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### RESEARCH ARTICLE

#### PREVALENCE AND RISK FOR DENTAL PROBLEMS DURING PREGNANCY: A CROSS-SECTIONAL QUESTIONNAIRE STUDY

Zainbganayah Hasan Sulimani , Hanyah Abdulhadi Al-Khify , Ohoud Mohammad Ali Nadrah , Reem Hassan Bashammakh , Dareen Mahmoud Alrahem , Laura Jamal Musairy , Abdulmalik Mohammed Alamri , Bayan Abdulrahman Alkubaydi , Majed Ghurmullah Alzahran, Abdullah Jabbar Alghamd, Ali Saleh Aljuday , Yassmin Mohammed Behyan , Abdullah Abdulrahman AlShenaifi , Tahani S. (A.Z.) Fahmi and Safaa Nasser Alkathiry

1. BDS, SSC-ARD, SF-DI, Consultant in restorative and implant Dentistry, Jeddah Specialty Dental Center-MOH, Kingdom of Saudi Arabia.
2. Althaghor Hospital, Head of Ob/Gyn Department MCH Azizya, Jeddah – Saudi Arabia.
3. Family Medicine Department, King Abdulaziz University, Jeddah, Saudi Arabia.
4. M.D KFAFH: King Fahd Armed Forces Hospital, Obstetrics and Gynecology, Jeddah, KSA.
5. General Dentist , KSA.
6. Dental Intern, KSA.

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#### Abstract

**Objectives:** To assess the prevalence and awareness of dental problems during pregnancy, and to ascertain the risk factors that lead to dental problems in pregnancy.

**Methods:** A cross-sectional questionnaire study was conducted. Patients who were currently pregnant or had been pregnant were selected, and questioned on the frequency and type of dental problems during pregnancy, treatment availed and systemic problems. Recorded data was analysed using SPSS version 17.

**Results:** A total of 64.5% of patients experienced dental problems during pregnancy. Dental caries was the most frequent problem (50.7%), followed by gingivitis (48.4%). Only 14% of patients availed dental treatment. Presence of systemic diseases and low oral hygiene scores were associated with significantly higher incidence of dental problems.

**Conclusions:** This study demonstrated that several pregnant women experience dental problems during pregnancy, however, many perceive that they have normal to good oral hygiene. Low oral hygiene status and systemic problems were more significantly associated with dental problems during pregnancy.

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#### Introduction:-

Pregnancy is an experience that is unique for all women. During pregnancy, most women are acutely conscious of the fact that any health issue affects not only them, but also their unborn infant. Therefore, pregnant women go to great efforts to ensure that they stay healthy. It is unclear, however, whether this concern extends to dental health, which is at risk of being compromised during pregnancy.

**Corresponding Author:- Dr. Hoda Jehad Abousada**

Address:- M.D KFAFH: King Fahd Armed Forces Hospital, Obstetrics and Gynecology, Jeddah, 21159. SA.

**The impact of pregnancy on oral health**

Pregnancy causes a significant change in the body's hormones. Both progesterone and estrogen levels increase considerably, and this not only brings about normal physiological change, it also puts the body at risk for developing certain pathologies.

**Gingival and periodontal disease**

It is estimated that 50-70% of all pregnant women suffer from gingival disease<sup>1</sup>. Increase in blood progesterone and estrogen levels increases the permeability of the small blood vessels of the gingiva. This creates a hyperinflammatory state which makes the patient more susceptible to plaque induced gingivitis. Left untreated, this can easily progress to periodontitis.

Pyogenic granuloma occurs in 1 to 5 % of all pregnant women and, like gingivitis, is a sequel of hypersensitivity to plaque<sup>2</sup>. This occurs on the labial aspect of the interdental papilla. While not dangerous, it is nevertheless an annoying irritant which can sometimes be extremely painful and interfere with mastication. Excision generally leads to recurrence unless done post-partum.

**Dental caries**

The increased estrogen levels in saliva of pregnant women causes increased desquamation of oral epithelium, which in turn provides a richer environment for cariogenic bacteria to thrive. The nausea and vomiting in the first trimester and gastric reflux in the third trimester serve to lower the salivary pH levels. There is also an increased dietary consumption of carbohydrates in pregnancy, either to boost energy or satisfy cravings. All this increases the pregnant women's chances of developing dental caries.

