





# Oral Health Awareness and Oral Hygiene Practices among Married Women of Al-Ahsa, Saudi Arabia

Syed Akhtar Hussain Bokhari<sup>1</sup> Suresh Sanikommu<sup>1</sup> Abdullah BuHulayqah<sup>1</sup> Hussain Al-Momen<sup>1</sup>  
Abdullah Al-Zuriq<sup>1</sup> Zohaib Khurshid<sup>2</sup>

<sup>1</sup> Department of Preventive Dental Sciences, College of Dentistry, King Faisal University, Al-Ahsa, Saudi Arabia

<sup>2</sup> Department of Prosthodontics and Implantology, College of Dentistry, King Faisal University, Al-Ahsa, Saudi Arabia

**Address for correspondence** Syed Akhtar Hussain Bokhari, PhD, Department of Preventive Dental Sciences, College of Dentistry, King Faisal University, Al-Ahsa 31982, Saudi Arabia (e-mail: sbokhari@kfu.edu.sa).

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## Abstract

**Objective** Awareness of mothers about oral health and their oral hygiene practices may benefit both maternal and infant oral health. This study assessed the oral health awareness and oral hygiene practices among married females.

**Materials and Methods** A cross-sectional study was conducted on 430 females using a self-administered close-ended questionnaire that was distributed through WhatsApp application. Chi-squared test and *t*-test were applied with significance level of *p*-value less than or equal to 0.05.

**Results** Three hundred and fifty-six females responded to the survey. Ninety percent women brushed their teeth daily, 52% used dental floss, and 58% used mouthwash. Seventy-nine percent patients visited a dentist when had a dental problem. Females more than or equal 75% think that dentist visit is important or consider it safe and 34% had visited the dentist during pregnancy. Sixty-eight percent women think that incidence of oral disease increases during pregnancy, and 42% agreed that oral disease affect the baby's oral health. Sixty-seven percent were aware that women could develop pregnancy gingivitis and 8% think that poor oral health can lead to birth of premature baby. Mothers with less than or equal to 10 years of married life have shown significantly ( $\leq 0.04$ ) higher knowledge and good oral hygiene practices than other older mothers. Regression analysis showed a significant ( $p \leq 0.035$ ) relationship between incidence of oral disease in pregnancy with married life years; effect of oral disease on baby' health with age and occupation; use of dental floss with income and living area; knowledge of pregnancy gingivitis with number of children; effect of bad oral hygiene on pregnancy outcome with income; and dentist visit during pregnancy with married life years.

**Conclusion** Females with higher education, less years of married life, and higher number of children were better aware of oral health and oral hygiene practices and its effect on their baby's oral health.

## Keywords

- ▶ oral health
- ▶ oral hygiene practices
- ▶ women
- ▶ children
- ▶ married life

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## Introduction

Knowledge and understanding on oral health can help people choose a healthy lifestyle. Oral health status of married women can affect not only their pregnancy outcomes but also the oral health status of their infants.<sup>1</sup> Sound oral health, prior to and during pregnancy, plays a significant role in improving overall health and quality of life of women. It is recognized that physiological changes during stages like puberty, pregnancy, and menopause have a significant impact on women's overall health.<sup>2</sup> According to research,<sup>3,4</sup> providing preventative dental treatment to expectant mothers can lower the frequency and severity of oral illnesses and it has a positive impact on women's oral health, well-being, and quality of life. Aiming to improve pregnant women's knowledge about oral hygiene will, in turn, improve the oral health of infants and children.<sup>5</sup> However, evidence points to the fact that not many women seek or receive oral care nor they receive preventive services and education during pregnancy.<sup>6</sup> Pregnant women often delay or avoid obtaining dental care because of cultural factors such as taboos, personal factors such as fear, and barriers to oral care such as lack of availability, accessibility, and affordability.<sup>7-9</sup>

