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## Assessment of knowledge and awareness level about periodontal health in pregnant women: A questionnaire study

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### Abstract

**Background:** Periodontal disease, including gingivitis and periodontitis, are infections that if left untreated, can lead to tooth loss. The main cause of periodontal disease is bacterial plaque, the initiation and progression of gingivitis and periodontitis can be caused due to factors like pregnancy.

**Aim:** The investigation was carried out to assess the knowledge and awareness of pregnant women about periodontal health and its effect on pregnancy outcomes.

**Materials and methods:** A cross-sectional study was carried out using self-administered structured questionnaire which was distributed to 100 pregnant women which consisted of 19 close ended questions related to knowledge and awareness pertaining to periodontal health during pregnancy. The questions included daily oral health practices and the changes seen in gingiva during pregnancy and also knowledge and awareness questions about the changes in oral health during pregnancy and their effect on pregnancy outcomes.

**Results:** The results showed that about 89% of the study population had poor knowledge, only 11% of them had good knowledge and about 75% of participants were not aware about the importance of dental check-up during pregnancy and 48% of them fear that dental treatment can affect the health of newborn.

**Conclusion:** The study concluded that awareness and knowledge level of periodontal health among pregnant women was low.

**Keywords:** Knowledge, awareness, periodontal health, pregnant women

### Introduction

Periodontal disease, including gingivitis and periodontitis, are infections that if left untreated, can lead to tooth loss. The main cause of periodontal disease is bacterial plaque, the initiation and progression of gingivitis and periodontitis can be caused due to factors like pregnancy<sup>[1]</sup>. Pregnancy represents a fetomaternal balance between the growing fetus and the maternal immune system and it has the potential to reject the fetus<sup>[2]</sup>. Many physiological conditions in women can bring some reversible changes in oral health. Puberty, pregnancy and menopause are the conditions which usually have an effect on the oral health of women. Immunological, dietary and behavioral factors associated with pregnancy are believed to be contributing factors. Pregnant women are particularly susceptible to gingival and periodontal diseases. They may not experience symptoms until advanced disease stages and therefore unknowingly increase perinatal risk. Premature birth, low birth weight babies, pre-eclampsia, ulcerations of the gingival tissue, pregnancy granuloma, tooth erosion, etc are risks seen in pregnancy<sup>[3]</sup>. During the second trimester of pregnancy, gingivitis may occur more frequently because of a rise in the estrogen level that increases the blood flow to the tissue, which exaggerates the reaction of gingival tissue to the irritants in plaque<sup>[4]</sup>.

Many women complain of various symptoms like nausea and vomiting, nasal congestion, heartburn, food cravings, hyperventilation, shortness of breath, and fatigue during pregnancy. These symptoms are due to physiologic changes in cardiovascular system, respiratory system, gastrointestinal system, musculoskeletal system, endocrine and hematological systems, which sequentially cause changes in the oral cavity. These hormonal changes during pregnancy and neglected oral hygiene practices tend to increase the incidence of dental diseases like gingivitis<sup>[5]</sup>.

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**An investigation was carried out to**

1. Assess the knowledge of pregnant women about periodontal health and its effect during pregnancy
2. Assess the awareness about periodontal health and pregnancy outcomes.

**Materials and Methods**

There is no universally accepted or recommended index/inventory to measure oral health knowledge and awareness. The data was collected based on the knowledge and behavioral aspects which was derived from a series of independent questionnaires. The Hiroshima University-Dental Behavioral Inventory (HU-DBI) questionnaire developed by Kawamura has been demonstrated to be useful for assessing patient’s perceptions and oral health behavior and is widely used all around [6].

This is a cross sectional study with a sample consisting of 100 pregnant women reporting to the department of obstetrics and gynecology, Yenepoya medical college, mangalore, using a specially formulated objective type of questionnaire consisting of close ended questions.

Those who were having systemic illness and who were uncooperative or not willing to give consent were excluded from the study. Participation in the survey was voluntary and anonymity was maintained about the personal record. Pregnant women who were not willing to participate in the study & who did not respond/gave back the questionnaire during the stipulated time period were excluded from the study. Ethical approval was obtained from the ethical committee, Yenepoya University, Mangalore, Karnataka.

Questionnaire design- The questionnaire was prepared by the principal investigator in consultation with other authors. Reliability of the questionnaire was assessed using Cronbach’s alpha internal consistency coefficient.

A study specific questionnaire consisted of 19 questions which were divided into four parts;

- personal data, stage of pregnancy, number of pregnancy
- General questions which include daily oral health

practices and the changes seen in gingiva during pregnancy.

- Knowledge about changes in oral health during pregnancy and their effect on pregnancy outcomes.
- Awareness about oral health and pregnancy outcomes.

The questionnaires were distributed to the subjects who came to the department of obstetrics and gynecology of Yenepoya medical college. It took the majority of the participants 5–10 min to complete the questionnaires. The filled responses were then transferred to the microsoft excel sheet for appropriate statistical analysis.

**Statistical Analysis**

Collected data was analysed by frequency percentage and chi-square test. The analysis was carried out by SPSS software version 13.

