Objective: To evaluate expectant mothers' knowledge and beliefs on oral healthcare of infants. It also aimed at exploring their knowledge on oral health care during pregnancy and the possible relationship between oral health and adverse pregnancy outcomes.

Material and Methods: A cross-sectional, questionnaire-based survey was conducted among expectant mothers attending antenatal clinics in Al Madinah, Saudi Arabia in summer, 2017. Questions collected data on sociodemographic characteristics of the study sample as well as basic knowledge on oral healthcare during pregnancy and infancy. There were also questions on knowledge about adverse pregnancy outcomes that may be associated with poor oral health. **Results:** A convenient sample of 360 pregnant women participated in the study. A percentage of 79.7% showed a good level of knowledge in oral healthcare of infants while a percentage of 8.9% only showed a good level of knowledge in oral healthcare during pregnancy and pregnancy outcomes. Education level and employment status were significantly associated with the good level of knowledge in oral healthcare of infants ($p=0.000$, and 0.002 respectively). **Conclusion:** Most of expectant mothers, particularly educated and employed ones, have good knowledge on oral healthcare of infants, however, the majority lacked sufficient knowledge on pregnancy outcomes and oral healthcare during pregnancy.

Keywords: Infant; Pregnancy; Oral Health; Pregnancy Outcome.

Introduction

Oral healthcare (OHC) during pregnancy and infancy is considered an essential component of general health and well-being. Expectant mothers are supposed to acquire a satisfactory level of knowledge about relevant aspects of health preferably before pregnancy. Within this context they are also expected to gain the sufficient knowledge of OHC of their children from infancy throughout adolescence considering their role as the primary caregivers. This issue assumes a high level of significance in cultures that encourage women to have many children and establish large families. In the Arabic culture in general, and Saudi culture in particular, women are encouraged to give birth five times or more [1]. This fact makes women more prone to the adverse oral health outcomes associated with pregnancy, during which, there is a higher susceptibility to poor oral health [2], due to hormonal changes and increased susceptibility to gingivitis [3]. They are also susceptible to dental caries because of increased acidity of saliva, sugary dietary cravings and inadequate oral healthcare [4].

The poor maternal oral health can negatively impact both maternal and fetal health and wellbeing [5]. So far, three types of adverse pregnancy outcomes were identified to be directly related to poor oral health during pregnancy; preeclampsia, low birth weight and preterm birth [6-8].

It is estimated that pregnant women with periodontitis are six times more likely to have low birth weight children than those without periodontitis [9]. While preeclampsia is associated with high morbidity and mortality during pregnancy [10], low birth weight and preterm birth have a direct effect on the newborn health. On the other hand, expectant mothers should have sufficient knowledge on oral health aspects of their children particularly during infancy, an important period of life for development of sound oral health habits and establishing the basis for good oral health attitudes and practices.

Early childhood caries, caries affecting primary teeth in children younger than 6 years, is considered a public health problem in developing countries [11]. For instance, a prevalence of 62-73% of early childhood caries was found in Saudi Arabia [12, 13], compared to a prevalence of 1-12% in developed countries [14]. This type of caries, and dental caries in general, has been considered a family-related disease in which caries-related bacteria are transmitted vertically from mother to child and horizontally between siblings [15]. Furthermore, the parents' lifestyle has a strong influence on the care for their child regarding dental awareness, dental hygiene and food habits [15,16].

Previous research conducted in Al Madinah, the second holy city in Islam after Makka, reported disappointing results of oral health condition among young females with a high prevalence of alveolar bone loss and dental caries [17,18], and inadequate oral hygiene practices [19].

On the other hand, research conducted in Saudi Arabia in recent years has shown variable results regarding oral health awareness among pregnant women [20,21], indicating an urgent need to conduct similar studies in Al-Madinah taking into consideration its religious and cultural uniqueness.

This study was conducted among expectant mothers attending antenatal clinics to evaluate their knowledge and beliefs on OHC of infants, and OHC during pregnancy. It also aimed at exploring their knowledge on the possible relationship between oral health and adverse pregnancy outcomes.

