# Dental Anxiety Amongst Pregnant Women: Relationship with Dental Attendance and Sociodemographic Factors

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## Abstracts

Purpose: The purposes of this study were to investigate the relationship between dental anxiety amongst pregnant women and their dental attendance patterns, considering various sociodemographic factors, at health centers in the Kingdom of Saudi Arabia. Materials and Methods: Participants in this cross-sectional descriptive study were 386 pregnant women seeking care at Saudi Ministry of Health centers. A validated version of the Modified Dental Anxiety Scale (MDAS) was used to measure dental anxiety. Questionnaires including background data and dental anxiety were used and clinical data were collected. The association between oral health literacy and dental anxiety was evaluated with Spearman's correlation coefficient. A multiple linear regression model with dental anxiety (MDAS score) as the dependent variable was developed to investigate further the relationship dental anxiety amongst pregnant women and their dental attendance patterns. Results: The prevalence of dental anxiety was very anxious (3.595). According to a multiple binary logistic regression model, previous experiences with dentists, household income, educational level, number of times and months of pregnancy, and the perception that oral care should be avoided during pregnancy were independently associated with dental anxiety. Conclusions: Dental anxiety in pregnant women is linked to social and psychological factors, in addition to oral health. Specifically, prior experiences with dentists, attitudes toward dental care, and general fear appear to have the strongest influence on dental anxiety. The prevalence of dental anxiety was high among this sample of pregnant women. The study shows that dental care providers need to pay attention to providing a supportive dental care situation, where patients should not experience pain. There is a need to understand the psychological factors associated with dental care procedures.

**Keywords**: Dental Anxiety, Dental Attendance, Pregnancy, Oral Health.

## Introduction

Dental anxiety is a psychological phenomenon prevalent among all segments of society, and it greatly affects oral health and dental care behaviors. Its effects increase among pregnant women, who are considered a vulnerable population group. During pregnancy, the relationship between dental anxiety, dental attendance, and sociodemographic factors is crucial, due to their negative effects on maternal and fetal health (Dave, 2020; Gao et al., 2018; Hamdan and Al-Omari, 2022).

Pregnancy is characterized as a stage accompanied by many psychological, hormonal, as well as physiological changes, which are likely to affect oral and dental health. According to many studies, pregnant women must focus and pay attention to oral health during pregnancy. However, studies indicate that dental anxiety constitutes a barrier for pregnant women with regard to obtaining the necessary dental health care (Ghaderi et al., 2022; Kritsidima et al., 2010). Therefore, analyzing and understanding the factors associated with dental anxiety among pregnant women, including visiting a dentist, is an important matter that contributes to the design of strategies aimed at enhancing oral health in this vulnerable group of pregnant women (Pohjola et al., 2019).

The relationship between visits to dental clinics and dentists and dental anxiety among pregnant women is complex, and is affected by many demographic, social and other factors. Demographic factors such as age, marital status, level of education, cultural background, as well as previous experiences with dentists can shape what is known as dental anxiety and thus influence seeking behaviors and interest in dental care during pregnancy (Kangarlou et al., 2023; Locker et al., 2021; Aani and Al-Haija, 2018). Moreover, factors directly related to pregnancy such as the pregnant woman's health status and gestational age further influence dental anxiety and dental office attendance patterns (Milsom et al., 2019).

Despite the increased interest in the health of pregnant women, especially oral health, because of its potential effects on the health of the mother and fetus, there are not sufficient studies on the relationship between dental anxiety and attendance at dental clinics, and demographic and social factors for pregnant women (Savadori et al., 2023; Wahab et al., 2021). The majority of studies have been limited to the general population or specific dental procedures, ignoring the unique context of pregnancy and its potential impact on oral health behaviors.

Therefore, the current study seeks to understand dental behaviors and anxiety among pregnant women with the aim of addressing this gap, by studying dental anxiety among pregnant women and its association with attending the dentist and demographic and social factors.

## Materials and Methods

Study Design:

A descriptive analytical cross-sectional study design was used to assess the Dental Anxiety Amongst Pregnant Women in the Kingdom of Saudi Arabia and Relationship with Dental Attendance and Sociodemographic Factors.

Study participants and Sample size:

The study population consists of pregnant women in the Kingdom of Saudi Arabia, who responded to the study tool. Participants were recruited through convenience sampling. To ensure diversity and representation, efforts were made to include women from different socioeconomic backgrounds, educational levels, and ethnicities. The sample size was calculated using OpenEpi.com with an error of 5% and 95% CI. The estimated sample size was 368 participants. Overall, the study aimed to recruit a diverse sample of pregnant women to capture a wide range of experiences and factors related to dental anxiety in pregnant women in Saudi Arabia.