It is recommended to incorporate preventive dental health education and services into the standard prenatal care.<sup>10</sup> Lack of awareness on the consequences of poor oral health during pregnancy prevents pregnant women from adopting healthy habits and behaviors.<sup>11</sup> It is very important for oral health care practitioners to interact with expecting mothers and favorably influence their oral health behavior to prevent unfavorable pregnancy outcomes. However, such efforts should not be based on top-down approach where decisions are made without considering the people's perceptions. It is important for such initiatives to assess the knowledge and oral health practices in different population groups to tailor the oral health programs for the specific requirements of those groups.<sup>12</sup> Oral health is increasingly being viewed as an essential component of regular prenatal examination in several affluent countries and is becoming into an important component of health examination in developing countries.<sup>2,13,14</sup> Pregnant women's oral health is harmed by a variety of variables, including socioeconomic status, education level, age, food, lack of dental awareness, and hygiene habits.<sup>15</sup> Because of the alleged link between periodontal disease and unfavorable pregnancy outcomes such as preterm birth, low birth weight, and pre-eclampsia, pregnant women's dental health is currently receiving attention.<sup>16-18</sup> Scientific literature on oral health awareness and oral hygiene practices, among married women in other parts of Saudi Arabia, is available; our literature search did not return any studies conducted on this topic in Al-Ahsa governorate. Hence, we conducted this study with an aim to assess the oral health knowledge and oral hygiene practices of married women in the Saudi Arabia, Al-Ahsa city.

## Materials and Methods

This cross-sectional descriptive study was conducted between April and July, 2022 among married women who

attended the outpatient clinics of the Mother and Child Hospital in the Saudi Arabian city of Al-Ahsa. Study subjects were recruited based on convenient sampling approach. Ethical approval was obtained from the Ethics Committee of King Faisal University, Al-Ahsa. Necessary permissions were obtained from the Director of Mother and Child Hospital. The purpose and procedure of the study were explained to the potential study subjects and a voluntary informed consent was sought from them. A self-administered closed-ended questionnaire was developed in Arabic language. The first part of the questionnaire sought demographic and socioeconomic details including age, education, income, occupation and location. The status of being pregnant, the length of marriage, and the number of children were included in the second section. The subsequent section of the questionnaire included sixteen questions on oral health awareness and oral hygiene practices. The questionnaire was validated by two senior researchers and faculty in dental epidemiology. Reliability of the questionnaire was established by test-retest reliability on a sample of 30 subjects (intraclass correlation coefficient = 0.82). Internal consistency was tested by Cronbach's  $\alpha$  test. The test yielded a Cronbach's  $\alpha$  value of 0.74, which indicates an acceptable internal consistency. The questionnaire was prepared in a Google form and its link was shared to the WhatsApp numbers of those women who agreed to participate in the study. Study subjects were recruited from the outpatient departments of Mother and Child Hospital, Al-Ahsa, on 10 consecutive working days in the month of May 2022. A reminder message was sent to the WhatsApp number of each potential participant 1 week after recruitment.

Data analysis was done using the SPSS statistics version 24.0 (IBM Corp., New York, United States). For continuous variables, descriptive statistics were calculated using the mean and standard deviation (SD); for categorical variables, they were calculated using the frequency and percentage. To ascertain the relationship between self-reported oral health and oral hygiene practices (as dependent variables) with demographic variables (as independent variables), binary logistic regression analysis was used. Demographic variables such as age ( $>/\leq 30$ , mean  $\pm$  SD =  $29.99 \pm 8.94$ ), married life years ( $>/\leq 10$ , mean  $\pm$  SD =  $9.5 \pm 8.45$ ), number of children ( $>/\leq 3$ ), currently pregnant (yes/no), education ( $\geq / <$  bachelor), income ( $>/\leq 10$ ), occupation (employed/unemployed), area of residence (urban/rural), and all oral health and oral hygiene practice-related questions were categorized for regression analysis.<sup>13</sup> The significance level was set at *p*-value less than or equal to 0.050.