Material and Methods

Study Design and Participants

This was a cross-sectional, questionnaire-based survey. The following inclusion criteria were used: pregnant women aged ≥ 18 years, attending the antenatal clinics of Ministry of Health hospitals and centers in Al Madinah, and who can read and understand Arabic language. Exclusion criteria were pregnant women aged less than 18 years.

A convenient sample of pregnant women were approached during their routine visits to the antenatal centers and the study was explained to them. Informed consent was obtained prior to handing them a smart phone to complete the questionnaire with the help and guidance of researchers SB, RG, RH, and AA. Participant recruitment and completion of questionnaire was performed during March-May, 2017.

Sample size determination was based on the estimated number of pregnant women visiting the antenatal clinics of Ministry of Health hospitals and centers in Al Madinah area monthly (2000 patients), and period of data collection (3 months). By using Epidemiological software Epi Info™ (CDC, Centers for Disease Control, Atlanta, USA) a sample of 361 was found to provide 95% confidence level at expected frequency of 50% (oral health awareness level) [6], and confidence limit of 5%, based on a design effect (1.0), and one cluster.

Data Collection

The questionnaire was designed by researchers OA, SM, SJ and ND. It was a 21-item questionnaire that included 3 sections of close-ended questions: a section on personal data of age, occupation (employed or unemployed), educational level (illiterate, school, university or postgraduate), and nationality (Saudi or non-Saudi); 9 statements to evaluate knowledge about OHC in infants (answers were in the form of: agree, disagree or don't know); 8 statements to evaluate beliefs about OHC during pregnancy and pregnancy outcomes (answers were in the form of: agree, disagree, or don't know). The questionnaire was written in Arabic, entered in Google forms, and a link was created. Validation was performed by distributing the questionnaire to a number of 10 pregnant ladies on two occasions separated by one week. Answers were checked for consistency, and questions were modified when necessary to ensure their clarity.

Ethical Aspects

Ethical approval was obtained from Taibah University College of Dentistry Research Ethics Committee (TUCDREC/20170309/BinSaad).

Statistical Analysis

Statistical analysis was performed using IBM SPSS Statistics for Windows version 21 (IBM Corp., Armonk, NY, USA) to find descriptives and frequencies and also to find the significance of associations between various socio-demographic factors and total scores on responses to oral health awareness questions.

Knowledge was evaluated by scoring responses. Scores were calculated as follows: the first section was composed of 9 questions about knowledge on OHC of infants. Responses to questions were in the form of: agree, disagree and “don’t know”. For statistical analysis the incorrect answers and “don’t know” responses were given a zero score, while correct answers were given a score of “1”. Total of scores was evaluated out of 9 as follows: poor= 0-4, good= 5-9. The second section was composed of 8 questions on pregnancy outcomes and OHC during pregnancy. Responses were also in the form of agree, disagree and “don’t know”. For statistical analysis the incorrect answers and “don’t know” responses were given a zero score, while correct answers were given a score of “1”. Total of scores was evaluated out of 8 as follows: poor=0-4, and good= 5-8. Addition of levels of knowledge in both sections was then done to assess total knowledge level and this produced 3 levels as follows: good, fair, and poor.

Results

A total of 360 women participated in the study. Their mean age was 30.08 years (range= 18-52 years, SD=5.96). Socio-demographic characteristics of age groups, educational level, occupation and nationality of the study sample are presented in Table 1.

Table 1. Socio-demographic characteristics of the study sample including age, educational level, occupation and nationality.

