

# Knowledge, Attitude, Oral Hygiene Practices And Experience Of Oral And Periodontal Health Among Pregnant Females - A Cross Sectionals Study

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## Abstract:

**Introduction:** Dental Health is influenced in pregnancy due to hormonal fluctuation. Pregnant women have been shown to have a higher incidence of gingival inflammation than non-pregnant women. The high estrogen levels in pregnant woman is always responsible for periodontal inflammation, edema, high sensitivity and a tendency to bleed easily, and can cause pre-existing gingivitis to worsen considerably if plaque is not removed. To our knowledge very few Indian studies addressing the extent of pregnant women's knowledge regarding the associations between oral health and pregnancy outcome have been published. Therefore, the aim of the study is to evaluate the knowledge, attitude, oral hygiene practices and self-perception of oral and periodontal health among pregnant women's in and around Pune city.

**Aim and Objectives:** This questionnaire based cross sectional study was aimed to evaluate the knowledge, attitude, oral hygiene practices and experience of oral and periodontal health among pregnant females and its Correlate demographic status, Knowledge, attitude, oral hygiene practices and experience of oral and periodontal health among pregnant females.

**Methodology:** A pre-validated questionnaire based on knowledge, attitude, oral hygiene practices and experience of oral and periodontal health was circulated to 340 participants.

**Conclusion:** Study provided basic and important dental health knowledge, attitude, oral hygiene practices and experience of oral and periodontal health among pregnant females based in Pune and surrounding. More awareness programs and dental check-up camps should be conducted to improve their concern about oral and dental health and finely pregnancy outcomes.

**Keywords:** Pregnancy, Periodontal health, Awareness, Oral hygiene

**Introduction:** It has been always noted that dental health is mirror of general health and well-being. Dental health is influenced in pregnancy due to hormonal fluctuation.<sup>[1]</sup> Hormonal changes in pregnancy combined with neglected oral hygiene tend to increase the incidence of oral diseases like gingivitis.<sup>[2]</sup> Pregnant women have special oral health needs due to hormonal fluctuations (estrogen and progesterone), which have a strong influence on the oral cavity and periodontium.<sup>[3]</sup> Pregnant women have been shown to have a higher incidence of gingival inflammation than non-pregnant women.<sup>[4]</sup> The high estrogen levels in pregnant women is always responsible for periodontal inflammation, edema, high sensitivity and a tendency to bleed easily, and can cause pre-existing gingivitis to worsen considerably if plaque is not removed.<sup>[5]</sup>

To our knowledge very few Indian studies have been published addressing the extent of mothers' knowledge regarding the associations between oral health and pregnancy outcome. Therefore, the aim of the study was to evaluate the knowledge, attitude, oral hygiene practices and self-perception of oral and periodontal health among pregnant women in and around Pune city.

**Methodology:** This was a self-interviewed questionnaire based cross sectional, descriptive and analytical study. The necessary permissions were obtained from Institutional Ethical committee and the department of gynecology, Shrimati Kashibai Navale Medical College and Hospital, Pune to conduct the study. The duration of this Study was three months from Jan to Mar 2018. Consent forms and participant information sheets were obtained from the participants.

The questionnaire consisted of 25 questions which were categorized into five different categories (1) socio-demographic data (age, ethnicity, education and job status); (2) knowledge; (3) attitude, and (4) practice (5)

experience of pregnant women on oral and dental health.

Questions were formulated to assess the knowledge about association of various oral diseases such as gingivitis, periodontitis, dental caries and pregnancy. Also, knowledge about poor oral health status during pregnancy can make gingiva bleed, swell and red it is related with premature labor and low birth weight of babies, also increase requirement of calcium supplement during pregnancy. Questions regarding attitude helped to check attitude of participants regarding gingival problems and whether they feel dental visits are unnecessary or unpleasant, also to check whether the participants are in favor of self-medication for dental pain during pregnancy.