**Necessity for treatment of dental problems:**

Periodontitis has been associated with pre-term birth and low birth weight babies. While dental caries by itself does not affect the fetus, it can lead to pulpitis, apical periodontitis, or dentoalveolar abscesses, all of which are painful conditions. Painkillers are contraindicated during pregnancy because of they can cause premature closure of the ductus arteriosus in the fetus. In addition, any focus of infection such as an abscess or cellulitis, unless treated aggressively and promptly, can lead to complications such as preterm labor.

**Lack of awareness of dental health during pregnancy**

Despite the proven consequences of poor oral health during pregnancy, it is estimated that up to 50% of all women do not visit the dentist when they are pregnant, even if they have had dental complaints<sup>3</sup>. The main reason for this is the lack of awareness of both the increased risk for dental problems, as well as the seriousness of consequences. Studies on lack of awareness have been previously conducted in other countries; however, there are no studies that evaluate dental issues among women living in the Kingdom of Saudi Arabia. The current study, therefore, aimed to assess the prevalence and awareness of dental problems during pregnancy in a subset of this population group.

**Materials And Methods:-**

The current study was a cross-sectional, questionnaire study. This study was conducted in accordance with the STROBE guidelines for cross-sectional studies<sup>4</sup>, and ethical approval was obtained from the Institutional Review Board prior to beginning the study.

**Sampling, inclusion and exclusion criteria:**

Patients for this questionnaire study were randomly selected from the general population in the Western region of the Kingdom of Saudi Arabia. The study was restricted to women, who were above 18 years of age. Women who were pregnant or had been pregnant in the past were included in the study. Male subjects, patients below 18 years of age, and women who had never been pregnant were excluded. Patients who were not comfortable answering the questionnaire, or who refused to give consent were also excluded.

**Data acquisition:**

All patients who met the inclusion criteria were asked to complete a written informed consent, permitting their answers to be used for research purposes. Each patient answered a questionnaire, which was administered in a one-on-one manner by a team of dental students. The questionnaire asked for demographic details which included age and nationality. Patients were then asked about their oral hygiene practices, and the kinds of dental problems they suffered during pregnancy. The time frame of these dental problems, and the treatment they were offered was also

ascertained. Patients were also questioned about different systemic issues that they might have developed during pregnancy, including diabetes and cardiovascular disease.

#### **Data analysis:**

Information from the questionnaire study was collected and extracted onto a digital spreadsheet. Descriptive analysis of all the data was performed. Strengths of association were performed using the chi square test and McNemar's analysis. All data analysis was carried out using SPSS version 17.

#### **Results:-**

A total of 1110 women were recruited for the study. Of these, 221 patients stated that they had never been pregnant and hence were excluded from the study. All the remaining 890 patients completed the questionnaire and consented to the use of its findings for research purposes.

#### **Distribution of dental problems, oral hygiene measures and treatment:**

A total of 574 (64.5%) patients reported that they had experienced dental problems during pregnancy. Of these, 181 patients (31.5%) experienced dental problems during their first trimester, 243 (42.3%) patients experienced problems during the second trimester, and 246 (42.8%) during the third trimester. The most frequent dental problem that patients experienced was tooth decay (291 patients, 50.7%), followed by gingivitis (278 patients, 48.4%). The incidence of pyogenic granuloma seen in this population subset was 25.4%. Despite this relatively high incidence of dental problems, very few patients reported that they had availed dental treatment. Tooth extraction was carried out in 80 patients (13.9%).

Systemic health problems were also reported by some patients. The most common health issue was vitamin deficiency, seen in 331 patients (57.6%). Gestational diabetes was reported in 83 patients (14.5%), while diabetes mellitus was seen in 48 patients (8.4%). Cardiovascular disease was reported by 13 patients (2.3%).

When scored for oral hygiene care during pregnancy, most patients rated their oral hygiene care as average (344, 60% of all patients). 153 patients stated that oral hygiene was excellent (26.6%), while 5.7% believed they had poor oral hygiene care (Table 1).