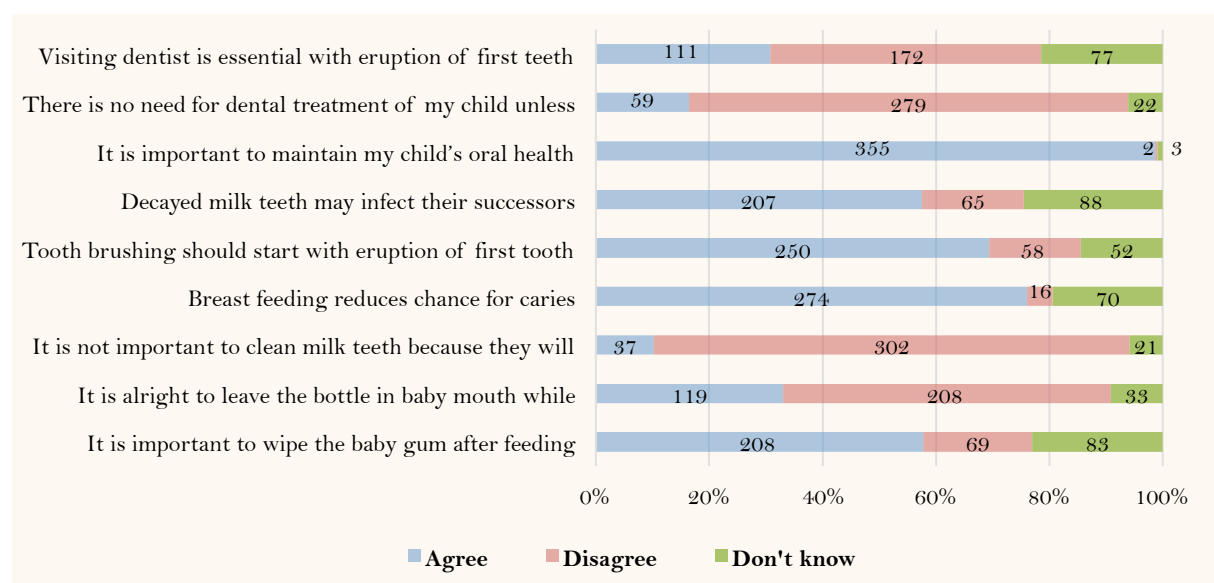
Socio-Demographic Characteristics	N	%
Age Groups (years)		
18-29	183	50.8
30-40	165	45.8
41-52	12	3.4
Educational Level		
Illiterate	3	0.8
School	129	35.8
University	203	56.4
Postgraduate	25	7.0
Occupation		
Employed	103	28.6
Unemployed	257	71.4
Nationality		
Saudi	318	88.3
Non-Saudi	42	11.7

Correct answers as well as number and percentage of participants who provided correct answers in both sections of OHC are presented in Table 2.

Table 2. Questionnaire items pertaining to knowledge about OHC of infants, and knowledge about OHC during pregnancy and relation between oral health and adverse pregnancy outcomes.

Oral Healthcare Infants	Correct Answer	N	%
It is important to maintain my child's oral health	Agree	355	98.6
It is not important to clean milk teeth because they will be replaced	Disagree	302	83.9
There is no need for dental treatment of my child unless there is pain	Disagree	279	77.5
Breast feeding reduces chance for caries	Agree	274	76.1
Tooth brushing should start with eruption of first tooth	Agree	250	69.4
It is important to wipe the baby gum after feeding	Agree	208	57.8
It is alright to leave the bottle in baby mouth while sleeping	Disagree	208	57.8
Decayed milk teeth may infect their successors	Agree	207	57.5
Visiting dentist is essential with eruption of first teeth	Agree	111	30.8
Oral Healthcare Pregnancy			
Dental radiography is safe during pregnancy	Agree	250	69.4
Pregnant women are more susceptible to gingivitis than other women	Agree	231	64.2
Pregnant women are more susceptible to caries than other women	Agree	173	48.1
Pregnant women can lose teeth only because of pregnancy	Disagree	95	26.4
Visiting the dentist during pregnancy for check-up and scaling is safe	Agree	77	21.4
Periodontal disease in pregnant women could lead to pre eclampsia	Agree	45	12.5
Periodontal disease in pregnant women could lead to low birth weight	Agree	41	11.4
Periodontal disease in pregnant women could lead to preterm birth	Agree	31	8.6

Most participants provided correct answers, and showed a good level of knowledge on OHC in infants, and only a small minority responded with “don’t know” in most questions (Figure 1).