## Results

### Demographics of Study Sample

Three hundred fifty-six married females responded to the study. Two-hundred twelve (60%) women belonged to urban and 144 (40%) belonged to rural areas. Two-hundred thirty-one (65%) females had a bachelor's degree. One-third of the respondents reported their monthly family income in the range of SAR 5001 to 10000. Fifty-six percent women were

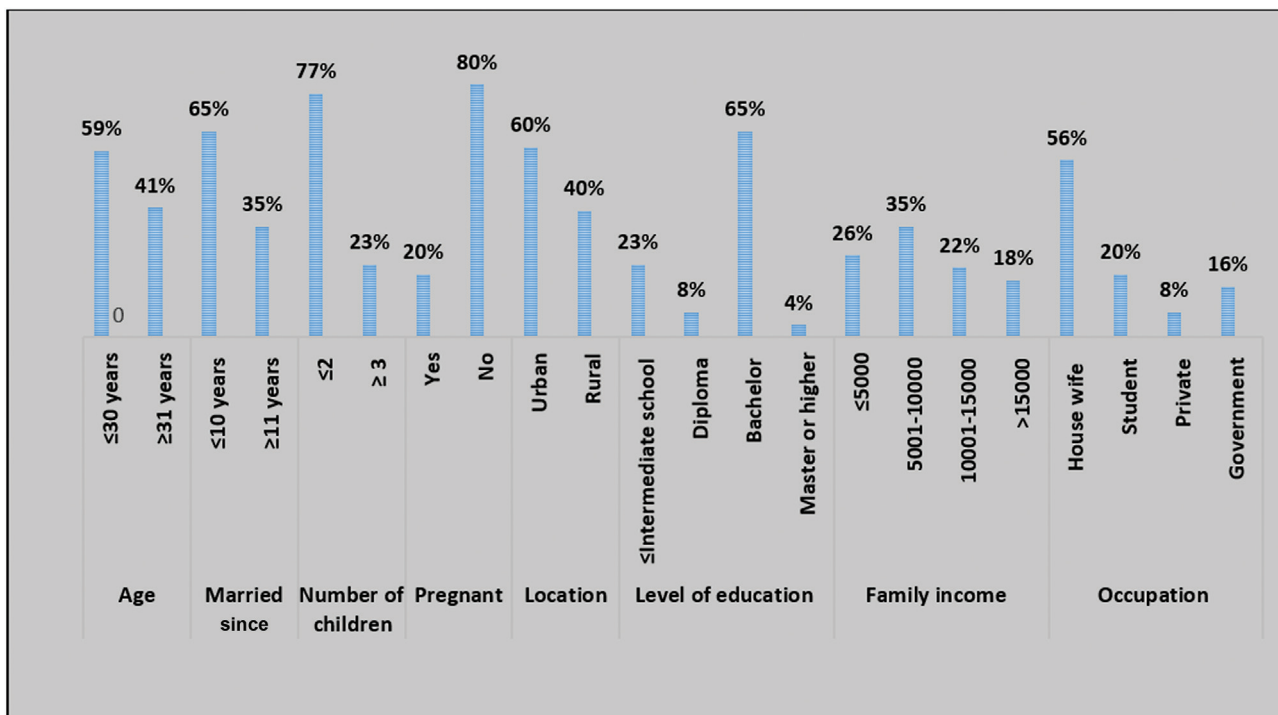


Fig. 1 General characteristics of study participants.

housewives and 24% were employed. Majority of the respondents (59%) were in the age group of less than or equal to 30 years. Most of the participants (65%) were married for less than 10 years. Most of the respondents (60%) had three or less number (14% had three, 19.1% had two, 26.7% had one) of children and 17% had no children. One-fifth of the respondents were pregnant at the time of the study (► Fig. 1).

