

# Awareness, Attitude, and Knowledge Regarding Periodontal Disease Among Pregnant Women in Kunduz, Afghanistan

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**Background:** Pregnancy can make women more vulnerable to oral health problems due to hormonal fluctuations. Periodontal disease, a chronic inflammatory condition that affects the gums and supporting tissues, has been linked to serious complications such as preterm birth and low birth weight. Despite the established connection between oral and general health, especially during pregnancy, many women, particularly in developing countries like Afghanistan, are not adequately informed about these risks.

**Objective:** The aim of this study was to explore the awareness, knowledge, and attitudes regarding periodontal disease among pregnant women in Kunduz, Afghanistan.

**Methods:** A descriptive cross-sectional study was carried out among 200 pregnant women attending antenatal clinics in Kunduz. Participants completed a structured questionnaire designed to assess their demographic characteristics and their understanding and perceptions of periodontal disease. The data were analyzed using descriptive statistics.

**Results:** Among the respondents, 63.0% were aged 22–34 years, and 39.0% were in their third trimester. Nearly half (49.5%) reported poor general health. Educational levels were low, with 64.0% being illiterate. Awareness of periodontal disease and its impact on pregnancy outcomes was generally poor, with only 40.5% agreeing that pregnancy increases gingival inflammation risk and 45.0% recognizing a link between dental health and pregnancy. Many participants held misconceptions, such as avoiding dental care during pregnancy due to safety concerns.

**Conclusion:** There is a critical need for targeted oral health education during pregnancy in Kunduz. Incorporating oral health education into antenatal care services may help bridge the current knowledge gap and reduce the risk of preventable complications.

**Keywords:** periodontal disease, pregnancy, oral hygiene, maternal health, awareness, Afghanistan

## Introduction

Oral health is an essential and integral part of general health.<sup>1</sup> It has been aptly described that the oral cavity functions as a “window” through which external microorganisms interact with the host, this concept highlights the interconnectedness of oral health with overall systemic health.<sup>2</sup> In recent years, substantial evidence has shown that systemic diseases can significantly impact oral health, further substantiating the critical role oral health plays in an individual’s overall well-being.<sup>3</sup> Among the many systemic conditions that affect oral health, periodontal disease has been strongly linked to cardiovascular diseases, diabetes, and pregnancy-related complications such as preterm birth and low birth weight.<sup>4</sup>

Periodontal disease, also known as gum disease, is a chronic inflammatory condition that affects the supporting structures of the teeth, including the gums, periodontal ligaments, and alveolar bone.<sup>5</sup> It is caused by bacterial infections that lead to plaque and tartar buildup on the teeth, resulting in gum inflammation, bleeding, and, if left untreated,

destruction of the tissues that support the teeth.<sup>6</sup> The severity of periodontal disease can range from gingivitis, the mildest form, to periodontitis, which can lead to tooth loss and other systemic health issues.<sup>5,7</sup>

Pregnancy represents a particularly vulnerable period for periodontal disease due to hormonal changes, particularly increases in estrogen and progesterone, which can exacerbate gum sensitivity and inflammation.<sup>8,9</sup> This condition is of particular concern during pregnancy because it has been associated with adverse outcomes such as preterm birth, low birth weight, and preeclampsia.<sup>8,10</sup> Maintaining good oral hygiene during pregnancy may significantly reduce these risks.<sup>10</sup>

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Despite the known risks, awareness and preventive care regarding periodontal disease remain low, particularly in resource-poor settings<sup>2,11</sup> like Kunduz, Afghanistan. Without proper knowledge or access to dental care, many pregnant women fail to recognize the importance of oral health. Factors such as education, cultural influences, and healthcare access play a significant role in shaping their attitudes and knowledge about oral hygiene.

In Kunduz, a province in northern Afghanistan, healthcare access is limited, and public health awareness is low due to decades of conflict, poverty, and limited educational opportunities for women. Understanding the current knowledge, attitude, and awareness of pregnant women regarding periodontal disease is crucial for developing community-specific educational strategies.