Questions on oral hygiene practice gathered the data about dental visit, whether the participants were following correct dental practices such as use of toothbrush, toothpaste, frequency, duration and manner of brushing, and use of interdental cleansing aids. In questions regarding experience, we have assessed data about the participants experience of oral health problems, gingival bleeding, halitosis, mobile teeth, or lost teeth during pregnancy.

The structured questionnaire of 25 questions was then distributed among 340 participants. The responses to these questions were noted and analyze using statistical tests.

#### **The questionnaire is as follows:**

Name: \_\_\_\_\_ Age: \_\_\_\_\_

Address: \_\_\_\_\_

Occupation: \_\_\_\_\_

Education: \_\_\_\_\_

#### **KNOWLEDGE**

1. Do you know that cavities and gum disease are caused by infection in the mouth?  
a. Yes b. No c. Don't know

2. Do you know that pregnancy makes your gums bleed, swell and become red?
  - a. Yes b. No c. Don't know
3. Are you aware that gum diseases are related with premature labour and low birth weight babies?
  - a. Yes b. No c. Don't know
4. Which of the following is the most common oral disease seen during pregnancy?
  - a. Crooked teeth b. Gum problem c. Tooth mobility d. Tooth cavities
5. Do you know calcium will be drawn out of your teeth by developing baby? / Do you require calcium supplement during pregnancy?
  - a. Yes b. No c. Don't know
6. Do you know periodontal problems can affect pregnancy outcome?
  - a. Yes b. No c. uncertain

#### ATTITUDE

7. Pregnancy is a cause of gum problem
  - a. Strongly agree b. Agree c. Uncertain d. Disagree e. Strongly Disagree
8. Dental visits are unnecessary during pregnancy
  - a. Strongly agree b. Agree c. Uncertain d. Disagree e. Strongly Disagree
9. Visit to dentist are always unpleasant
  - a. Strongly agree b. Agree c. Uncertain d. Disagree e. Strongly Disagree
10. Fruits and vegetables have no effect on the teeth and gums
  - a. Strongly agree b. Agree c. Uncertain d. Disagree e. Strongly Disagree
11. Self-medication for dental pain is advisable during pregnancy
  - a. Strongly agree b. Agree c. Uncertain d. Disagree e. Strongly Disagree

#### PRACTICE

12. Did you visit your dentist regularly before your pregnancy?
 

Yes	No
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13. How do you clean your teeth?
 

Brush/ finger/ neem stick/ other

If Brush,
14. What type of brush you use?
 

Soft/ Medium/ Hard
15. What do you use for cleaning your teeth?
 

Tooth paste / Tooth powder / Mishri (fine tobacco) / Ash
16. How many times you clean your teeth every day?
 

Once a day/ twice a day/ more than twice
17. How much time do you brush/ clean your teeth?
 

2 to 3 min / 3-5min / 5to10 min
18. What type of manner of brushing do you use?
 

Horizontal/ Vertical/ Circular
19. How frequent you change your tooth brush?
 

1to2 month/ 3to 4 month/ 5 and above
20. Do you use interdental cleansing aids to maintain oral hygiene?
 

Floss/ Interdental brush / None

#### EXPERIENCE

21. Did you experience any oral health problems during your pregnancy?
 

Yes	No
-----	----
22. Did you notice that your gums bleed during pregnancy?
 

Yes	No
-----	----
23. Do you feel bad breath during pregnancy?
 

Yes	No
-----	----
24. Did you feel loose teeth during pregnancy?
 

Yes	No
-----	----
25. Did you lose any tooth or teeth during pregnancy?
 

Yes	No
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**Result:** Responses obtained from the participants were tabulated and graphically represented about periodontal health awareness. Descriptive tabulations were done for age, ethnicity, education and job status which will help to analyze association within demographic data and periodontal health awareness.

The data was analyzed using the SPSS 21 for Windows statistical software package and was validated visually. Measures of central tendency were generated for continuous variables and frequency tables generated for categorical variables. The chi-squared test of association, and ANOVA test were utilized where appropriate and associations and differences were considered significant when the p-values were less than 0.05. Logistic regression analysis was done to identify possible factors influencing the oral health knowledge, attitude, oral hygiene practices and experience. Also, questionnaire was validated by authorized examiners.