**Figure 1. Distribution of responses to each statement on OHC of infants.**

Responses to questions on OHC during pregnancy and the relationship between pregnancy outcomes and oral health are shown in Figure 2.

A total of 287 (79.7%) of participants showed a good level of knowledge on OHC in infants, while only 23 (8.8%) showed a good level of knowledge on OHC in pregnancy and pregnancy outcomes, and 29 (8.1%) showed a good level of overall knowledge. Detailed frequencies and percentages of responses in the two aspects of OHC knowledge and overall knowledge are shown in

Table 3. There was a statistically significant association between higher education level and knowledge scores in OHC of infants, as well as overall knowledge scores ($p=0.000$). There was also a statistically significant association between “employed” status and knowledge scores in OHC of infants, as well as overall knowledge scores ($p=0.002$ and 0.005 respectively). However, none of the socio-demographic factors had a statistically significant association with knowledge scores of OHC in pregnancy ($p>0.05$).

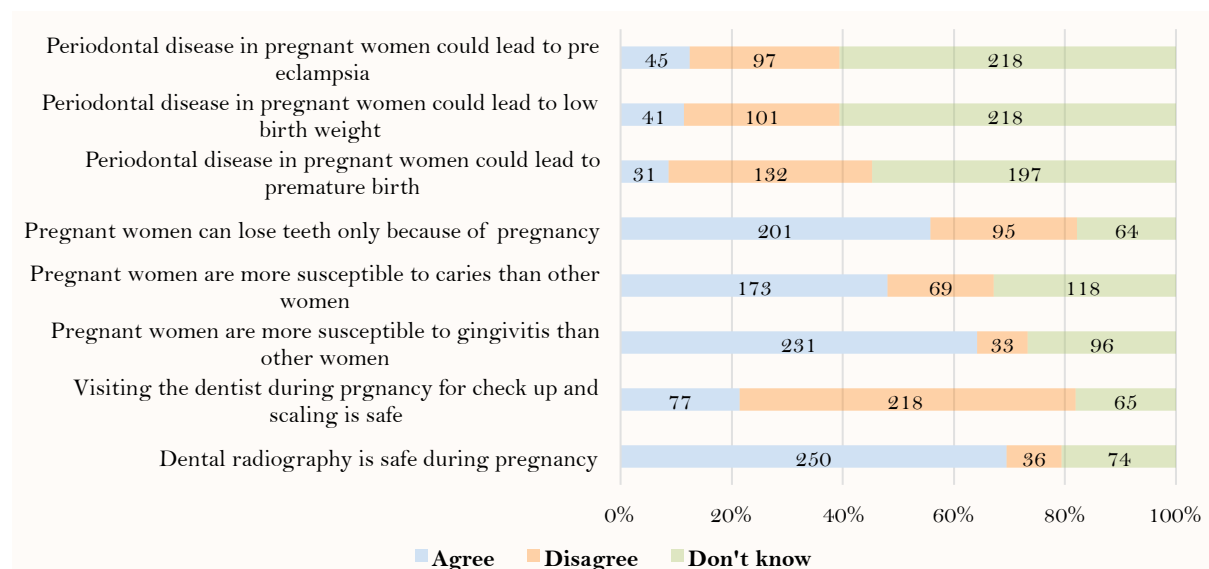


Figure 2. Distribution of responses of participants to statements on OHC during pregnancy and relation between oral health and pregnancy outcomes.

Table 3. Socio-demographic characteristics and knowledge scores for OHC in infants, OHC in pregnancy and overall knowledge.