This study is the first in Afghanistan to examine awareness, attitudes, and knowledge of periodontal disease among pregnant women in Kunduz, Afghanistan. By exploring factors such as age, education, and general health, the study aims to identify knowledge gaps and inform public health initiatives to improve oral health practices. Ultimately, enhancing awareness and preventive care can reduce the risks associated with periodontal disease, improving maternal and fetal health outcomes.

## Materials and Methods

### Study Design

This descriptive cross-sectional study was conducted from April 2024 to May 2025 at antenatal clinics of Kunduz Regional Hospital and Ebadi Kunduz Curative Hospital, key healthcare facilities serving northeastern Afghanistan. The study targeted pregnant women to assess their awareness, attitudes, and knowledge of periodontal disease and its implications.

Participants were 200 pregnant women aged 17-44 years attending antenatal care during the study period. Inclusion criteria required participants to be pregnant in any trimester and willing to provide informed consent. Exclusion criteria included non-pregnant women, those declining consent, or those with severe cognitive or mental impairments hindering survey participation.

Ethical approval was obtained from the Institutional Review Board of Kunduz University. Informed consent was secured from all participants, with confidentiality ensured through anonymized data collection. This study complies with the Declaration of Helsinki. Informed consent was secured from all participants, with confidentiality ensured through anonymized data collection. For participants under 18 years, parental or legal guardian informed consent was required in addition to assent from the participant. Participants could withdraw at any time without consequences. Participants could withdraw at any time without consequences.

### Sample Size and Sampling Technique

A convenience sampling method was used to recruit participants for this study. The sample consisted of 200 pregnant women attending antenatal care clinics in Kunduz, selected to represent the pregnant women population in the region. The sample size was determined based on feasibility, with the aim of obtaining a diverse representation of participants in terms of age, education, and health status. The sample size was determined based on feasibility, aiming for a diverse representation of participants in terms of age, education, and health status.

## Data Collection

Data were collected via face-to-face interviews using a structured questionnaire administered in Dari or Pashto, the participants' native languages. The questionnaire, adapted from validated instruments<sup>2</sup> contained 20 closed-ended questions. The questionnaire included questions covering three key aspects: participants' knowledge about periodontal disease, its risks, and its association with pregnancy complications; their attitudes toward the importance of oral health during pregnancy; and their understanding of the causes, symptoms, and preventive measures related to periodontal disease. Questions regarding causes, symptoms, and preventive measures were part of the adapted tool. In addition to the core oral health-related questions, demographic information such as age, education level, self-reported general health, and trimester of pregnancy was also collected. It was translated and back-translated for cultural and linguistic accuracy in Dari/Pashto.

The primary measures included awareness, attitude, and knowledge related to periodontal disease. Awareness was assessed by determining whether participants knew about periodontal disease and its potential impacts on pregnancy. Attitude toward oral health was evaluated based on participants' perceptions of the importance of maintaining good oral health during pregnancy. Knowledge was assessed through questions on the causes, symptoms, and risks associated with periodontal disease, as well as preventive measures. Socio-demographic characteristics were considered as exposure variables. Age was categorized into three groups: 17–21 years, 22–34 years, and 35–44 years. Participants were also classified by trimester of pregnancy: first, second, or third. General health status was self-reported and classified as either healthy or ill. Education level was recorded as illiterate, primary education, secondary education, or high school and above. Body Mass Index (BMI) was grouped into three categories: less than 21, 21–24.9, and 25 or higher, to explore potential associations with systemic inflammation that could influence periodontal susceptibility.

## Statistical Analysis

All statistical analyses were performed using SPSS version 29.0 (IBM Corp., Armonk, NY, USA) for Windows (Microsoft Corp., Redmond, WA, USA). Descriptive statistics (frequencies, percentages, means, standard deviations) summarized participant characteristics and outcomes. Associations between demographic variables and awareness/knowledge were explored using chi-square tests, with a  $p$ -value  $< 0.05$  indicating significance.

