



# Comparative Evaluation Of Oral Health Knowledge, Attitude And Practices Of Pregnant And Non-Pregnant Women In Udaipur City, Rajasthan, India

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## ARTICLE INFO

## ABSTRACT

**Aim:** The aim of the present study was to evaluate the oral health knowledge, Practices and attitude of pregnant and non- Pregnant women in Udaipur city, Rajasthan, India.

**Methods:** The Analytical cross-sectional questionnaire-based survey study was conducted on the pregnant and non-pregnant women of Udaipur city were included in this study from April 2022-March 2023. The present study was approved by the Institutional Ethics Committee. 250 women were included in the study.

**Results:** In the present study, majority of the women belonged to the age group 20-29 years. Most of the women in both the groups had education at secondary level. Majority of the women were housewives in the study. The variables showed a statistically significant association with Education. All women were agreed in terms of cleaning of teeth. Majority of the women used toothpaste for brushing. Most of the women change toothbrush after every 3-5 months. Maximum of the participants rinsed after meals. Majority of women of both groups (97.5% of Group A and 94% of Group B respectively,  $p > 0.05$ ) were of the opinion that if they were made aware about the relationship of oral and overall health, they would have been more careful in maintaining a good oral health. Among pregnant women (Group B): 25.8% had history of abortion and 14.7% reported that their previous child was born prematurely.

**Conclusion:** This study revealed that the level of education and socioeconomic status was significantly associated with oral health attitude and practice. In the context of oral health during pregnancy, an add-on to the awareness about health care and associated preventive measures, better positive attitudes can always be achieved at every step. Education on effective tooth brushing to prevent periodontal diseases and its impact on their newborns is needed in the current population, especially in rural areas.

**Keywords:** oral health knowledge, Practices, attitude of pregnant and non-Pregnant women, Udaipur city

## 1. INTRODUCTION

It has been suggested that periodontal disease during pregnancy could have a causal relationship with low birth weight (LBW) babies and other adverse pregnancy outcomes. Premature delivery implies labour that occurs at

fewer than 37 complete weeks of gestation and is generally accompanied by Low Birth Weight <2500 gm.<sup>1</sup> It is important to emphasize that non-specific, general inflammatory mediators induced by periodontal disease are the same ones that play an important role in initiation of labour. In a normal parturition, labour occur when there is an increased level of inflammatory cytokines such as IL-1, TNF- $\alpha$ , and PGE2 in placenta. In case of periodontitis, due to increased bacteraemia there are prematurely raised levels of the inflammatory mediators which are involved in normal parturition, leading to premature rupture of placental membrane causing premature birth.<sup>2-4</sup>

Moreover, microbiological data indicate that primary microorganisms, associated with mature plaque and progressing, periodontitis- *Bacteriodes forsythus*, *Porphyromonas gingivalis*, *Aggregatibacter actinomycetemcomitans* and *Treponema denticola* were detected at higher levels in mothers with PLWB babies as compared to normal birth weight (NBW) controls.<sup>5-7</sup> This association has further been proved by finding higher mid-trimester maternal serum antibody levels against these micro-organisms specially *Porphyromonas gingivalis* and *Capnocytophaga*.<sup>8,9</sup> Thus it is logically reasonable as well as biologically plausible to hypothesize that periodontal infection contributes to adverse pregnancy outcomes in the form of premature delivery.

Oral hygiene during pregnancy has been acknowledged globally as a significant health issue. Studies reported various oral pathologies amongst pregnant women.<sup>10</sup> Gingivitis is one of the most common periodontal diseases characterized by inflammation of the gingiva under the influence of bacterial plaque. Dental plaque is a prime etiological agent for dental caries and periodontal disease. During pregnancy, gingiva shows an exaggerated inflammatory response to bacterial plaque, attributed to the increased level of hormones (mainly estrogen and progesterone).<sup>11,12</sup> Periodontal disease is preventable and treatable. The key objective of oral health care in pregnancy is to produce a healthy environment with good oral hygiene practices (like tooth-brushing, flossing) and professional oral prophylaxis, including scaling and root planing.<sup>11</sup>

Recently, various studies showed a relationship between periodontal disease and adverse pregnancy outcomes such as preterm low birth weight, premature births, and pre-eclampsia.<sup>12-14</sup> A systematic review of 25 studies identified that periodontal infections might be associated with adverse pregnancy outcomes.<sup>15</sup> An Australian study concluded that women with miscarriages compared to women with full-term babies and live-born infants were likely to have four times more periodontal disease.<sup>16</sup>

The aim of the present study was to evaluate the oral health knowledge, Practices and attitude of pregnant and non- Pregnant women in Udaipur city, Rajasthan, India.