Pregnancy and overall knowledge.							
Socio-Demographic	OHC (Infants)		OHC (Pregnancy)		Overall Knowledge		
Factors	Poor N (%)	Good N (%)	Poor N (%)	Good N (%)	Poor N (%)	Fair N (%)	Good N (%)
Age Groups							
18-29	39 (21.3)	144 (78.7)	162 (88.5)	21 (11.5)	38 (20.8)	125 (68.3)	20 (10.9)
30-40	32 (19.4)	133 (80.6)	155 (93.9)	10 (6.1)	30 (18.2)	127 (77.0)	8 (4.8)
41-52	2 (16.7)	10 (83.3)	11 (91.7)	1 (8.3)	2 (16.7)	9 (75.0)	1 (8.3)
p-value	0.862		0.207		0.264		
Education							
Illiterate	1 (33.3)	2 (66.7)	3 (100)	0.0	1 (33.3)	2 (66.7)	0.0
School	45 (34.9)	84 (65.1)	123 (95.3)	6 (4.7)	44 (34.1)	80 (62.0)	5 (3.9)
University	26 (12.8)	177 (87.2)	180 (88.7)	23 (11.3)	25 (12.3)	156 (76.8)	22 (10.8)
Postgraduate	1 (4.0)	24 (96.0)	22 (88.0)	3 (12.0)	0	23 (92.0)	2 (8.0)
p-value	0.000*		0.176		0.000*		
Occupation							
Employed	10 (9.7)	93 (90.3)	92 (89.3)	11 (10.7)	9 (8.7)	84 (81.6)	10 (9.7)
Unemployed	63 (24.5)	194 (75.5)	236 (91.8)	21 (8.2)	61 (23.7)	177 (68.9)	19 (7.4)
p-value	0.002*		0.450		0.005*		
Nationality							
Saudi	61 (19.2)	257 (80.8)	287 (90.3)	31 (9.7)	58 (18.2)	232 (73.0)	28 (8.8)
Non-Saudi	12 (28.6)	30 (71.4)	41 (97.6)	1 (2.4)	12 (28.6)	29 (69.0)	1 (2.4)
p-value	0.155		0.115		0.134		

*Statistically significant association.

Discussion

This study investigated knowledge and beliefs that expectant mothers have on OHC in two critical periods of life: infancy and pregnancy.

The first aspect investigated in this study was expectant mothers' knowledge about OHC in infants. Most participants provided correct answers to questions on that aspect, and only a small minority responded with "don't know" in most questions. This indicated that women are well-informed about OHC in infants. However, there was one statement that was correctly answered by only a minority of participants (30.8%), and it was "visiting the dentist is essential with eruption of first teeth". This may arise from the fact that mothers think that dental caries affect their children later in life, which precludes the need for visiting the dentist as early as eruption of first teeth.

Unfortunately, the role of dentist in developing countries is still stereotyped as a practitioner who is responsible for providing dental treatment services only disregarding their role in preventive oral health activities [22], and underestimating the importance of periodic dental visits that contribute to the prevention and control of many oral infections [23].

Dentists can perform many preventive oral health care activities for vulnerable populations like children, adolescents and young women, and they play a very important role in tobacco cessation and oral cancer screening [24]. Within this context they can provide parents with advice regarding prevention of early childhood caries by practicing oral hygiene and avoiding prolonged breast-feeding and nocturnal bottle-feeding. Prevention and treatment of early childhood caries is important since children with carious primary teeth have increased risk of caries in permanent dentition [25], making it important to implement oral hygiene measures early in life and no later than the time of eruption of the first primary tooth. There has been some debate lately about the association between breast-feeding and early childhood caries due to the content of sugars in breast milk [26]. In a systematic review, it was shown that breastfeeding is more effective than bottle-feeding at preventing early childhood caries, it was recommended as the exclusive feeding method for up to 6 months, followed by complementary breastfeeding for up to two years of age [27].

In this sample of expectant mothers, education and employment had a strong association with high knowledge scores in OHC of infants. This study showed that education is an essential factor in providing knowledge to women regarding OHC of their children. Indeed, recent studies in this region have shown the positive influence of education and employment on health behaviors among women [28].