## Results

The study included 200 pregnant women, with 63.0% aged 22–34 years, 22.0% aged 17–21, and 15.0% aged 35–44. In terms of pregnancy stage, 39% were in their third trimester, 36.5% in the second, and 24.5% in the first trimester. When asked about their general health, just over half (50.5%) considered themselves healthy, while 49.5% said they felt unwell during pregnancy. Educational levels were generally low among participants, 64% were illiterate, and only 6.5% had completed high school or higher. Regarding body mass index (BMI), more than half (51.5%) had a BMI between 21 and 25, while 39% had a BMI of 25 or higher (Table 1).

Chi-square tests showed no significant associations between demographic variables (age, education, BMI) and awareness/knowledge levels (all  $p > 0.05$ ).

The majority of women (60.0–70.0% disagreeing) showed limited awareness about the connection between periodontal disease and pregnancy outcomes. Most participants disagreed with statements suggesting that periodontal disease could lead to high blood pressure during pregnancy, premature birth, or low birth weight. Similarly, many (55.0–65.0%) disagreed that gingivitis or periodontitis affects pregnancy outcomes. However, awareness was higher regarding the effect of pregnancy on gum health, with more than half (52.5%) agreeing that pregnancy increases the risk of gingival inflammation, and nearly half (45.0%) recognizing a connection between dental and gingival health and pregnancy (Figure 1).

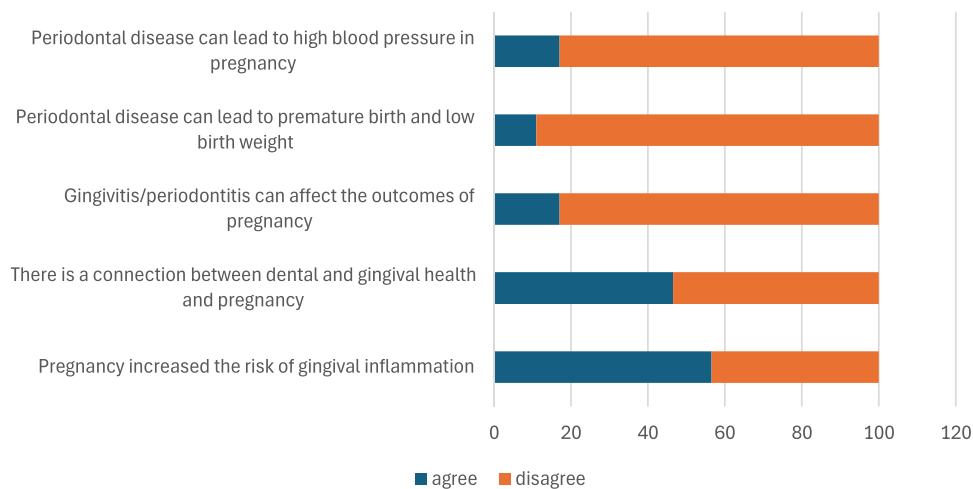
When it came to where they got their information, gynecologists were the most common source (42%), followed by dentists (27.5%) and family physicians (27%). A small number of women mentioned the internet (5%) or printed materials such as books or brochures (3%) (Figure 2).