**Oral Health Awareness and Oral Hygiene Practices**

►Table 1 presents the responses of study participants on their oral health awareness and oral hygiene practices. Ninety percent of the respondents reported that they brush their teeth daily once or more than once daily, and 10% did not brush. More than half of the respondents reported flossing their teeth (52.2%) and using mouthwash (57.9%). About 78.9% patients visited a dentist only when they had a dental problem. The prevalence of oral illnesses is believed to rise during pregnancy by 67.7% of the respondents. About 42.4% of them felt that their dental health might affect the health of their children. Sixty-two percent believed that dental caries is a disease. Almost all the respondents (95.8%) believed that dental caries is caused by either bacteria or sugars. About 66.6% were aware that pregnant women could develop pregnancy gingivitis. About 61.2% of respondents responded knew that gum disease can cause tooth loss during pregnancy. Only 8.4% believed that bad oral hygiene and gingivitis could lead to birth of premature baby; more than half of them (53.4%) believed that gingivitis has nothing to do with preterm delivery and 38.2% were not sure about it. Regarding their perceptions about routine dental visit during pregnancy, 84.6% felt that it is safe to have a dental visit during pregnancy and 75.3% felt that visiting dentist would be

important during pregnancy. Among the women who were ever pregnant, 33.7% had visited a dentist during pregnancy where as 51.4% did not visit. About 12.4% visited for routine checkup, 16.3% visited for restorations, and 4.8% for dental extractions. Regarding the reasons for not visiting a dentist during pregnancy, 36.8% responded that they did not need any services, 17.1 and 5.6% sited financial issues and fear as reasons, respectively. About 9.3% felt that it might be harmful for their fetus or themselves.

**Regression Analysis**

Binary logistic regression analysis showed that young females of this study sample were significantly ( $p = 0.001$ ) more aware about effect of oral disease on baby’s health; females with less married life years had more knowledge about increased incidence of oral disease during pregnancy ( $p = 0.015$ ) and visit during pregnancy ( $p = 0.035$ ); more females with less number of children had knowledge about pregnancy gingivitis; ( $p = 0.011$ ); more females with higher education had knowledge about cause of dental caries ( $p = 0.010$ ). Higher income level showed significant effect on use of dental floss ( $p = 0.001$ ), yearly visit to dental clinic ( $p = 0.010$ ), and knowledge of bad oral hygiene on premature birth (0.011). Employed females had significantly higher knowledge about effect on baby during pregnancy ( $p = 0.010$ ), and urban females were significantly higher in number in use of dental floss ( $p = 0.022$ ) and mouth wash ( $p = 0.050$ ; ► Table 2).

**Discussion**

The demographic data of this sample with respect to age, income status, married life years, education status, and

**Table 1** Study participants' response [*n* (%)] to oral health-related questions

Oral health-related questions	<i>n</i> (%) = 356
<b>Q1. How many times do you brush your teeth daily?</b>	
Once	109 (30.6)
Twice	170 (47.8)
Three times and more	40 (11.2)
Do not brush teeth	37 (10.4)
<b>Q2. Do you use dental floss?</b>	
Daily	28 (7.9)
Sometimes	158 (44.3)
Never	170 (47.8)
<b>Q3. Do you use mouthwash?</b>	
Daily	31(8.7)
Sometimes	175 (49.2)
Never	150 (42.1)
<b>Q4. How many times you usually visit the dental clinic per year?</b>	
Once	40 (11.2)
Twice	35 (9.9)
When I have a dental problem	281 (78.9)
<b>Q5. Do you think the incidence of oral disease increased during pregnancy?</b>	
Yes	241 (67.7)
No	44 (12.4)
Do not know	71(19.9)
<b>Q6. In your opinion does oral disease effect the baby's health?</b>	
Yes	151 (42.4)
No	205 (57.6)
<b>Q7. Is dental caries a disease?</b>	
Yes	220 (61.8)
No	73(20.5)
Do not know	63(17.7)
<b>Q8. In your opinion what is the cause of dental caries?</b>	
Bactria	219 (61.5)
Sugar and carbohydrate consumption	122 (34.3)
Do not know	15 (4.2)
<b>Q9. Are you aware that women can develop pregnancy gingivitis (swollen red gums) during pregnancy?</b>	
Yes	237 (66.6)
No	119 (33.4)
<b>Q10. Do think that gum disease can lead to tooth loss during pregnancy?</b>	
Yes	218 (61.2)
No	47 (13.2)
Do not know	91(25.6)
<b>Q11. Do you think bad oral hygiene (gingivitis) can lead to birth of premature baby?</b>	
Yes	30 (8.4)
No	190 (53.4)
Do not know	136(38.2)
<b>Q12. In your opinion is it safe to have a dental visit during pregnancy?</b>	
Yes, it is safe	301 (84.6)
No, it is not safe	55 (15.4)
<b>Q13. Do you think visiting the dentist is important during pregnancy?</b>	
Yes	268 (75.3)
No	88 (24.7)
<b>Q14. Did you visit a dentist during the period of your pregnancy?</b>	
Yes	120 (33.7)
No	183 (51.4)
No Response	53 (14.9)