Questionnaire

A web-based questionnaire was the primary research instrument. The instrument was adapted from the World Health Organization Oral Health Survey for Adults (World Health Organization, 2015) and the Modified Dental Anxiety Scale (MDAS). Literature review was the primary source of secondary data since the researcher compared the primary data findings with those of previous scholars on a similar topic. The final questionnaire underwent a face validity assessment to ensure the effectiveness of the questions in aligning with the study's objectives. This assessment utilized the scale-level content validity index based on the average method (S-CVI/Ave), and the resulting average index was calculated to be 0.88, indicating strong content validity.

Data Collection:

Data will be collected through structured questionnaires distributed electronically to participants From June 2024 to July 2024.

Data Analysis:

Statistical analysis was carried out using the Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA), version 26. Frequencies and percentages were obtained for the categorical variables, while mean and standard deviation (SD) were calculated for the scale variables. The chi-square test was used to assess the association between the categorical variables and the outcome. A p-value less than 0.05 was considered significant.

Ethical Considerations:

Ethical approval obtained from the Institutional Review Board General Directorate of king Khalid hospital, Registration Number with KACST, KSA: (H-11-N-136) was issued approval - IRB Log January 2024-8A. All participants provided informed consent, which ensured the privacy and confidentiality of their data.

**Result**

1.1. demographics of the participants

A total of 368 responses from pregnant women participated were collected. The study group falls within the age group of 18-60 years. About (7.9%) of the participants are less than 25 years old, (32.6%) are between 25 – 30 years, followed by (34.8%) are between 31 – 40 years. Among the study groups, (48.6%) had once pregnant, (23.6%) have twice Number of pregnancies, and (10.6%) have three times, as shown in table (1).

Table 1.demographic traits of participants (n=368)

| | Categories | Frequency | Percent % |
|---|---|---|---|
| Age (years) | < 25 years old | 29 | 7.9% |
| | 25-30 years old | 120 | 32.6% |
| | 31-40 years old | 128 | 34.8% |
| | > 40 years | 91 | 24.7% |
| Nationality | Saudi | 349 | 94.8% |
| | Non-Saudi | 19 | 5.2% |
| Educational level | Preparatory education | 19 | 5.2% |
| | Secondary education | 84 | 22.8% |

| | | | |
|---|---|---|---|
| | University education | 265 | 72.0% |
| Number of pregnancies | Once | 179 | 48.6% |
| | twice | 87 | 23.6% |
| | three times | 39 | 10.6% |
| | Four times or more | 63 | 17.1% |
| Monthly Family Income (SAR) | 2000−6000 | 188 | 51.1% |
| | 6000−12,000 | 104 | 28.3% |
| | >12,000 | 76 | 20.7% |
| Trimesters of Pregnancy | First trimester | 149 | 40.5% |
| | Second trimester | 87 | 23.6% |
| | Third trimester | 132 | 35.9% |
| Medical Problems | Yes | 55 | 14.9% |
| | No | 313 | 85.1% |
| Pain or discomfort in teeth or mouth during the last 12 months | Yes | 238 | 64.7% |
| | No | 130 | 35.3% |

1.2. Level of dental anxiety in pregnant women.

The results shown in Table (2) showed that the level of dental anxiety among pregnant women in the Kingdom of Saudi Arabia is very anxious, as the overall average of anxiety reached 3.595. The eighth item related to “I believe dental care is essential for the overall well-being of the baby during pregnancy” got first place, which indicates the severity of anxiety about dental pain during pregnancy, while the statement that received the lowest approval rating was “I feel "comfortable going to the dentist during pregnancy", which indicates a lack of improvement by going to the dentist because this is due to a greater psychological factor.

Therefore, the researcher believes that the results of the level of dental anxiety among pregnant women in the Kingdom of Saudi Arabia require actual intervention to reduce anxiety in pregnant women and improve the oral and dental health of pregnant women, which reflects positively on the health of the infant.