The participants were divided into 4 age groups as 18 to 20 yrs, 21 to 30 yrs, 31 to 40 yrs, 41 to 50 yrs. After descriptive statistics the mean and standard deviation was calculated for total score about practice, knowledge and attitude (Table 1).

Statistical analysis was also done for job status, education level and ethnicity. Mean (S. D.) of total practice, knowledge, attitude score of women those who were working was 4.61 ( $\pm 1.333$ ), 1.28 ( $\pm 1.106$ ), 1.65 ( $\pm 1.010$ ) respectively. Mean (S. D.) of total practice, knowledge, attitude score of women those who had secondary schooling is 4.68 ( $\pm 1.323$ ), 1.22 ( $\pm 1.081$ ), 1.83 ( $\pm 1.017$ ) respectively. Mean (S. D.) of total practice, knowledge, attitude score of women those who reside at Pune is 4.61 ( $\pm 1.311$ ), 1.19 ( $\pm 1.055$ ), 1.70 ( $\pm 0.991$ ).

Results for each segment of questionnaire is described in tabular manner for knowledge, attitude, practice and experience

**Knowledge:** Out of 340 participants response for Q1 was 'Don't know' that was 158 (46.5%)

participants, whereas 128 (37.6%) said No and 15.9% said Yes. And this difference was statistically significant as  $p < 0.05$ , so we can see from this response that most of the participants not aware regarding cavities and gum disease are caused by infection in the mouth. Response for that pregnancy makes your gums bleed, swell and become red was 90 (26.5%) said 'Don't know', whereas 179 (52.6) said No and 20.9% said Yes. And this difference was statistically significant ( $p < 0.05$ ), most of the participants were said that pregnancy is not making my gums bleed, swell and become red showing poor knowledge. Response for Q3 was 262 (77.1%) don't know whereas 70 (20.6%) said No and 8 (2.4%) said Yes which shows lack of knowledge regarding relation between gum diseases and premature labor and low birth weight babies. For Q4 most of the participants replied gingivitis is commonly occurring disease 174 (51.2%) next to that dental caries 156 (45.9%), periodontitis 7 (2.1) and malocclusion 3 (0.9) during pregnancy. This shows participants having basic knowledge about common gum problems. Q5 shows response of don't know in 179 (52.6), whereas 72 (21.2%) said No and 26.2% said Yes. And this difference was statistically significant ( $p < 0.05$ ). Q6 response for periodontal problems can affect pregnancy outcome was don't know 152 (44.7%), whereas said no 175 (51.5%) and 3.8% said yes. And this difference was statistically significant ( $p < 0.05$ ). (Table 2)

Response for Q1 was asked, out of 340 participants 286 (84.1%) gave the incorrect response whereas 54 (15.9%) gave the correct response. And this difference was statistically significant ( $p < 0.05$ ). Response for Q2 showed 268 (78.8%) incorrect response whereas 72 (21.2%) gave correct response, and this difference was statistically significant ( $p < 0.05$ ). Response for Q3 332 (97.6%) gave incorrect and 8 (2.4) gave correct response. Incorrect Response for Q4, Q5 and Q6 was 166 (48.8), 268 (78.8), 327 (96.2) respectively and correct was 174 (51.2), 72 (21.2), 13 (3.8) respectively,

and difference were statistically significant ( $p < 0.05$ ). (Table 2)

**Attitude:** Attitude of 117(34.4%) participants about gum problems was very uncertain. Mostly 119(35.0%) participants were uncertain about dental visits are unnecessary during pregnancy also 241(70.9%) participants were uncertain about visit to dentist are always unpleasant. Attitude of 88(25.9%) participants were strongly agree that Fruits and vegetables have no effect on the teeth and gums while 80(23.5%) were uncertain and 99(29.1%) Strongly disagree. 285(83.8) participants were strongly disagreed for Self-medication for dental pain during pregnancy and 23(6.8) were uncertain. (Table 3)