**Table 1** (Continued)

Oral health-related questions	n (%) = 356
<b>Q15. What are the reasons for visiting the dentist during pregnancy?</b>	
For checkup	44 (12.4)
For teeth cleaning	30 (8.4)
For teeth filling	58(16.3)
For tooth removal	17 (4.8)
No response	37 (10.3)
Did not visit	170(47.8)
<b>Q16. What are the reasons for not visiting the dentist during pregnancy?</b>	
Afraid of the dentist	20 (5.6)
No time	16(4.5)
No need	131 (36.8)
Maybe harm my child or myself	33 (9.3)
Financial reasons	61 (17.1)
No response	95 (26.7)

number of children is very much consistent to a previous study conducted on pregnant females in Al-Ahsa hospital<sup>19</sup> and corresponds to a study by Togoo et al.<sup>20</sup> According to reports, a variety of sociodemographic characteristics, including more women with higher education (University degree 45%), the length of marriage, the number of children (>/≤3), and the age of the mother at childbirth (>26 years), have an impact on the oral health of Saudi Arabia's population.<sup>13,15</sup>

Regarding oral health awareness among females of this study, majority (68%) of the married females thought that incidence of oral diseases increases during pregnancy as it is a common saying that a “mother loses a tooth with every baby.”<sup>2</sup> Many (42.4%) believed that their oral health can influence the health of their offsprings. About 61.8% of them knew that caries is a disease that is consistent with another study.<sup>21</sup> About 66.6% were aware that women can develop pregnancy gingivitis during pregnancy, while 86% of females in the study by Agarwal et al<sup>2</sup> were aware of connection of oral health with pregnancy. According to a research by Xiong et al, 61.2% of respondents believed gum disease can cause tooth loss during pregnancy.<sup>16</sup> Only 8.4% believed that bad oral hygiene and gingivitis can lead to birth of premature baby that coherent with other studies,<sup>18,22</sup> but more than half of them (53.4%) believed that gingivitis has nothing to do with preterm delivery. Regression analysis indicated that aged women knew that oral disease affects baby' health, and older women were aware that having tooth problems during pregnancy might harm the unborn child's health. Younger and less-married women were aware that gingivitis might occur during pregnancy. Knowledge of having pregnancy gingivitis was significantly associated with females having more number of children. Higher level of education, higher income, females in occupation, and urban area living were statistically associated with oral health-related knowledge and practices that are consistent with previous studies.<sup>15,20,21</sup>

Oral hygiene practices and dentist visit observed in this study are comparable with that of Payal et al's study<sup>14</sup> that showed 93.12% were aware that cleaning is essential for teeth, still only 24.38% subjects used to brush twice daily. About 19.38% of pregnant females were aware of the fact that oral

hygiene can affect their growing baby, 72.81% of pregnant females never visited to the dentist, whereas 17.81% attended dental clinic whenever a problem occurred. One-third females of this study sample reported to have visited dentist during pregnancy, whereas in a study by Elangovan et al<sup>22</sup> only 11.2% visited the dentist during pregnancy. None of the pregnant female had visited the dentist for regular checkup during her pregnancy. These findings of this study are also consistent with that of an Australian study,<sup>23</sup> and a Saudi study by Mansour and Khalid.<sup>24</sup> Lack of oral hygiene and its ill-effects on oral health can be avoided by good oral hygiene practices<sup>25</sup> Oral hygiene of women of this study has been observed at a level that is comparable with other studies.<sup>19,25,26</sup> Oral health practices may be improved by enhancing awareness through transmitting knowledge that leads to positive attitude and good health-related behaviors.<sup>14,27</sup>