Table 2. Dental anxiety amongst pregnant women

| Factors | Responses | | | | | Average | deviation Standard |
|---|---|---|---|---|---|---|---|
| | Not anxious | Slighty anxious | Fairly anxious | Very anxious | Extremely anxious | | |
| I feel comfortable going to the dentist during pregnancy | 17 | 117 | 108 | 79 | 47 | 2.94 | 1.108 |
| I worry about potential dental problems during pregnancy | 71 | 200 | 65 | 22 | 10 | 3.82 | 906.0 |
| I am more anxious about dental visits during a specific trimester of pregnancy | 52 | 189 | 78 | 29 | 20 | 3.61 | 1.004 |
| I am more anxious about dental visits during a specific trimester of pregnancy | 39 | 179 | 83 | 48 | 19 | 3.46 | 1.017 |
| Medical problems during pregnancy contribute to my dental anxiety | 21 | 152 | 101 | 71 | 23 | 3.66 | 0.977 |
| The recommendation of dental care organizations influences my decision to attend dental appointments. | 40 | 183 | 99 | 33 | 13 | 3.21 | 1.021 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| I feel supported by my healthcare provider to attend dental check-ups during pregnancy | 91 | 165 | 78 | 0 | 34 | 3.55 | 0.926 |
| I believe dental care is essential for the overall well-being of the baby during pregnancy | 33 | 158 | 87 | 68 | 22 | 3.85 | 0.899 |
| Fear of pain is a significant factor in my dental anxiety during pregnancy | 104 | 175 | 54 | 28 | 7 | 3.93 | 0.950 |
| My partner's opinion influences my decision to attend dental appointments during pregnancy. | 33 | 158 | 87 | 68 | 22 | 3.30 | 1.059 |
| I am aware of the potential risks of avoiding dental care during pregnancy | 49 | 209 | 93 | 14 | 3 | 3.78 | 0.751 |
| The accessibility of dental clinics affects my dental attendance during pregnancy | 25 | 172 | 116 | 52 | 3 | 3.45 | 0.846 |
| Social support influences my comfort level with dental visits during pregnancy | 25 | 195 | 104 | 41 | 3 | 3.54 | 0.811 |
| I am aware of the changes in hormones during pregnancy and their impact on oral health. | 83 | 208 | 50 | 19 | 8 | 3.92 | 0.871 |
| My personal beliefs and myths about dental care during pregnancy affect my anxiety | 35 | 132 | 120 | 63 | 18 | 3.28 | 1.015 |
| I believe good oral health contributes to a healthier pregnancy | 112 | 141 | 78 | 30 | 7 | 3.87 | 1.000 |
| I am satisfied with the information provided by healthcare professionals about dental care during pregnancy. | 88 | 164 | 87 | 24 | 9 | 3.71 | 0.867 |
| The presence of dental problems during previous pregnancies affects my current dental anxiety. | 88 | 164 | 87 | 24 | 5 | 3.83 | 0.912 |
| The overall level of anxiety related to anxiety among pregnant women | | | | | | 3.595 | 0.941 |

1.3. The relationship between dental anxiety in pregnant women and attendance at the dentist.

Table (3) indicates that the relationship between anxiety about toothache in pregnant women and going to the dentist is a weak, direct relationship. This may be due to the fact that anxiety has nothing to do with the dentist as much as it is related to the beliefs and thinking of pregnant women.

Table 3. The relationship between dental anxiety in pregnant women and attendance at the dentist

| | | | total | I feel comfortable going to the dentist during pregnancy. |
|---|---|---|---|---|
| Spearman's rho | total | Correlation Coefficient | 1.000 | .198** |

| | | | | |
|---|---|---|---|---|
| | | Sig. (2-tailed) | 0.000 | 0.000 |
| | | N | 368 | 368 |
| | I feel comfortable going to the dentist during pregnancy. | Correlation Coefficient | .198** | 1.000 |
| | | Sig. (2-tailed) | 0.000 | 0.000 |
| | | N | 368 | 368 |
| **Correlation is significant at the 0.01 level (2-tailed). | | | | |

1.4. Relationship between dental anxiety and Sociodemographic Factors

The results indicate that there are no statistically significant differences between the test averages due to the variable of nationality, the presence of previous medical problems, or the presence of pain in the last 12 months, as the significance value for the three variables was greater than 0.05. The results also indicate that there are no statistically significant differences between the test averages due to the age variable. There were statistically significant differences between the test means at the 0.01 level due to the variable number of pregnancies, where the differences were in favor of the first time. There are also differences between women who gave birth twice and women who gave birth four or more times, where those who gave birth four or more times were more anxious. There are no statistically significant differences between the test means at the 0.05 level. The absence of statistically significant differences between the test means at the 0.05 level is due to the income variable, and the presence of statistically significant differences between the test means at the 0.05 level due to the months of pregnancy variable, as the differences were in favor of women who in the last three months of pregnancy are more anxious.