## 2. MATERIALS AND METHODS

The Analytical cross-sectional questionnaire-based survey study was conducted on the pregnant and non-pregnant women of Udaipur city were included in this study from April 2022-March 2023. The present study was approved by the Institutional Ethics Committee. 250 women were included in the study.

**Informed consent:**

The questionnaire was verbally explained in the local language to illiterate women and those facing any problem. The protocol of the study was explained to all the participant women and written consent was obtained.

**Sample Size Determination:**

Sample size was estimated based on the results of the pilot study. The standard deviation of the difference in knowledge scores between the pregnant and non-pregnant groups was 3.5, while the mean difference was 0.93. The projected sample size, with a power of 80% and a 95% confidence interval, was calculated to be 250 subjects in each group.

**Sample selection and sampling:**

There were total of six medical colleges and hospitals in Udaipur city out of which six medical colleges, two was randomly selected and pregnant and non-pregnant women attending was included in the study till sample size is achieved.

Patients visited the outpatient department of all the selected hospitals were randomly assigned to Group A (non-pregnant women) or Group B (pregnant women) participated in the research.

**Data collection**

The questionnaire survey was used to acquire the data for this investigation. The questionnaire was broadly divided into four parts:

(1) Socio-demographic data

(2) Knowledge;

(3) Attitude

(4) Practice regarding oral health care.

**Validity and reliability of the questionnaire**

Cronbach's alpha was used to determine the reliability of the test based on the pilot study's completed questionnaires. The reliability coefficient for the questionnaire was more than 0.7, demonstrating its validity and suitability for the current research. Senior faculty from department of public health dentistry and periodontia verified the reliability and validity of the questionnaire's format. When women were unable to read the questionnaire, it was explained to them orally in their native

**Statistical Analysis:**

The percentage distribution of discrete categories was shown as n. Pearson's chi-square test was carried out in order to compare the category data. The threshold of statistical significance used in all tests was =0.05 and all tests were two-tailed. A Windows version of SPSS (20.0; SPSS Inc., Chicago, IL, USA) was used for the statistical analysis.

### 3. RESULTS

**Table 1:** Characteristics of the participants

Characteristics	Pregnant (%) N=250	Non-Pregnant (%) N=250
<b>Age (In Years)</b>		
20-29	79.2	47.2
30-39	20	35.2
40-50	0.8	17.6
<b>Education</b>		
No formal education	5.5	16
Primary school	14.5	24.5
Secondary school	48.5	34
Graduates	16	18.5
Post- Graduates	15	7
<b>Employment Status</b>		
Self employed	1	11
Government Jobs	3.5	9.5
Private Jobs	7	16
Housewife	88.5	63.5

In the present study, majority of the women belonged to the age group 20-29 years. Most of the women in both the groups had education at secondary level. Majority of the women were housewives in the study.

**Table 2:** Response rate

Characteristic		No formal education	Primary school	Location	Size	Type	p-value
How often do you think the teeth should be brushed?							
Pregnant	(n) correct response	15	20	78	30	32	
Pregnant	(n) incorrect response	5	18	35	10	6	0.061
Non-Pregnant	(n) correct response	20	32	38	34	10	
Non-Pregnant	(n) incorrect response	25	28	40	14	10	0.018*
In your opinion, which is the best method for cleaning the teeth?							
Pregnant	(n) correct response	18	32	105	38	34	
Pregnant	(n) incorrect response	0	8	4	3	3	0.067
Non-Pregnant	(n) correct response	40	54	78	43	18	
Non-Pregnant	(n) incorrect response	10	7	5	0	0	0.004*
Which food can lead to dental caries?							
Pregnant	(n) correct response	10	20	65	28	30	
Pregnant	(n) incorrect response	8	23	45	15	8	0.001*
Non-Pregnant	(n) correct response	26	43	60	40	19	
Non-Pregnant	(n) incorrect response	20	15	20	5	0	0.10
In your opinion, when teeth start to decay, what is the treatment?							
Pregnant	(n) correct response	2	9	32	24	32	
Pregnant	(n) incorrect response	15	27	82	18	10	0.000*
Non-Pregnant	(n) correct response	10	23	34	28	15	
Non-Pregnant	(n) incorrect response	32	38	43	22	4	0.000*
What is calculus?							
Pregnant	(n) correct response	0	7	7	12	8	
Pregnant	(n) incorrect response	18	30	99	30	36	0.005*
Non-Pregnant	(n) correct response	15	17	20	14	6	
Non-Pregnant	(n) incorrect response	32	52	60	25	12	0.683
Do you think oral health has any role in overall health?							
Pregnant	(n) correct response	16	24	78	32	30	
Pregnant	(n) incorrect response	2	15	30	10	5	0.141
Non-Pregnant	(n) correct response	15	25	50	35	20	
Non-Pregnant	(n) incorrect response	25	36	32	15	7	0.001*

The variables showed a statistically significant association with Education.

