

# Awareness of Periodontal Diseases and its Associated Adverse Pregnancy Outcomes among Pregnant Women attending a Tertiary Care Center

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## ABSTRACT

### Introduction:

Periodontal diseases are associated with high levels of gram-negative periodontal pathogens that apparently increase abundantly in the presence of pregnancy-associated hormones. Endotoxins from gram-negative bacteria enter the circulation at high levels to stimulate the production of inflammatory mediators, such as prostaglandins and other inflammatory mediators which are potent inducers of labor. The present study was conducted to assess oral health awareness and experience among pregnant women attending a tertiary care hospital.

### Methods:

A cross-sectional study was conducted in 167 pregnant women visiting a tertiary care center using self-administered structured questionnaire consisting of questions related to knowledge and awareness regarding periodontal diseases and its possible associated adverse pregnancy outcomes.

### Results:

Of the total participants, 55.7% said that they did not think gum disease can have adverse pregnancy outcomes. Only 35.9% had, at some point, consulted a dentist for bleeding gums and 36.5% of them had gingival enlargement during pregnancy but 46.1% said that they should wait for the delivery before they could do any dental treatment. Also, 40.1% did not know the safe trimester to undergo dental treatment and only 20.4% said the second trimester was the safest to undergo any dental procedure.

### Conclusion:

The study showed that awareness and knowledge of periodontal health among pregnant women was not satisfactory.

**Keywords:** Awareness; adverse pregnancy; periodontal disease; pregnancy outcomes.

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## INTRODUCTION

Periodontal diseases are attributed to interactions between the host immunity and multiple microbial species, including multiple gram-negative microaerophilic and anaerobic bacteria like Porphyromonas gingivalis, Fusobacterium nucleatum, Prevotella intermedia, Aggregatibacter actinomycetemcomitans, Treponemadenticola, etc. in the subgingival environment.<sup>1</sup> Microbiological studies have shown that estrogen and progesterone changes associated with pregnancy affects the composition of the subgingival microbiota.<sup>2, 3</sup> Some of the periodontal pathogens that apparently increase abundantly in the presence of pregnancy-associated hormones are Prevotella intermedia, Bacteroides species and Campylobacter rectus.<sup>4</sup>

Endotoxins from gram-negative bacteria enter the circulation at high enough levels to stimulate the production of inflammatory mediators, such as prostaglandin E2,<sup>5</sup> which are potent inducers of labor. Studies have also found that periodontal therapy resulted in a significant reduction in adverse pregnancy outcomes.<sup>6,7</sup> If periodontal infections are truly important in the pathogenesis of adverse pregnancy outcomes, treatment of these infections should reduce the incidence of these outcomes.<sup>7</sup>

The present study aims to assess oral health awareness and experience among pregnant women attending a teaching hospital. The objective of the study is to create awareness of the importance of oral health in pregnancy and to encourage pregnant ladies to visit dental clinics during pregnancy.

## METHODS

This is a cross-sectional questionnaire study, done on the patients who came to the Department of Obstetrics and Gynecology, at Nepal Medical College Teaching Hospital, Attarkhel, Nepal

during the time of November- December 2020. The data was collected based on knowledge and behavioral aspects which was derived from a series of independent questionnaires. Those who were having any systemic illnesses like diabetes and HIV 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. Ethical clearance was obtained from the Nepal Medical College Institutional Review Committee (IRC).

The questionnaire consisted of questions which were divided into four parts;

The questions assessing the demographic characteristics

Questions on daily oral health practices

Knowledge about changes in oral health during pregnancy

Awareness about oral health and pregnancy outcomes.

Using the Cochran statistical formula ( $N = \frac{Z^2Pq}{d^2}$ ), the minimum sample size for the study was 164 where Z = 95% confidence interval, P (the prevalence of pregnant women with good knowledge) was set at 30%, q was equal to 1 – P, and d is a minimum acceptable degree of error which is set at 5%. Purposive sampling was done. Statistical analysis was done using SPSS version 20. So the minimum sample size for the study was 164.