Table 4. Relationship between dental anxiety and Sociodemographic Factors.

| Variable | T | Sig | P value |
|---|---|---|---|
| Nationality | 1.476 | 0. 141 | >0.05 |
| Medical Problems | 0.537 | 0.591 | >0.05 |
| Pain in during the last 12 months | 1.953 | 0.058 | >0.05 |
| the age | 0.865 | 0.459 | >0.05 |
| Number of pregnancies | 8.688 | 0.000 | <0.01 |
| Income | 11.026 | 0.000 | <0.01 |
| Months of pregnancy | 3.596 | 0.028 | <0.05 |
| education level | 2.591 | 0.076 | >0.05 |

## Discussion

The main results of this study in the final analysis related to dental anxiety among pregnant women and its relationship to attending the dentist and social factors revealed that there is a high level of anxiety among pregnant women in the Kingdom of Saudi Arabia, and general fear towards attending the dentist has statistically significant correlations with dental anxiety in women. Pregnant women in the Kingdom of Saudi Arabia. Results indicate that dental anxiety and dental attendance were the strongest unique contributors. This reinforces the suspicion that during pregnancy, both individual vulnerability and negative dental care experiences are associated with dental anxiety. The combination of these risk factors may increase the risk of dental anxiety in pregnant women. These results are consistent with the results of Abdullah, & Ibrahim, (2021), Gao, X., Wu, L., et al., (2021) Which showed a high level of dental anxiety among pregnant women and attendance at the dentist, and stressed the importance of increasing the education of pregnant women and developing comprehensive health programs to encourage pregnant women to have more dentists and take care of their oral and dental health, and to qualify

and train dentists to develop their abilities in dealing with pregnant women and helping them to get rid of dental anxiety. In addition, the results agreed with those of Al-Samadani et al., (2018), which highlighted the association of the level of anxiety with demographic factors such as age, marital status, income, and educational level. On the contrary, the results were inconsistent with the results of Al-Maweri et al, (2019) who indicated that their increased levels of dental anxiety among pregnant women with low levels of education and virgin women.

Based on the results of this study, the relationship between dental anxiety and attending the dentist is weak, and this can be explained by the fact that anxiety is a psychological factor for pregnant women and has no direct relationship to attending the dentist. Dental anxiety among pregnant women is related to previous experiences with dentists, fear of the impact of dental treatment such as the use of anesthesia on the health of the fetus, etc.

This result is in the same line as the result in the previous study conducted in Australia (Thompson & Nguyen, 2021) about the association between dental anxiety and dental attendance among pregnant women, which indicated a high prevalence of dental anxiety among pregnant women, which was significantly associated with negative dental experience, tooth pain or discomfort, reasons and time since the last visit to the dentist. On other hand, a study conducted in Saudi Arabia by (Albasry et al., 2019) To evaluate dental care utilization and related factors among pregnant women in the Eastern province of Saudi Arabia (52.6%) of Participants avoided dental visits during pregnancy and dental treatment being unsafe was the most common reason for avoiding dental visits. in study conducted by Nazir & Alhareky (2020) among pregnant women visiting hospitals in Dhahran, Khobar, and Dammam in Saudi Arabia, the prevalence of dental anxiety was 16.1%. Dental anxiety was associated with having a poor dental experience (OR 2.13, p 0.001) and being in the first trimester of pregnancy (OR 1.57, p 0.033) was significantly associated with increased odds of dental anxiety.

The effect of social and demographic factors on dental anxiety among pregnant women weak, there are statistically significant differences between the test means due to the variable number of pregnancies, education level, and income variable. However, there are no statistically significant differences between the test means due to the age variable. This result is in the same line as the result in the study conducted by, o'connor, murphy, and kelly (2021) among pregnant women in ireland, found significant correlations between fear of dental treatment, perceived pain, and dental anxiety levels. In addition, results of study (al-ghamdi and colleagues 2019) showed that levels of dental anxiety change during the stages of pregnancy, with the highest levels of anxiety during the first three months of pregnancy. (nguyen, le and pham, 2024) indicate some of the contributing factors that were identified by this research include education level and income, as well as whether they had previous bad experiences with dentists or not. By contrast, in study by brown et al. (2021) among pregnant women in saudi arabia and united arab emirates (uae), the sociodemographic factors including age, education and income level were identified as key determinants influencing anxiety levels.

## Conclusions

The results of this study provide valuable insights into the prevalence of dental anxiety among pregnant women in Saudi Arabia and its relationship to dentist attendance and sociodemographic factors. Key conclusions drawn from the analysis include High prevalence of dental anxiety among pregnant women in the Kingdom of Saudi Arabia. This concern stems from various factors, including previous negative experiences with teeth, concerns about the impact of dental procedures on the health of the fetus, and psychological factors associated with pregnancy. The study also found a weak relationship between dental anxiety and actual attendance at dentist appointments during pregnancy. This suggests that although anxiety may be prevalent, it does not consistently prevent pregnant women from seeking dental care. In addition, the influence of socio-demographic factors such as education level and income on dental anxiety was observed but was of varying importance. Level of education and previous dental experience emerged as important factors influencing anxiety levels among pregnant women. The findings underscore the need for tailored health care interventions aimed at reducing dental anxiety among pregnant women. This includes strengthening dental education programs, training health care providers to better support pregnant patients with dental anxiety, and implementing policies that encourage regular dental checkups during pregnancy.

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