Saudi Arabia has a high literacy rate among women as UNESCO statistics show that female adult literacy rate for 15 years and older is 91.3 [29]. In this sample, approximately one third of participants had school-level of education, which is considered a low level in a country like Saudi Arabia, and unacceptable in a holy city like Al Madinah since this contradicts the teachings of Islam among a population who should be more aware and conscientious when it comes to practical application of Prophet Mohamad's Advice. Seeking knowledge and education is a fundamental part of Muslim culture for both genders.

In contrary to beliefs of some families, women's education in Islam is not at all contradictory to concepts such as chastity and dignity, which are highly appreciated in Islam [30]. Additionally, the official stand in Saudi Arabia is to encourage education in both genders equally. Saudi students are privileged in a number of ways. For a start, there are no tuition fees in school as well as university. Furthermore, all students excepting those in parallel university programs are entitled to a monthly payment of SAR 800-1000 (equivalent to \$260) regardless of gender. It seems though that the low level of education could be related to family factors like parents' opposition, an issue that requires further investigation. Another socio-demographic characteristic that showed a significant association with high knowledge scores in the aspect of OHC of infants was employment. Saudi women are encouraged to work in many types of jobs including those that were in the past exclusively occupied by men. Employed women are expectedly better educated than unemployed women, and they are supposed to participate in continuing education courses as part of job promotion activities.

The other aspect that was investigated in this study was women's knowledge and beliefs about OHC in pregnancy and relationship between OH and pregnancy outcomes, and in this section participants performed poorly. Interestingly most participants disagreed with the statement that "consulting the dentist during pregnancy for check-up and scaling is safe". In fact, many dental procedures are safe and can be performed during pregnancy including taking radiographs, scaling, fillings, crowns, extraction, root canal treatment, local anesthetic injections and prescribing medications [31]. This poor knowledge was confirmed by the finding that most of the sample did not know that periodontal disease is linked to adverse pregnancy outcomes of pre-eclampsia, preterm birth and low birth weight. This finding has an important implication for this sample of patients.

A recent study conducted in Al Madinah among young women found that 17% of these women have alveolar bone loss indicating periodontal disease [17]. Although most participants who showed good knowledge in this aspect were employed and with higher education, none of the socio-demographic factors had a statistically significant association with knowledge scores aspect confirming that poor knowledge and incorrect beliefs about OHC in pregnancy and adverse pregnancy outcomes prevailed in this sample regardless of their socio-demographic background.

The results of this study pose an important question: why do expectant mothers have good knowledge on OHC of infants, however, they lack sufficient awareness on their OHC during pregnancy? Since 218 participants (61% of the sample) believe that a dental check-up during pregnancy is not safe, one can assume that the dominant attitude among this sample is to avoid visiting the dentist even for check-up. This suggests that obstetric care providers have an essential role to play since they may be the only healthcare professionals that pregnant women consult during pregnancy. Consequently, they can be involved in motivating pregnant women regarding OHC, and they can initiate referrals to dental practitioners for the purpose of screening and providing the preventive as well as the necessary therapeutic dental measures. Fortunately, the past decade has witnessed the development of comprehensive, evidence-based guidelines on dental care during

pregnancy that were directed to both dental and obstetric care professionals [32]. Furthermore, a coordinated interdisciplinary approach was shown to be successful in educating women and healthcare providers about oral health and pregnancy, and increasing referral of women for dental care [31].

This study has limitations. Evaluation of knowledge and beliefs on OHC of infants and during pregnancy may not reflect the actual oral health status of participants particularly that oral hygiene practices were not evaluated. This study relied on self-perceived data, which could be a source of bias. On the other hand, this study recruited a representative sample of pregnant women, who were mostly Saudi to represent the Saudi community. Antenatal clinics participating in the survey belonged to Ministry of Health, and this should provide homogeneity of the sample in different aspects.

Conclusion

Expectant mothers, particularly educated and employed ones, have a good knowledge on OHC in infants. They also have a poor knowledge on OHC in pregnancy and pregnancy outcomes regardless their socio-demographic characteristics.

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