
The Relationship Between Oral Hygiene Maintenance And Pregnancy Gingivitis Among Pregnant Women At Lampasi Community Health Center, Payakumbuh, West Sumatra

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Abstract

Pregnancy causes hormonal changes that increase the susceptibility of gingival tissues to inflammation. Poor oral and dental hygiene can lead to plaque accumulation, thereby increasing the risk of pregnancy gingivitis. Therefore, maintaining good oral hygiene essential to preserve oral health during pregnancy. This study aimed to determine the relationship between oral and dental hygiene maintenance and pregnancy gingivitis among pregnant women at Lampasi Health Center, Payakumbuh, West Sumatra. This study employed an analytical design with a cross-sectional approach. The study population consisted of all pregnant women who visited Lampasi Health Center. A total of 39 respondents were selected based on the study criteria. Data were collected using a questionnaire on oral and dental hygiene maintenance and gingival examinations using the Gingival Index (GI). Data were analyzed using univariate and bivariate analyses with the Chi-Square test at a 95% confidence level. The results showed that 20 respondents (51.3%) had good oral and dental hygiene maintenance, while 19 respondents (48.7%) had poor oral hygiene maintenance. Good pregnancy gingivitis status was found in 26 respondents (66.7%), while moderate pregnancy gingivitis was observed in 13 respondents (33.3%). The Chi-Square test showed a p -value = 0.000 ($p < 0.05$), indicating a significant relationship between oral and dental hygiene maintenance and pregnancy gingivitis among pregnant women. It can be concluded that better oral and dental hygiene maintenance is associated with healthier gingival conditions. Pregnant women are recommended to maintain proper oral hygiene practices and undergo regular dental check-ups throughout pregnancy to prevent pregnancy gingivitis and improve overall oral health.

Keywords: Oral Hygiene Maintenance, Pregnancy Gingivitis, Pregnant Women

INTRODUCTION

According to the WHO, periodontal disease affects 19% of the global population. Periodontal disease remains prevalent in Indonesia, as documented in the 2023 Indonesian Health Survey (SKI) (Ministry of Health of the Republic of Indonesia, 2023). Gum bleeding is a characteristic symptom of gingivitis, a type of periodontal disease (Newman et al., 2002). Data from the 2023 SKI indicate that a significant portion of the Indonesian population—particularly in West Sumatra Province—suffers from the issue of easily bleeding gums (Ministry of Health of the Republic of Indonesia, 2023). Specifically regarding West Sumatra, data show that women in Padang City are more prone to this issue than men (Ministry of Health of the Republic of Indonesia, 2023).

Gingivitis is a common condition among pregnant women. Research by Erchick et al. (2019) found that 40% of pregnant women in Nepal suffered from gingivitis. A sample of 85 individuals was selected using the consecutive sampling method for a study conducted at Klungkung Regional General Hospital (RSUD) in Bali. Inclusion criteria comprised pregnant women who signed an informed consent form, were literate, and possessed good communication skills; conversely, those with a history of systemic disease were excluded. Assessments of gingival status at Klungkung RSUD revealed a high incidence of gingivitis (89.4%). Regarding the distribution of gingivitis by trimester, the first trimester showed the highest frequency of score 1, the second trimester showed the highest frequency of score 2, and the third trimester showed the highest frequency of score 3. An acidic oral environment develops when pregnant women with gingivitis experience nausea and vomiting during the first trimester. Prolonged acid exposure can trigger gingival irritation, which often does not manifest as obvious clinical symptoms. Gingivitis typically develops during the second trimester and worsens in the third (Pradnyanaputri et al., 2018).

A descriptive cross-sectional study was conducted in 2024 in Mekar Damai Village—located

within the service area of the Aikmual Community Health Center (Puskesmas) in Central Lombok Regency—to assess the risk of gingivitis among pregnant women. The study sample consisted of 30 pregnant women. The results showed that gingivitis was present in all 30 (100%) of the pregnant women studied. The most common level of inflammation severity was moderate (17 women; 56.67%), followed by severe (seven women; 23.33%) and mild (six women; 20%). Based on the study findings, all 30 pregnant women (100%) exhibited gingivitis; 17 pregnant women (56.67%) presented with mild inflammation, which was the most frequently observed severity level (Nataris & Santik, 2017).