**Practice:** When we encountered participants with oral hygiene practices Q.12 dental visit regularity, 306(90%) said 'No' as incorrect replied 306(90%) whereas 34(10%) as correct replied said 'Yes'. And this difference was statistically significant ( $p < 0.05$ ). when asked how participants clean their teeth, we got 330(97.1%) correct replied as they were using brush and 10(2.9%) incorrect replied as they said use of finger. Most of the participants 217(63.8%) were using soft type of brush, 98(28.8) medium type and 25(7.4) hard type of brush in that 133 (39.1%) replied incorrect and 207 (60.9%) replied correct. When asked about dentifrices we got 321 (94.4%) replied for toothpaste which is correct and 19 (5.6) replied for tooth powder which is incorrect reply. When asked about frequency of brushing 236 (69.4%) participants replied for twice brushing which is

correct response and remaining participants gave incorrect response 104 (30.6%).

When asked about duration of brushing 111 (32.6%) participants gave correct response for 2-3 min. and remaining 229 (67.4%) gave incorrect response for 3-5 and 5-10 min. 86 (25.3%) participants were using correct circular manner of brushing and remaining 254 (74.7%) participants gave incorrect response for horizontal and vertical brushing. Out of 340 participants 106 (31.2%) use of change their tooth brush on 3-4 months as it's a correct response and remaining 234(68.8%) participants use to change their brush after 1-2 months or 5 or above months which is incorrect response. Out of 340 participants none of the participants used any type of interdental cleansing aids. And this difference was statistically significant ( $p < 0.05$ ). (Table 4)

When response asked about any oral health problems during your pregnancy 277(81.5%) participants said No and 63(18.5%) said Yes. Out of 340 participants 271(79.7%) replied No for gum bleeding during pregnancy and 69(20.3%) replied yes. When asked about bad breath during pregnancy 285(83.8%) replied no and 55(16.2%) replied yes. Out of 340 participants only 17(5%) experienced loose teeth during pregnancy while 323(95%) participants don't. out of 340 participants none experienced lose any tooth or teeth during pregnancy. This difference was statistically significant ( $p < 0.05$ ). (Table 5)

So, the mean knowledge score was found to be  $1.12 \pm 1.218$ , the mean attitude score was  $16.25 \pm 2.349$  and the mean practice score was  $4.21 \pm 1.342$ . (Table 6)

Table:1

Age		Total Practice score	Total knowledge score	Total attitude score
18 - 20	Mean	4.40	1.04	1.79
	N	85	85	85
	SD	1.293	1.017	.965
	Mean	4.97	1.28	1.68

21 - 30	N	68	68	68
	SD	1.171	1.020	.953
31 - 40	Mean	4.55	1.27	1.69
	N	153	153	153
	SD	1.362	1.114	1.053
41 - 50	Mean	4.74	1.29	1.71
	N	34	34	34
	SD	1.333	1.219	1.031
Total	Mean	4.61	1.22	1.71
	N	340	340	340
	SD	1.315	1.083	1.006

Knowledge (Table 2)

Question	Response	Frequency (%)	P value
1. Do you know that cavities and gum disease are caused by infection in the mouth?	Yes	54(15.9)	0.000
	No	128(37.6)	
	don't know	158(46.5)	
	Incorrect	286(84.1)	
	Correct	54(15.9)	
2. Do you know that pregnancy makes your gums bleed, swell and become red?	Yes	71(20.9)	0.000
	No	179(52.6)	
	don't know	90(26.5)	
	Incorrect	268(78.8)	
	Correct	72(21.2)	
3. Are you aware that gum diseases are related with premature labor and low birth weight babies?	Yes	8(2.4)	0.000
	No	70(20.6)	
	don't know	262(77.1)	
	Incorrect	332(97.6)	
	Correct	8(2.4)	
4. Which of the following is the most common oral disease seen during pregnancy?	malocclusion	3(.9)	0.000
	Gingivitis	174(51.2)	
	periodontitis	7(2.1)	
	dental caries	156(45.9)	
	Incorrect	166(48.8)	