### Conclusions and Recommendations

Majority of study participants demonstrated oral awareness during pregnancy. This study has demonstrated a favorable correlation between oral health habits and knowledge and the sociodemographic variables of education, urban location, fewer children, and shorter duration of marriage. Women with low socioeconomic class were less aware of their oral health issues and the importance of taking care of one's oral health during pregnancy. Encouraging married women to practice good oral hygiene and offering them access to affordable dental care are essential to reducing dental disease both during and after pregnancy. It is recommended to sensitize gynecologists and other antenatal care providers about the importance of oral health during pregnancy, so that they can advise the pregnant women to maintain optimal oral hygiene and avail oral care at appropriate time.

### Limitations of the Study

This study employed a cross-sectional study design and the self-reported responses were collected by sending the Google Forms link of the questionnaire to the WhatsApp

**Table 2** Binary logistic regression analysis of demographic variables and oral health-related questions

Dependent variables (yes/no)	Independent variables									
	Age	Married life years	Pregnancy	Number of children	Education	Income	Occupation	Living area		
Brush teeth daily	1.956 (0.693-5.723) 0.220	1.016 (0.310-3.327) 0.979	2.044 (0.618-6.754) 0.241	0.526 0.157-1.780 0.297	1.651 0.790-3.449 0.182	0.823 0.384-1.766 0.618	1.880 0.870-4.059 0.108	1.206 0.582-2.499 0.613		
Use dental floss	1.231 0.653-2.320 0.520	1.242 0.604-2.556 0.556	0.585 0.332-1.033 0.065	0.612 0.295-1.268 0.186	1.341 0.826-2.176 0.235	2.337 1.471-3.842 0.001	1.060 0.672-1.671 0.803	1.690 1.080-2.644 0.022		
Use mouthwash	0.859 0.456-1.617 0.638	2.012 0.961-4.210 0.064	1.487 0.835-2.649 0.178	0.511 0.247-1.058 0.071	1.032 0.080-2.090 0.279	1.271 0.789-2.046 0.324	1.299 0.827-2.042 0.256	0.533 0.342-0.831 0.05		
Visit the dental clinic per year	0.726 0.283-1.826 0.504	0.825 0.295-2.039 0.714	1.183 1.477-2.929 0.717	1.516 0.534-4.303 0.434	0.476 0.197-1.152 0.100	0.388 0.188-0.799 0.010	0.936 0.464-1.887 0.852	1.137 0.568-2.277 0.718		
Incidence of oral disease increases during pregnancy	0.735 0.383-1.412 0.356	0.256 1.198-5.512 0.015	0.920 0.522-1.622 0.774	1.750 0.767-3.992 0.184	1.094 0.657-1.822 0.737	0.863 0.522-1.426 0.565	1.328 0.624-2.139 0.244	0.928 0.580-1.458 0.756		
Oral disease affects the baby's health	3.034 1.589-5.985 0.001	0.603 0.286-1.270 0.183	0.830 0.467-1.474 0.525	0.797 0.389-1.632 0.535	1.358 0.830-2.232 0.223	1.069 0.655-1.719 0.782	1.813 1.154-2.846 0.010	1.036 0.663-1.618 0.877		
Is dental caries a disease	1.279 0.672-2.432 0.454	1.776 0.844-3.740 0.130	1.713 0.955-3.705 0.071	0.731 0.337-1.509 0.376	0.637 0.387-1.050 0.077	1.076 0.66-1.739 0.765	0.981 0.623-1.544 0.093	0.779 0.498-1.218 0.723		
Know the cause of dental caries	1.219 0.275-5.397 0.795	0.731 0.132-4.047 0.720	0.458 0.122-1.712 0.254	0.580 0.110-3.072 0.522	4.509 1.438-14.13 0.010	1.236 0.368-4.146 0.732	1.105 0.347-3.517 0.865	0.988 0.331-2.948 0.983		
Women can develop pregnancy gingivitis	0.800 0.359-1.785 0.587	0.969 0.387-2.242 0.947	0.829 0.414-1.659 0.596	4.322 1.391-13.42 0.011	0.972 0.503-1.877 0.932	0.732 0.388-1.346 0.306	0.911 0.500-1.661 0.761	0.978 0.538-1.779 0.943		
Gum disease can lead to tooth loss	0.890 0.478-1.660 0.715	1.441 0.712-2.915 0.310	1.129 0.846-1.974 0.670	1.571 0.761-3.423 0.222	0.866 0.532-1.409 0.562	0.704 0.438-1.131 0.147	1.558 0.987-2.460 0.057	0.776 0.498-1.209 0.262		
Bad oral hygiene (gingivitis) can lead to birth of premature baby	2.663 0.979-7.243 0.055	0.876 0.2889-2.652 0.815	1.251 0.480-3.266 0.647	0.359 0.120-1.300 0.127	1.373 0.542-3.481 0.504	3.002 1.291-6.982 0.011	1.130 0.591-2.905 0.507	1.244 0.570-2.719 0.583		