## RESULTS

In our study, the maximum age group was in the range of 20-29 years (65.9%) and since Jorpati is a village, probably 44.3% of the participants were educated only till primary school and 56.9% of them were housewives (Table 1). There were also 16.8% who were educated till the bachelor's degree and 4.2% of them had completed a master's degree.

Education	Frequency	Percentage
No formal education	10	6%
Primary school	74	44.3%
High school certificate	48	28.7%
Bachelor's degree	28	16.8%
Post graduate	7	4.2%
<b>Age group</b>		
16-20 years	26	15%
20-29 years	110	65.9%
30-39 years	31	18.6%
<b>Occupation</b>		
Housewife	95	56.9%
Government job	6	3.6%
Private job	31	18.6%
Self employed	35	21%

Regarding the frequency of brushing, 75.4% confirmed that they brushed once a day. There were also 1.8% who revealed that they did not brush during pregnancy (Table 2). Surprisingly, 73.1% of pregnant women have never undergone oral prophylaxis (Table 2).

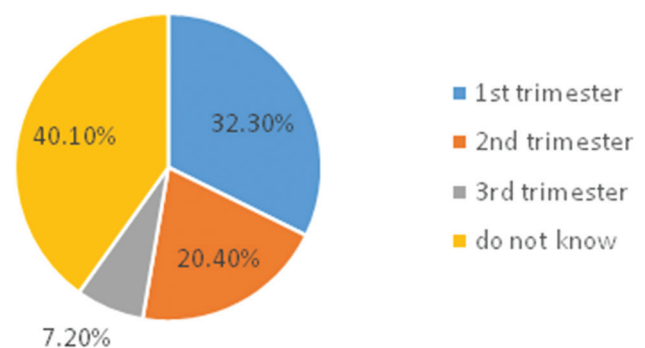
Brushing frequency	Frequency	Percentage
Once daily	126	75.4%
Twice daily	38	22.8%
No brushing	3	1.8%
<b>Last time when scaling was done in dental hospital /clinic</b>		
6 months back	6	3.6%
1 year back	4	2.4%
More than 1 year back	15	9%
Don't remember	20	12%
Never done	122	73.1%

Of the total participants, 55.7% said that they did not think gum disease can have adverse

pregnancy outcomes (Table 3). Also, 44.3% currently had bleeding from gingiva while brushing but only 35.9% had, at some point, consulted a dentist for bleeding gums (Table 3). Upon asking about any history of gingival enlargement during any of their pregnancies, 36.5% of them were affirmative and 46.1% said that they should wait for the delivery before they could do any dental treatment (Table 3).

Variable	Response	Frequency	Percentage
Do you think gum diseases have adverse pregnancy outcomes	Yes	74	44.3%
	No	93	55.7%
Do you have bleeding gums while brushing	Yes	74	44.3%
	No	93	55.7%
Have you consulted a dentist for bleeding gums	Yes	60	35.9%
	No	107	64.1%
Do you have gum enlargement/ history of gum enlargement in any of your pregnancies?	Yes	61	36.5%
	No	106	63.5%
Do you think you should wait for your delivery before you could visit a dentist for your treatment	Yes	77	46.1%
	No	90	53.9%

Regarding knowledge on safe trimester to undergo dental treatment during pregnancy, 40.1% did not know the answer and only 20.4% said the second trimester was the safest to undergo any dental procedure (Figure 1).



**Figure 1.** Safe trimester to perform dental treatment.

## DISCUSSION

In our study, the majority of the participants were educated till primary school (44.3%) and only 4.2% were educated till the master's level. In a similar study done in a rural population of Zambia, 60% of the participants had no education or educated only till the primary level.<sup>8</sup> Maximum participants in our study were in the age group 20-29 years (65.9%). In a similar study done with age ranging from 15 to 43 years, the median age was 24 years.<sup>8</sup> In another study also the majority of the participants were in the age group of 21-25 years.<sup>9</sup> One study showed that 36% of the participants were in the age group of 21-26 years which was the maximum number in any age group taken.<sup>10</sup> These similar data shows that most of the pregnant women were in their twenties.