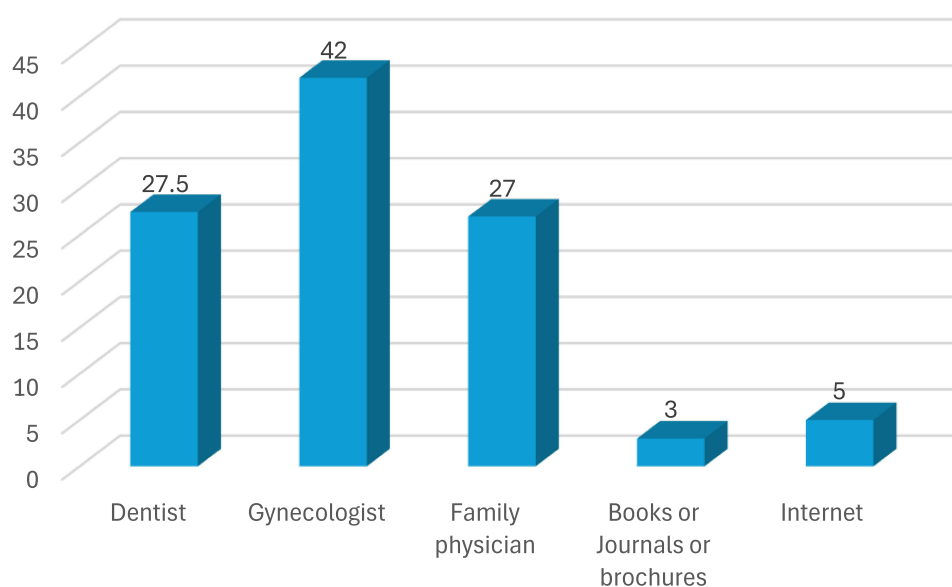
**Table 1** Demographic and Health Characteristics of Pregnant Women Participants (n=200)

Characteristics	Distribution of Responses n (%)
Age	
17–21	44 (22.0)
22–34	126 (63.0)
35–44	30 (15.0)
Trimester	
First	49 (24.5)
Second	73 (36.5)
Third	78 (39.0)
Self-reported general health	
Ill	99 (49.5)
Healthy	101 (50.5)
Education	
Illiterate	128 (64.0)
Primary	49 (24.5)
Secondary	10 (5.0)
High school and more	13 (6.5)
BMI	
<21	19 (9.5)
21–<25	103 (51.5)
≥25	78 (39.0)

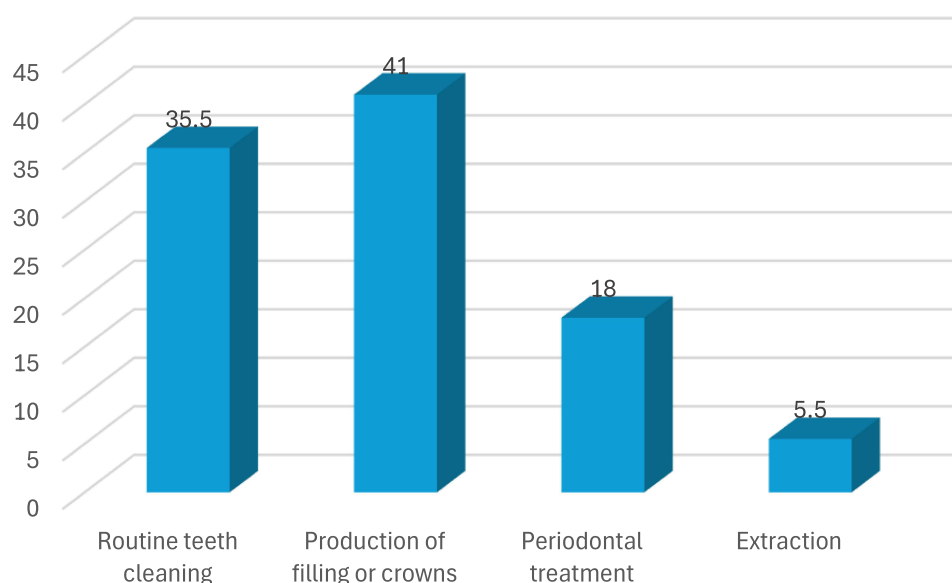
**Abbreviations:** BMI, body mass index; N, number of participants; %, percentage.

Opinions about dental treatment during pregnancy varied. While 41% felt that procedures like fillings or crowns were safe, only 35.5% believed routine teeth cleaning was safe. Even fewer thought periodontal treatment (18%) or tooth extractions (5.5%) were safe during pregnancy (Figure 3).