#### **Strength of association:**

We tested the association between oral hygiene score and the presence and absence of dental problems during pregnancy. It was found that increasing scores were significantly associated with lack of dental problems during pregnancy. We also compared the association between systemic conditions and presence and absence of dental problems. We found that the presence of systemic conditions was significantly associated with the presence of dental problems. These results have been summarized in Tables 2 and 3.

#### **Discussion:-**

The current study attempted to assess the prevalence of different dental problems in pregnancy and ascertain the different risk factors. The prevalence of dental problems during pregnancy is fairly high. We found that low self-reported oral health care measures and systemic problems were associated with a higher incidence of dental problems.

#### **Prevalence of dental problems during pregnancy:**

Almost half the patients in the current sample had experienced gingivitis and/or periodontitis during their pregnancy. This incidence has varied widely in literature, ranging from 10% to 74% in different studies<sup>5</sup>. Periodontal disease has been associated with several systemic conditions, including gestational diabetes<sup>6</sup>. The current study also demonstrated an association between these conditions. Untreated periodontal disease has been associated with pre-term low birth weight babies. This is believed to be a direct consequence of the release of inflammatory mediators like prostaglandins from the inflamed periodontium<sup>5</sup>.

In the current study, over half of the patients had also experienced dental caries during their pregnancy. This incidence is lower than a previous study conducted in Indonesia, where it was estimated that the incidence of dental caries in pregnant women was 84.7%<sup>7</sup>. A previous study by Azofeifa et al demonstrated that there was no significant difference in the incidence of dental between pregnant and non-pregnant women; however, the incidence of

untreated dental caries is much higher in pregnant women<sup>8</sup>. Unlike periodontitis, untreated dental caries has not been associated with pre-term low birth weight babies. However, there is some evidence that cariogenic bacteria can undergo vertical transmission to the fetus, and cause an increased risk for dental caries in children<sup>9</sup>.

### Self-reported oral health care measures during pregnancy

Most patients in the current study believed that their dental care was average to good, and very few patients perceived themselves as having poor oral care. These findings are also in accordance with previous studies in literature. In one study conducted by Christensen et al in Denmark, only 5% reported poor oral conditions, while 95% reported that their oral condition was normal to good<sup>10</sup>. However, out of 33% of patients who reported gingivitis, only 27% responded to the symptoms by seeing a dentist or improving their oral hygiene habits. On the other hand, a similar study in Kuwait reported that 20% of all women felt that their oral hygiene was poor<sup>11</sup>. The study also reported that 50% of the patients had visited a dentist during pregnancy, with the primary reason being dental pain.

### Limitations of the present study and future directions

The main limitation of the study was that the study design was cross-sectional. This resulted in an inability to follow up the same patients, to understand the consequences of oral hygiene status in the long term. This study may be utilized as a stepping stone to future studies, which must be designed to be longitudinal. Future studies can also assess the barriers and facilitators to dental care in pregnant women.

### Tables:

**Table 1:-** Oral Care score reported by patients.

ORAL HYGIENE RATING	NO. OF PATIENTS
1	33
2	86
3	344
4	276
5	153

**Table 2:-** Association between oral care score and dental problems.

DENTAL PROBLEMS	OH 1	OH 2	OH 3	OH 4	OH 5	CHI SQUARE VALUE	P VALUE
NO	6	15	116	99	80	36.14	<0.00001
YES	26	71	228	177	72		

**Table 3:-** Association between systemic problems and dental problems.

DENTAL PROBLEMS	VITAMIN DEFICIENCY	DIABETES MELLITUS	GESTATIONAL DIABETES	CARDIOVASCULAR DISEASE	NON	CHI SQUARE VALUE	P VALUE
NO	6	15	116	99	80	23.76	0.000089
YES	26	71	228	177	72		

### Conclusions:-

This study demonstrated that over 60% of pregnant women experience dental problems during pregnancy, however, many perceive that they have normal to good oral hygiene. Low oral hygiene status and systemic problems were associated with an increased risk of dental problems during pregnancy.

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