	Correct	174(51.2)	
5. Do you know calcium will be drawn out of your teeth by developing baby? / Do you require calcium supplement during pregnancy?	Yes	89(26.2)	0.000
	No	72(21.2)	
	don't know	179(52.6)	
	Incorrect	268(78.8)	
	Correct	72(21.2)	
6. Do you know periodontal problems can affect pregnancy outcome?	Yes	13(3.8)	0.000
	No	175(51.5)	
	don't know	152(44.7)	
	Incorrect	327(96.2)	
	Correct	13(3.8)	

Attitude (Table 3)

Question		Frequency
1. Pregnancy is a cause of gum problem	Strongly agree	118(34.7)
	Agree	55(16.2)
	Uncertain	117(34.4)
	Disagree	37(10.9)
	Strongly Disagree	13(3.8)
2. Dental visits are unnecessary during pregnancy	Strongly agree	57(16.8)
	Agree	17(5.0)
	Uncertain	119(35.0)
	Disagree	49(14.4)
	Strongly Disagree	98(28.8)
3. Visit to dentist are always unpleasant	Strongly agree	26(7.6)
	Agree	15(4.4)
	Uncertain	241(70.9)
	Disagree	23(6.8)
	Strongly Disagree	35(10.3)
4. Fruits and vegetables have no effect on the teeth and gums	Strongly agree	88(25.9)

	Agree	69(20.3)
	Uncertain	80(23.5)
	Disagree	4(1.2)
	Strongly Disagree	99(29.1)
5. Self-medication for dental pain is advisable during pregnancy	Strongly agree	13(3.8)
	Agree	4(1.2)
	Uncertain	23(6.8)
	Disagree	15(4.4)
	Strongly Disagree	285(83.8)

PRACTICE (Table 4)

Question	Response	Frequency (%)	P value
1. Did you visit your dentist regularly before your pregnancy?	Yes	34(10)	0.000
	No	306(90)	
	incorrect	306(90)	
	Correct	34(10)	
2. How do you clean your teeth?	Brush	330(97.1)	0.000
	Finger	10(2.9)	
	incorrect	10(2.9)	
	Correct	330(97.1)	
3. What type of brush you use?	Soft	217(63.8)	0.000
	medium	98(28.8)	
	Hard	25(7.4)	
	incorrect	133(39.1)	
	Correct	207(60.9)	
4. What do you use for cleaning your teeth?	toothpaste	321(94.4)	0.000
	tooth powder	19(5.6)	
	incorrect	19(5.6)	
	Correct	321(94.4)	
5. How many times you clean your teeth every day?	once a day	83(24.4)	0.000



	twice a day	236(69.4)	
	more than twice	21(6.2)	
	incorrect	104(30.6)	
	Correct	236(69.4)	
6. How much time do you brush/ clean your teeth?	2-3 mins	111(32.6)	0.000
	3-5 mins	118(34.7)	
	5-10 mins	111(32.6)	
	incorrect	229(67.4)	
	Correct	111(32.6)	
7. What type of manner of brushing do you use?	horizontal	203(59.7)	0.000
	Vertical	51(15.0)	
	Circular	86(25.3)	
	incorrect	254(74.7)	
	Correct	86(25.3)	
8. How frequent you change your tooth brush?	1-2 months	206(60.6)	0.000
	3-4 months	106(31.2)	
	5 months and above	28(8.2)	
	incorrect	234(68.8)	
	Correct	106(31.2)	
9. Do you use interdental cleansing aids to maintain oral hygiene?	None	340(100)	-

## EXPERIENCE (Table 5)

Question	Response	Frequency (%)	P value
12. Did you experience any oral health problems during your pregnancy?	No	277(81.5)	0.000
	Yes	63(18.5)	
13. Did you notice that your gums bleed during pregnancy?	No	271(79.7)	0.000
	Yes	69(20.3)	
14. Do you feel bad breath during pregnancy?	No	285(83.8)	0.000