Low birth weight (LBW) is a risk associated with pregnant women suffering from periodontal disease (Baliung et al., 2021). According to a study by Gesase et al. involving pregnant women giving birth in Northern Tanzania, those with periodontal disease faced a 3.4 times higher risk of preeclampsia compared to those without the condition (Gesase et al., 2018).

The gingival index is used to measure the severity of gingivitis. An index serves as a technique for assessing the condition and severity of a disease or state in an individual or a group. In clinical practice, this indicator is used to evaluate a patient's gingival condition and monitor changes in gingival health over time. The level of gum inflammation in individuals or subjects within a specific demographic group is assessed using the gingival index. The inflammation level of four gingival areas on each tooth—facial, mesial, distal, and lingual—was evaluated using the Löe and Silness method, which assigns scores ranging from 0 to 3. The definitions for the Gingival Index (GI) scores are as follows: Score 0: Normal gingiva with no bleeding, redness, or inflammation. Score 1: No bleeding, but mild edema, discoloration, and inflammation are present. Score 2: Moderate inflammation accompanied by evident bleeding, edema, and redness. Score 3: Tendency toward spontaneous bleeding, edema, ulceration, and a bright red appearance.

The Lampasi Community Health Center (Puskesmas) is located in Payakumbuh City, where many pregnant patients present with oral and gum issues, including gingivitis. Pregnant women visiting the center frequently report—particularly during the first trimester—a reluctance to brush their teeth due to nausea or vomiting triggered by the act of brushing. Some women suffer from gingivitis throughout their pregnancy due to prolonged nausea and vomiting. This impacts the health of both the mother and the fetus; while a healthy mother typically carries a healthy baby, a failure to maintain proper oral hygiene can compromise the fetus's health. Ideally, pregnancy should be a time for consuming healthy foods and maintaining good oral hygiene.

A preliminary study conducted at the Lampasi Community Health Center between January and December 2025 involved 1,705 visits by pregnant women (representing a target population of 293 individuals). During this period, researchers assessed the gingivitis index of 10 pregnant women: three in the first trimester, four in the second, and three in the third. Based on the Gingival Index (GI), five women (50%) fell into the "poor" category (average score of 2.2), indicating severe inflammation; three (30%) were in the "moderate" category (average score of 1.6), showing distinct inflammation and bleeding upon probing; and two (20%) were in the "good" category (average score of 0.8), indicating mild inflammation. The primary factors contributing to gingivitis in these women appear to be the habit of neglecting to brush their teeth before bed, consuming foods detrimental to oral health, and failing to visit a dentist or dental health facility for check-ups. Given the high incidence of gingivitis among pregnant women observed in that preliminary study, this condition warrants attention, as pregnancy gingivitis can adversely affect the health of both the mother and the fetus if not properly managed. Hormonal changes during pregnancy, combined with inadequate oral hygiene, can exacerbate gingival inflammation.

RESEARCH METHODS

This study employs a quantitative analytical approach using a cross-sectional design, wherein the independent and dependent variables are measured simultaneously. The study population consists of 135 pregnant women at the Lampasi Community Health Center (Puskesmas) in Payakumbuh. The

sample was selected using the accidental sampling technique—specifically, by recruiting 39 pregnant women who happened to visit the Maternal and Child Health (KIA) unit at the Lampasi Community Health Center. The study was conducted at the Lampasi Community Health Center in Payakumbuh City in June 2026.

Information was obtained directly from records regarding pregnancy gingivitis and oral hygiene status among pregnant women at the Lampasi Community Health Center. Research instruments served as tools for data collection; the instruments used included a questionnaire, the Gingival Index (GI), and a dental probe. The collected data underwent processing stages—editing, coding, transferring, and tabulating—and were subsequently analyzed descriptively by calculating frequencies and percentages, with the results presented in both tabular and narrative formats.

RESULTS AND DISCUSSION

General Data

Respondent Characteristics by Age

Table 1. Frequency Distribution of Pregnant Women Respondents by Age at Lampasi Community Health Center, Payakumbuh, West Sumatra, 2026

No	Age (Years)	Frequency	Percentage
1	21–28	22	56,4
2	29–35	17	43,6
Total		39	100

Table 1 shows that the majority of respondents fell into the 21–28 age group (22 individuals, or 56.4%), while 17 individuals (43.6%) belonged to the 29–35 age group.