**Results**

**General Characteristics**

Majority of the participants of this study were in the age group of 21-25 years and around 33% were between 26 and 30 years. The study population was heterogeneous. Out of the total study population 15% had primary school education, 64% had secondary school education and 21% had post secondary school education.

**Response to Knowledge Questions**

The mean knowledge level was around 2.13 (out of 4) [Table-1]. Most of the respondents (89%) had poor knowledge and only 11% had good knowledge. About 47% of the participants did not know that dental check up during pregnancy is safe and only 39% of participants knew that the minor dental treatment can be carried out during pregnancy. The safe period for undergoing dental treatment during pregnancy were not known to 58% of the study population. Majority (79%) of the patients didn’t know how to prevent gum disease and that swelling of gums can occur during pregnancy. [Table-2]

**Table 1**

		No of subjects	%	Mean	Std deviation
knowledge	Poor knowledge	89	89.0%	2.13	1.178
	Good knowledge	11	11.0%		
	Total	100	100%		

**Table 2**

Knowledge		No. of subjects	%
1. Do you know whether dental check up during pregnancy is safe?	No	47	47.0%
	Yes	53	53.0%
	Total	100	100.0%
2. Do you know that minor dental treatment can be carried out during pregnancy?	No	61	61.0%
	Yes	39	39.0%
	Total	100	100.0%
3. When do you think is the best time to undergo any dental treatment?	wrong	58	58.0%
	Right	42	42.0%
	Total	100	100.0%
4. How can you prevent gum diseases?	wrong	42	42.0%
	Right	58	58.0%
	Total	100	100.0%
5. Do you know that swelling of gums can occur during pregnancy?	No	79	79.0%
	Yes	21	21.0%
	Total	100	100.0%

**Response to Awareness Questions**

The mean awareness level was around 1.00 (29%) [Table-3] [Fig-1]. About 75% of participants were not aware about the importance of dental check-up during pregnancy and 48% of them fear that dental treatment can affect the health of newborn. 72% of participants were not aware about the oral health practices to be considered during pregnancy [Table-4]. Among the subjects having good knowledge regarding pregnancy and periodontal health, 63% had inadequate awareness and among those who had poor knowledge, 71.9%

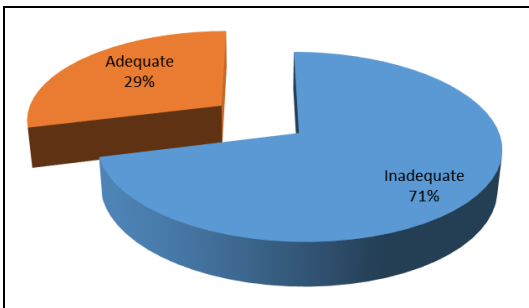
had inadequate awareness. There is no significant association between knowledge and awareness  $P=0.568>0.05$ .

**Table 3**

		No of subjects	%	Mean	Std deviation
awareness	Inadequate	71	71.0%	1.00	0.888
	Adequate	29	29.0%		
	Total	100	100%		

**Table 4**

Awareness		No. of subjects	%
1. Are you aware of the importance of dental check up during pregnancy?	No	75	75.0%
	Yes	25	25.0%
	Total	100	100.0%
2. Do you fear that dental treatment may affect the health of the newborn?	No	52	52.0%
	Yes	48	48.0%
	Total	100	100.0%
3. Are you aware of the oral health practices to be considered during pregnancy?	No	72	72.0%
	Yes	28	28.0%
	Total	100	100.0%



**Perceived Dental Experiences**

Out of the total participants, 46% of them had never visited a dentist and majority of the participant's oral hygiene practice was found to be very poor. About 29% of participants had experienced gum bleeding and 45% of them had noticed foul smell originating from their mouth during pregnancy. Nearly one third of study population had perceived signs of dental disease during pregnancy but only in 24% of subjects, gynaecologists recommended oral check up during pregnancy [Table-5].

**Table 5**

		No. of subjects	%
1. Do you brush your teeth daily?	No	8	8.0%
	Yes	92	92.0%
	Total	100	100.0%
2. Do you brush your teeth after every meal?	No	91	91.0%
	Yes	9	9.0%
	Total	100	100.0%
3. Do you use any other oral hygiene aids other than tooth brush for cleaning your teeth?	No	59	59.0%
	Yes	41	41.0%
	Total	100	100.0%
4. Do you use any mouthwash regularly?	No	82	82.0%
	Yes	18	18.0%
	Total	100	100.0%
5. Have you ever been to any dental clinic?	No	46	46.0%
	Yes	54	54.0%
	Total	100	100.0%
12. Did you find any difficulty in oral hygiene maintenance during pregnancy?	No	58	58.0%
	Yes	42	42.0%
	Total	100	100.0%
13. Have you noticed any episodes of gum bleeding?	No	71	71.0%
	Yes	29	29.0%
	Total	100	100.0%
15. Have you experienced any foul smell originating from your mouth during pregnancy?	No	55	55.0%
	Yes	45	45.0%
	Total	100	100.0%
17. Have you felt loosening of teeth in your mouth?	No	61	61.0%
	Yes	39	39.0%
	Total	100	100.0%
18. Did you experience similar gum problems during your previous pregnancy?	No	84	84.0%
	Yes	16	16.0%
	Total	100	100.0%
19. Did your gynaecologist recommend oral check up during pregnancy?	No	76	76.0%
	Yes	24	24.0%
	Total	100	100.0%