**Table 3:** Frequency distribution of the participants according to oral hygiene habits

Characteristics	Pregnant (%)	Non-Pregnant (%)
<b>Do you clean your teeth</b>		
Yes	100	100
No	0	0
<b>Means of cleaning teeth</b>		
Manjan	1.5	1
Neem Datun	0.0	3.5
Tooth Powder	0.0	4
Tooth Paste	98.5	91.4
<b>Frequency of changing toothbrush</b>		
Every month	12.6	21.8
Every 3-5 months	26.1	39.9
Every 6-12 months	23.6	16.5
When bristles lose alignment	37.7	21.8
<b>Do you rinse after meals</b>		
Yes	95.5	91.5
No	4.5	8.5

All women were agreed in terms of cleaning of teeth. Majority of the women used toothpaste for brushing. Most of the women change toothbrush after every 3-5 months. Maximum of the participants rinsed after meals.

**Table 4:** Assessment of awareness of both the groups regarding oral and systemic inter- relationship

Questions asked	Options given	Pregnant (%)	Non-Pregnant (%)	p-values
Oral health has any role in overall health	Yes	77.4	56.0	0.010
	No	3.5	22.5	0.001**
	Do not know	14.6	15.0	0.896
	Never heard of it	4.5	6.5	0.394
Did your physician tell you about the impact of oral health on systemic health	Yes	4.0	4.0	0.003
	No	96.0	96.0	0.959
If yes, what diseases are related to oral health	Diabetes	29.2	0	0.673
	Heart attack	4.2	18.8	0.317
	Pregnancy outcome	4.2	37.5	.059
	All of the above	62.5	43.8	0.088
How important is oral health	Very important	71.9	76.5	0.673
	Not important	1.5	1.5	0.317
	Does not matter	0	1.0	0.059
	Somewhat important	26.6	21.0	0.088
Are you suffering from any systemic disease	Yes, heart disease	0	5.6	0.655
	Yes, diabetes	1.0	2.5	0.876
	Yes, both	0	0.5	-
	None	98.5	88.9	0.349
	Suffering from disease and isn't under medication	0.5	2.5	0.102
Do you go for regular medical check-up	Yes	20.1	21.5	0.742
	No	79.9	78.5	0.955
Do you for regular dental check up	Yes	6.1	10.5	0.117
	No	93.9	89.5	0.714
When did you last visit dentist	Last week	0	2.5	0.564
	Last month	2.5	11.6	0.001**
	Last 3-6 months	1.5	11.6	0.001**
	6 months-1 year	15.2	11.1	0.267
	More than 1 year	22.2	23.1	0.833
	Never	58.6	40.2	0.010**
What influences the frequency of your visit to dentist	Fear	1	6.95	0.005**
	Cost	0.5	3.2	0.059
	Lack of time	5.7	10.6	0.106
	No need	91.7	79.4	0.150
	Yes	97.5	94.0	0.798
	No	0	0.5	
	Do not know	2.5	5.5	.134

Majority of women of both groups (97.5% of Group A and 94% of Group B respectively,  $p > 0.05$ ) were of the opinion that if they were made aware about the relationship of oral and overall health, they would have been more careful in maintaining a good oral health.

**Table 5:** Assessment of knowledge regarding correlation of oral health to adverse pregnancy outcomes in pregnant females

Parameter	Variables	Percentage %
History of pregnancy	First pregnancy	38.4
	Twice	11.6
	Thrice	49.0
	More than thrice	0.5
Any history of abortion	Yes	25.8
	No	70.7
Weight of your previous child at the time of birth	>1.5 kg	5.0
	1.6-2.0 kg	11.3
	2.1-2.5 kg	27.5
	2.6-3 kg	36.3
	<3.1 kg	20
Was your child born prematurely	Yes	14.7
	No	85.3
Are you diabetic	Yes, before pregnancy	3
	Yes, after pregnancy	5.6
	No	88.9
	Do not know	1.0
Do you think there is a correlation between oral health and pregnancy outcome	Yes	18.2
	No	22.2
	Never heard of this	58.6
History of gum enlargement during pregnancy	Yes	7.6
	No	87.9
	Don't know	4.0
Do your gums bleed	Yes	23.2
	No	74.2
	Don't know	2.0
Have you consulted a dentist for your bleeding gums	Yes	4.5
	No	94.4
	Yes	6.6
	No	66.2
Do you think visiting a dentist during pregnancy is safe	Yes	76.3
	No	23.2
	Do not know	26.8
Do you think pregnancy is a cause of loosening of teeth	Yes	17.2
	No	82.3
Do you believe that after delivery teeth shouldn't be brushed	Yes	40.9
	No	52.5
	Don't know	6.1
Do you think that treatment of dental related problems during pregnancy is safe	Yes	57.1
	No	41.9

Among pregnant women (Group B): 25.8% had history of abortion and 14.7% reported that their previous child was born prematurely.