**Figure 1** Awareness of Periodontal Disease Risks Among Pregnant Women.



**Figure 2** Source of information about relationships between oral health and pregnancy.



**Figure 3** Attitudes about the safety of treatment during pregnancy.

## Discussion

This study represents the first investigation into the awareness, attitudes, and knowledge of periodontal disease among pregnant women in Kunduz, Afghanistan. The findings highlight a significant gap in understanding the importance of oral health during pregnancy, which is particularly concerning given the established link between periodontal disease and adverse pregnancy outcomes, such as preterm birth, low birth weight, and preeclampsia.<sup>12,13</sup> This lack of awareness may exacerbate health disparities in underserved regions like Kunduz, where access to dental care and health education is limited.

A notable proportion of participants (40.5–45.0%) demonstrated awareness of the connection between oral health and pregnancy, such as recognizing that pregnancy increases the risk of gingival inflammation. However, awareness of specific complications, such as the potential for periodontal disease to contribute to high blood pressure, preterm birth, or

low birth weight, was limited, with many participants (55.0–70.0%) disagreeing with statements about these risks. Prior studies provide context for these mechanisms, indicating that systemic inflammation and the hematogenous spread of oral pathogens may impair placental function and fetal development.<sup>14,15</sup> These observations are consistent with studies in similar low-resource settings, such as Nepal (where only 30–40% awareness was reported)<sup>11</sup> and Saudi Arabia (45–50% recognizing risks),<sup>16</sup> though differences may stem from varying education levels and healthcare access. In contrast, higher awareness (60–70%) has been noted in India,<sup>2</sup> potentially due to more integrated antenatal programs.

Pregnancy-related hormonal changes are known to increase susceptibility to gingival inflammation and periodontal disease.<sup>2,16,17</sup> However, many pregnant women remain unaware of this heightened risk and its potential implications for pregnancy outcomes.<sup>2</sup> Similarly, in our study, a considerable number of women (47.5%) lacked knowledge about these risks. This limited awareness may contribute to inadequate oral hygiene practices, increasing the likelihood of complications such as preterm birth and low birth weight. Prior epidemiological reviews offer background, showing associations between maternal periodontal disease and adverse outcomes,<sup>1–3</sup> though our study focuses on awareness rather than direct measurement.

Attitudes toward dental treatment during pregnancy were mixed. While 35.5% believed routine dental cleaning was safe, fewer participants thought restorative treatments, periodontal therapy, or extractions could be safely performed during pregnancy. This hesitancy likely stems from misconceptions and fear of harming the fetus, reflecting the need for better patient education on the safety and necessity of dental care during pregnancy. This study's findings highlight the importance of incorporating oral health education and screening into existing maternal healthcare programs in Afghanistan, particularly in underserved regions like Kunduz. Health authorities and policymakers should prioritize training healthcare providers to deliver oral health counseling and improve access to preventive dental services for pregnant women.

This study has several limitations. First, its cross-sectional design limits causal inference. Second, the use of convenience sampling may restrict the generalizability of findings, as recruitment was limited to two clinics. Third, the reliance on self-reported data may introduce recall or self-reporting bias. Finally, statistical analyses were limited to descriptive and basic associations; future studies could incorporate multivariate analyses for added depth. Despite these limitations, this study provides valuable baseline data for future oral health interventions targeting pregnant women in Afghanistan.

## Conclusion

Addressing the gaps in awareness, attitude, and knowledge regarding periodontal disease among pregnant women in Kunduz is critical for enhancing maternal and fetal health, particularly given the high illiteracy rate (64.0%) linked to low awareness levels. Culturally sensitive educational programs, integrated within antenatal care, can empower women to maintain better oral hygiene and reduce the risk of adverse pregnancy complications related to periodontal disease.

## Data Sharing Statement

Data supporting the study's findings can be obtained upon request from the corresponding author.

## Disclosure

The authors have no potential conflicts of interest to report.

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