## Discussion

Periodontal disease progression is usually unnoticed, and most people probably recognize it only when it reaches an advanced stage. Therefore, knowledge and awareness of periodontal diseases is important to control and maintain periodontal health. This study was undertaken to assess knowledge and awareness level among pregnant women about periodontal health. Pregnancy can be affected by inflammatory periodontal disease which may lead to premature labour or a low-birth weight infant [2].

The American Dental Association (ADA) suggests that during the first and third trimester of pregnancy, elective dental care should be avoided, if possible [7]. According to California Dental Association Foundation, the use of dental x-rays and local anesthesia for prevention, diagnosis, and treatment of oral diseases, are highly beneficial with no additional fetal or maternal risk when compared to the risk of not providing care [8]. The present study showed inadequate awareness among majority (71%) of the study population. The results of the present study were similar to study conducted by HA Alwaeli et al (2005) [1] and Shilpi et al. (2015) [9] who concluded that knowledge and awareness for pregnant women about their teeth and gingival condition is generally poor. Before and during pregnancy simple educational preventive programmes on oral self-care and disease prevention should be provided to improve oral health. A study conducted by Boggess et al. (2011) [10] concluded that oral health knowledge can vary according to maternal race or ethnicity in pregnant women. Their beliefs varied according to their education levels. Oral health knowledge among pregnant women and that of their children can be improved by oral health education as a part of prenatal care. In comparison with results found by Taani et al. [11] regarding the participants knowledge of periodontal health, similar results were found in the non-pregnant and pregnant women.

Preterm delivery continues to be one of the most significant unresolved problems of public health and perinatology and it is one of the strong predictors of infant mortality and morbidity. The exact pathophysiology of preterm delivery are unknown. Studies suggests that subclinical infections and chronic inflammation may be the reason for majority of preterm deliveries [12]. Periodontitis is the most prevalent infection of the oral cavity, and there are many evidences suggesting periodontal disease as a risk factor for preterm deliveries. Estimates suggest that about 18.2% of all Preterm Low Birth Weight cases may be attributable to periodontal disease [12]. The study conducted by Shenoy et al. [13] also agreed that periodontal disease in expectant mothers may lead to preterm low birth weight babies.

In our study only 11% of them had good knowledge and 89% of them had poor knowledge about periodontal health. This may be due to the low educational level of the patients. Also overall oral hygiene practice among the pregnant women was found to be very poor.

Low socio-economic status, inaccessibility to dental clinics, and unawareness of oral hygiene practices may be a reason for negligence of oral health [14].

Pregnancy does not cause gingivitis, but it can aggravate pre-existing disease. The most marked changes are seen in gingival vasculature. Characteristic feature of pregnancy gingivitis is that the gingiva becomes dark red, swollen, smooth and bleeds easily. Localized gingival enlargements may be seen in women with pregnancy gingivitis. The gingival changes usually resolve if local irritants are eliminated within few months after delivery. The

inflammatory changes are usually reversible and restricted to the gingival [15]. During pregnancy hormonal changes can cause exacerbation of periodontal or gingival clinical characteristics especially swelling and bleeding [16]. In the present study 29% of women experienced gum bleeding and 39% of them felt loosening of teeth.

The physician's knowledge about the association between pregnancy and oral health is also important. A study was done by Habashneh et al. [17] to assess the knowledge of healthcare providers and found out that general practitioners were less informed about oral health practices in pregnant women. Similarly another study done by Fouzia et al. [18] found that Gynecologists and General Medical Practitioners were less aware and unsupportive of the association between pregnancy and periodontal health compared with the dental health care providers. In our study 76% of the subjects were not recommended by gynaecologists about oral health check up during pregnancy as they were not aware about the gingival changes during pregnancy.

There are minor misconceptions amongst gynecologists regarding provision of dental treatments during pregnancy and this acts as a barrier for dentists in providing appropriate treatment to the pregnant patients. Clarification of such misconceptions is necessary in order to stop compromising on the quality of dental care. Multiple workshops on these subjects involving dental health care providers, gynaecologists and public health care providers should be organized at government/private institutional level. The limitation of this study was its reliance on self-reported data, which can lead to biases. The results of the study can improve oral health education in pregnant women receiving antenatal care.

## Conclusion

Despite several decades of major improvements in diagnostic and therapeutic systems used in antenatal care, the rates of many complications of pregnancy are not decreasing, including preterm birth. One of the reason for it can be the lack of awareness about the association between periodontal health and pregnancy outcomes. In this study awareness and knowledge level of periodontal health among pregnant women was found to be very low. Studies have to be performed to investigate any possible benefits from periodontal treatment before conception.

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