#### 4. DISCUSSION

The journey of pregnancy for a woman, designated as a unique state, is conjoined with an untold of physiological, emotional, and physical changes that increase a woman's susceptibility to oral conditions.<sup>17</sup> These conditions are mainly gingivitis, periodontitis, which have been reported to range between 36% to 100%<sup>18</sup> and other being benign gingival lesions, tooth mobility, tooth erosion and dental caries. Numerous studies have shown that the maternal oral health has significant implications for birth outcomes and infant oral health.<sup>19,20</sup> Maternal oral flora is transmitted to the newborn infant, and the increase in cariogenic flora in the mother predisposes the infant to the development of caries.<sup>21</sup>

One of the main findings in the present study was that the majority of pregnant women (96%) had not been educated by the gynaecologist about the impact of oral health on pregnancy outcomes. These findings coincide with that of Gunay et al., who conducted a German study and found that 71% had received no information regarding oral hygiene during pregnancy.<sup>22</sup> Similar results were seen in a UK study which reported that only 25% of the women had received specific advice concerning their teeth and pregnancy, mostly related to gingival and periodontal health.<sup>23</sup>

In our study, pregnancy did little to change future attitudes to dental care. The difference between oral health knowledge, attitude and practices among pregnant and non-pregnant female population was statistically non-significant. There was no gain in knowledge by the females after conceiving. The expecting mothers had not been educated regarding the role of periodontal diseases in adverse pregnancy outcomes or regarding the importance of regular dental check-ups. It is a cause of concern that many medical professionals are unfamiliar with the oral cavity and oral health research. We must reach out to the medical community to improve patient care through education & communication. It is our duty as periodontists to educate, motivate and reinforce our medical counterparts and the patients regarding the same.

Another crucial finding was that there were several myths related to dentistry still prevalent in India. A 52.5% opined that teeth should not be brushed after pregnancy, 23.4% were of the opinion that visiting a dentist during pregnancy was not safe and 17.2% were of the opinion that pregnancy is a cause of loosening teeth. A total of 40.9% believed that after delivery teeth should not be brushed, and another 41.9% thought dental treatment to be unsafe during pregnancy. Majority of studied population feel that there is no need to visit a dentist. These findings are in agreement with the findings of the study among pregnant women in USA.<sup>24</sup>

In a study on 95 pregnant women of Darussalem, Bamaniker and Kee reported that although 96.8% of the respondents agreed that women should have a dental check-up during pregnancy, only 55.9% actually practiced this. This raises serious concern since pregnant women may need extra oral and dental care due to susceptibility to gum diseases during pregnancy, which may contribute to low birth weight babies and premature births.<sup>25</sup> The results of our study are in accordance with those of Avula H et al<sup>26</sup>, who conducted a KAP assessment of oral health and adverse pregnancy outcomes among 359 pregnant women visiting three maternity care centres in Hyderabad, India, 87.2% of their respondents were not aware of the importance of oral hygiene and its probable association with adverse pregnancy outcomes. None of the respondents ever used dental floss and only a few (1.4%) had heard about it.

In a study done by Chacko, he reported that only 17% subjects feel the need of regular dental visits.<sup>40</sup> Regarding safety concern in a study 72% of pregnant women believed that dental treatment during pregnancy may not be safe.<sup>27</sup> While on contrary a study done by Katherine stated that 84% pregnant ladies consider dental visit safe during pregnancy.<sup>28</sup> Although periodontal disease profile differs from one population to another, studies have reported that African and Asian populations suffered more severe periodontal disease than other population.<sup>29,30</sup> The awareness regarding dental plaque and gum diseases and its relation on infant's oral health was found to be inadequate among rural group. A women's lack of receiving routine dental care when not pregnant is the most significant predictor of lack of receiving care during pregnancy as was found.<sup>31</sup> Besides neglecting medical care during pregnancy, most expectant females of all ages do not seek dental care even though half of them have a dental disease.<sup>32</sup> In order to promote health, it is necessary for the would-be - mothers to be aware of disease symptoms and to be encouraged to adopt appropriate health behaviour.

## 5. CONCLUSION

Knowledge is power and information is liberating. Education is the premise of progress in every society, in every family. Counseling for the pregnant women includes general and oral changes that may occur during pregnancy and infant oral health care. This study revealed that the level of education and socioeconomic status was significantly associated with oral health attitude and practice. In the context of oral health during pregnancy, an add-on to the awareness about health care and associated preventive measures, better positive attitudes can always be achieved at every step. Education on effective tooth brushing to prevent periodontal diseases and its impact on their newborns is needed in the current population, especially in rural areas. Apart from the benefit to the health of the women, mothers play a crucial role in transferring and demonstrating health habits to their children; therefore, pregnant women should be a target group for oral health education.

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