	Yes	55(16.2)	
15. Did you feel loose teeth during pregnancy?	No	323(95)	0.000
	Yes	17(5)	
16. Did you lose any tooth or teeth during pregnancy?	No	340(100)	-

Mean Knowledge, Attitude and Practice score(Table 6)

	Mean	Std. Deviation
Total Knowledge score	1.12	1.218
Total Attitude score	16.25	2.349
Total Practice score	4.21	1.342

**Discussion:** This questionnaire based cross sectional study revealed the knowledge, attitude, oral hygiene practices and experience of oral and periodontal health among participants and its association with demographic status. There were studies in the literature stating gingivitis were significantly higher in pregnant than in non-pregnant women. [6,7,8] The reason behind this could be related to altered immune response due to stress and anxiety or ignored oral hygiene leading to deterioration of women's oral health.<sup>[9]</sup> other than this role endocrine system and its direct effect on oral tissues have been well documented.<sup>[10]</sup> Increased rate of estrogen metabolism and synthesis of prostaglandins were found to contribute in gingival changes observed during pregnancy.<sup>[10]</sup> Altered levels of progesterone and estrogen have been shown to affect the pattern and rate of collagen production in the gingiva. This reduces body's ability to repair and maintain gingival tissues. [11, 12, 13]

Periodontal disease is common oral disease which we can be prevented during pregnancy just by implementing few oral hygiene measures like regular twice tooth-brushing and flossing. [14, 15, 16, 17] Provoking women for oral and dental health helps to improve and prevent pregnancy outcome Thus, this study was designed to provide a better view

of periodontal and oral health awareness among pregnant females.

This study had total 95 participant resident of Pune between the age group of 31 to 40 years where majority of them had completed secondary schooling and around 64% were employed. We observed that there was paucity of knowledge dental caries and gingival diseases among these participants only 16% showed positive response. Also, maximum participants responded that pregnancy has no role in gingival bleeding, swelling or become red thus participants need to be educated about hormonal changes during pregnancy. Participants are not aware that periodontal diseases are related with premature labor and low birth weight babies, which is proven threat during pregnancy. There is a research paper published in 2015 demonstrating a strong association between periodontitis and pre-term LBW infants and it has been explored with many other studies both in animal and humans.<sup>[18]</sup> Thus participants have limited knowledge and awareness regarding periodontal disease, and its effect on the pregnancy and adverse pregnancy outcomes. Participants had no knowledge about calcium requirement during pregnancy.

Attitude of most of the participants toward gum problems during pregnancy was uncertain. Participants were uncertain about dental visits are necessary or unnecessary

during that period. There were 26% participants strongly agree that fruits and vegetables have no effect on the teeth and gums which shows their casual attitude toward nutritional values and ignoring general health. But attitude toward self-medication were very positive in that 83% participants strongly disagree that they should not self-medicate during pregnancy.

A majority participant had good knowledge and information about oral hygiene practices. But they don't have regular dental check-ups. Maximum participants use toothbrush and toothpaste with twice brushing practice. There is lag about brushing technique and duration of brushing. Also, participants needed proper education about when to change the toothbrush. All the participants need to reinforce for using interdental cleansing aids.

**Conclusion:** Participants in this region had good knowledge and information about oral hygiene practices but poor in general health. They have limited knowledge and awareness regarding periodontal disease, and which may affect pregnancy outcomes. Participants need to be educated about hazards of gingival and periodontal diseases during pregnancy

There should be education centers for pregnant women in the gynecology department. Longitudinal studies will help to keep track of pregnancy outcome and also helps to keep data to assess the long-term effect of oral health education programs in maternity care centers on dental health knowledge and behavior of pregnant women.

Regular referral from gynecology department for regular dental check-up will help to monitor overall oral health during pregnancy and minimize pregnancy complications like premature labor.

**Corresponding author statement:** All the authors have equally contributed to this research work and there is no conflict of interest among the authors.

**Sources of funding:** None

**Conflict of interest:** None

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