Respondent Characteristics by Occupation

Table 2. Frequency Distribution of Pregnant Women Respondents by Occupation at Lampasi Community Health Center, Payakumbuh, West Sumatra, 2026

No	Occupation	Frequency	Percentage
1	Homemaker	10	25,6
2	Employee	14	35,9
3	Self-employed / Entrepreneur	15	38,5
Total		39	100

Table 2 shows that the majority of respondents fall into the self-employed category (traders, farmers, and entrepreneurs), comprising 15 individuals (38.5%), followed by the employee category (teachers and contract staff) with 14 individuals (35.9%), while 10 individuals (25.6%) are housewives.

Respondent Characteristics Based on Pregnancy Order

Table 3. Frequency Distribution of Respondents Based on Pregnancy Order at Lampasi Community Health Center, Payakumbuh, West Sumatra, 2026

No	Pregnancy Number	Frequency	Percentage
1	1	9	23,1
2	2	16	41,0
3	3	7	17,9
4	≥4	7	17,9
Total		39	100

Table 3 shows that the majority of respondents were mothers in their second pregnancy (16 individuals, or 41.0%), while those in their third pregnancy and those in their fourth or subsequent pregnancy each numbered 7 (17.9%), and those in their first pregnancy numbered 9 (23.1%).

Respondent Characteristics Based on Pregnancy Trimester

Table 4. Frequency Distribution of Respondents Based on Pregnancy Trimester at Lampasi Community Health Center, Payakumbuh, West Sumatra, 2026

No	Trimester	Frequency	Percentage
1	I	10	25,6
2	II	16	41,0
3	III	13	33,3
Total		39	100

Table 4 shows that the majority of respondents were in the second trimester (16 individuals, or 41.0%), while the smallest number were in the first trimester (10 individuals, or 25.6%).

Specific Data

Distribution of Oral Hygiene Maintenance

Table 5. Frequency Distribution of Oral Hygiene Maintenance among Pregnant Women at Lampasi Community Health Center, Payakumbuh, West Sumatra, 2026

No	Maintaining Dental and Oral Hygiene	Frequency	Percentage
1	Good	12	30.8
2	Not Good	27	69.2
Total		39	100

Table 5 shows that the majority of pregnant women at the Lampasi Payakumbuh Community Health Center in West Sumatra (2026) fell into the "poor" category regarding oral hygiene maintenance—specifically 27 respondents (69.2%)—while 12 respondents (30.8%) fell into the "good" category.

Distribution of Pregnancy Gingivitis

Table 6. Frequency Distribution of Pregnancy Gingivitis among Pregnant Women at the Lampasi Community Health Center, Payakumbuh, West Sumatra, in 2026

No	Pregnancy Gingivitis	Frequency	Percentage
1	Light	21	53.8
2	Moderate	16	41.0
3	Severe	2	5.1
Total		39	100

Table 6 shows that the majority of pregnant women experienced mild pregnancy gingivitis (21 respondents, 53.8%), followed by moderate (16 respondents, 41.0%) and severe (2 respondents, 5.1%) categories.

Bivariate Analysis

The frequency distribution of respondents regarding the relationship between oral hygiene maintenance and pregnancy gingivitis is presented in Table 7 below.

Table 7. Relationship between Oral Hygiene Maintenance and Pregnancy Gingivitis among Pregnant Women at Lampasi Community Health Center, Payakumbuh, West Sumatra, in 2026

No	Pregnancy Gingivitis	Maintaining Dental and Oral Hygiene								Sign.
		Light		Moderate		Severe		F	%	
		F	%	F	%	F	%			
1	Good	12	30,8	0	0	0	0,0	12	30,8	0.001 <0.05
2	Not Good	9	23,1	16	41	2	5,1	27	69,2	
Total		21	53,8	16	41	2	5,1	39	100	

Based on Table 7, it is evident that among the 12 respondents (30.8%) with good oral hygiene maintenance, all experienced mild pregnancy gingivitis. Meanwhile, among the 27 respondents (69.2%) with poor oral hygiene maintenance, 9 respondents (23.1%) experienced mild gingivitis, 16 respondents (41.0%) experienced moderate gingivitis, and 2 respondents (5.1%) experienced severe gingivitis. Statistical test results showed a significance value of $p = 0.001$ ($p < 0.05$); thus, it can be concluded that there is a significant relationship between oral hygiene maintenance and pregnancy gingivitis among pregnant women at the Lampasi Community Health Center (Puskesmas) in Payakumbuh, West Sumatra, in 2026.