Our study comprised of 56.9% housewives which were in concordance to another study which comprised of 93% housewives.<sup>10</sup>

Our study showed that 75.4% of the participants brushed once a day whereas 1.8% did not practice brushing in their pregnancy. This was similar to a study in which about 94% of the women were brushing their teeth at least once a day.<sup>11</sup> A similar study showed that around 18.6% did not brush their teeth during pregnancy although reasons were not clear.<sup>12</sup> One study showed that 8.0% did not practice brushing during pregnancy.<sup>9</sup>

It could be due to pregnancy complication like nausea or due to a myth that one should not brush during pregnancy as shown by a study in which 42.0% said they had difficulty in oral hygiene maintenance during pregnancy.<sup>9</sup> Another study showed that only 34.80% clean their teeth twice daily which is similar to our study in which 22.8% brushed twice daily.<sup>13</sup>

Regarding the answer to the last time when scaling was done in a dental hospital/clinic,

only 3.6% had undergone oral prophylaxis 6 months back and 73.1% who has never done oral prophylaxis in their life. Also, 64.1% has never visited a dentist for bleeding gums. Similar to our study, one questionnaire study showed that 100% of the lower middle class had never visited a dental clinic.<sup>14</sup> Another study showed that only 2.9% visited a dentist, that too more than 6 months back.<sup>10</sup> A study conducted in India showed that 93.9% of pregnant women did not go for routine dental check-ups.<sup>15</sup> Another study had similar results as only 13.7% visited a dentist during their pregnancy.<sup>16</sup> Similar study showed 15% of participants never visited the dentist.<sup>17</sup>

Nearly 72.81% of pregnant females had never attended the dentist.<sup>18</sup>

In our study, upon questioning whether they thought the gingival disease could have an adverse pregnancy outcome, 55.7% said it did not have any significant effect. One of the studies revealed that 99% of their participants felt there was no relation between periodontal diseases and preterm baby.<sup>14</sup> Another study revealed that 5.1% believed there might be a relationship between gum diseases and premature labor.<sup>19</sup> Also one study showed that 60% of pregnant women had low awareness regarding pregnancy and periodontal disease.<sup>10</sup> In another study, 95% were not aware that gum disease could cause preterm low birth weight babies.<sup>18</sup>

In our study, 44.3% experienced bleeding from gingiva although 64.1% of the participants never consulted a dentist. Similar study showed 32.7% experienced gum bleeding during pregnancy.<sup>20</sup>

In our study, 36.5% experienced gingival enlargement or they had a history of gingival enlargement during their previous pregnancies and 46.1% of them thought they had to wait till the delivery before they could visit a dentist for any treatment. A similar study showed that 23.5% of the participants had gingival enlargement.<sup>20</sup>

Our study also showed that 40.1% did not know the safe trimester to undergo dental treatment during pregnancy which was in concordance with a study where 93% were not aware of the safe period for undergoing dental treatment during pregnancy.<sup>18</sup>

Another study showed only 3% of pregnant women being aware of oral health having a correlation with adverse pregnancy outcomes which also showed that 96% of women had received no knowledge from the gynecologist regarding the impact of oral health on pregnancy outcomes.<sup>15</sup>

The American Dental Association (ADA) suggests that during the first and third trimester of pregnancy, elective dental care should be avoided, if possible.<sup>21</sup> California Dental Association Foundation states that 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.<sup>22</sup>

Physicians should have adequate knowledge about the association between pregnancy and oral health. In a study conducted, only 40% gynecologists recommended dental examination

during pregnancy although more than 70% of respondent obstetricians correctly knew of the effects of periodontitis on preterm birth and low birth weight babies.<sup>23</sup>

Also a community based study conducted in Sarlahi district of Nepal stated that the cost factor was the reason for not seeking dental care during pregnancy. In this study 40% of the participants had signs of clinical gingivitis and 88% had never received oral health care.<sup>24</sup>

## CONCLUSIONS

Our study shows that the knowledge of importance of oral health in pregnancy outcomes is not satisfactory among pregnant women visiting this tertiary care center. The provision of oral health education and necessary referral during antenatal care is essential for the benefit of pregnant women.

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