Table 2 (Continued)

Dependent variables (yes/no)	Independent variables									
	Age	Married life years	Pregnancy	Number of children	Education	Income	Occupation	Living area		
Dental visit during pregnancy is safe	1.680 0.791-3.569 0.177	1.259 0.534-2.968 0.559	1.123 0.592-2.130 0.724	0.562 0.236-1.336 0.192	0.816 0.470-1.419 0.471	1.738 0.994-3.041 0.053	1.334 0.769-2.235 0.274	0.959 0.580-1.587 0.871		
Dental visit is important during pregnancy	1.509 0.600-3.795 0.382	2.195 0.714-6.714 0.710	1.500 0.676-3.332 0.319	0.462 0.149-1.435 0.182	0.800 0.408-1.568 0.156	1.570 0.800-3.080 0.190	0.894 0.490-1.634 0.171	0.978 0.526-1.744 0.886		
Had visited during pregnancy	1.085 0.564-2.084 0.807	2.198 1.056-4.053 0.035	0.894 0.487-1.640 0.717	0.694 0.339-1.420 0.318	0.569 0.538-0.931 0.025	0.920 0.560-1.510 0.740	1.454 0.961-2.483 0.072	0.953 0.600-1.513 0.839		

Odds ratio (95% CI), p-value.

numbers of the potential participants. Respondent's bias is an inherent limitation in any study that collects self-reported data. Recall bias is important. However, the respondents were assured of anonymity and requested to provide responses without any bias and prejudices. That the questionnaire link was sent to the WhatsApp numbers has a potential limitation of introducing selection bias. However, during the pilot study, we noticed that almost all the women who carried a mobile phone was using WhatsApp application. In a country like Saudi Arabia, where many cultural barriers exist to collect responses from female respondents, we found WhatsApp application to be the most suitable tool to disseminate the questionnaire. However, given the fact that number of female researchers is steadily increasing in the Kingdom, it is advisable to take up detailed qualitative studies to explore these issues at a greater depth.

**Ethical Approval**

Ethical approval was obtained from Deanship of Research, King Faisal University vide # KFU-REC-2022-FEB-EA000462 on 15-02-22.

**Authors' Contributions**

S.A.H.B. conceived the study, wrote initial and final draft preparation; A.B., H.A.M., A.A.Z., and S.S. collected and managed data analysis; S.S. prepared results; Z.K. reviewed and edited the manuscript. All authors have critically reviewed the manuscript and agreed to submitted version of the manuscript and are responsible for similarity index of the manuscript.

**Data Availability Statement**

Data are available upon request.

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**Conflicts of Interest**

None declared.

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