Discussion

This study aims to determine the relationship between oral hygiene practices and the incidence of pregnancy gingivitis among pregnant women at the Lampasi Community Health Center in Payakumbuh, West Sumatra, in 2026. A cross-sectional study design was employed, involving 39 pregnant women who met the study criteria. Data on oral hygiene practices were collected via questionnaires, while the presence of pregnancy gingivitis was assessed through clinical examinations using the Gingival Index; the data were subsequently analyzed using the Chi-Square test to examine the relationship between the two variables.

The results indicate that the majority of respondents were aged 21–28 years (56.4%), self-employed (38.5%), in their second pregnancy (41.0%), and in the second trimester of pregnancy (41.0%). These characteristics suggest that most respondents were within a healthy reproductive age range and engaged in relatively high levels of occupational activity. Furthermore, the fact that most respondents were in the second trimester—a period when pregnancy-related hormonal changes intensify and can affect periodontal tissue—highlights the need for pregnant women to pay closer attention to oral hygiene. Research by Wulandari et al. (2022) indicates that pregnant women in the second trimester face a higher risk of periodontal changes compared to the first trimester; this is due to rising levels of estrogen and progesterone, which influence vascularization and heighten the gingival tissue's inflammatory response to plaque. The second trimester is a period when pregnancy-related physiological changes are in full effect, rendering gingival tissue more sensitive to local irritants. If these changes are not accompanied by proper oral hygiene practices, the risk of developing pregnancy gingivitis increases (Wulandari et al., 2022).

Frequency distribution results show that the majority of pregnant women practiced poor oral hygiene (69.2%). Additionally, most respondents presented with mild pregnancy gingivitis (53.8%), followed by moderate (41.0%) and severe (5.1%) cases. These findings indicate that a significant number of pregnant women have yet to adopt optimal oral hygiene practices. This condition allows for plaque accumulation, which triggers gingival inflammation. During pregnancy, elevated levels of estrogen and progesterone also heighten the gingival tissue's response to plaque, making pregnant women more susceptible to pregnancy gingivitis even when the amount of plaque is not excessive.

Bivariate analysis results indicate that all respondents with good oral hygiene practices experienced mild pregnancy gingivitis (30.8%). Conversely, among respondents with poor oral hygiene, the majority experienced moderate pregnancy gingivitis (41.0%), while others experienced severe cases (5.1%). The Chi-Square test yielded a p -value of 0.001 ($p < 0.05$), demonstrating a

significant association between oral hygiene practices and pregnancy gingivitis in pregnant women. The researchers hypothesize that pregnant women who maintain good oral hygiene tend to have less plaque accumulation, resulting in milder gingival inflammation. In contrast, poor oral hygiene leads to the accumulation of plaque and calculus, which serve as breeding grounds for bacteria that cause gingival inflammation. This condition is exacerbated by hormonal changes during pregnancy that increase blood vessel permeability and the inflammatory response of gingival tissue, thereby making pregnancy gingivitis more likely to occur.

The researchers assume this association exists because pregnant women who habitually maintain good oral hygiene are able to reduce plaque accumulation on tooth surfaces. Plaque is the primary etiological factor in the development of gingivitis. During pregnancy, elevated levels of estrogen and progesterone increase the permeability of gingival blood vessels, making gingival tissue more susceptible to inflammation in the presence of plaque. Conversely, if plaque is controlled through proper tooth-brushing techniques, the use of oral hygiene aids, and regular dental check-ups, the risk of pregnancy gingivitis can be minimized, even amidst the hormonal changes associated with pregnancy.

Overall, these results indicate that maintaining gum health during pregnancy relies heavily on good oral hygiene. To prevent pregnancy-associated gingivitis, it is essential to enhance education regarding oral hygiene and encourage routine dental check-ups.

CONCLUSION

Based on the study regarding the relationship between oral hygiene maintenance and pregnancy gingivitis among pregnant women at the Lampasi Community Health Center in Payakumbuh, West Sumatra, it can be concluded that there is a significant relationship between oral hygiene maintenance and pregnancy gingivitis in this population. The Chi-Square test results showed a p-value of 0.001 ($p < 0.05$), indicating that better oral hygiene maintenance is associated with a milder severity of pregnancy gingivitis experienced by the pregnant women.

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