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Original article

Assessment of Self-Reported Oral Health Status and Oral Hygiene Habits Among Pregnant Women in Libya

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Abstract
Oral health during pregnancy is critical for maternal and fetal well-being. Limited data exist regarding pregnant women's oral health knowledge, attitudes, and practices in Libya. This study aimed to evaluate self-reported oral health status and hygiene habits among pregnant women. The findings may contribute to enhancing maternal oral health programs and guiding future policy interventions. A cross-sectional descriptive study was conducted among 159 pregnant women attending antenatal care at Gharyan Teaching Hospital and affiliated clinics, Libya, from July to November 2025. Participants completed a structured, self-administered questionnaire assessing sociodemographic characteristics, oral health knowledge, attitudes, and practices. The majority of participants were aged 21–30 years (54.1%) and had university-level education (61.0%). While most women brushed their teeth (95.0%), only 36.5% reported brushing twice daily, and 20.8% visited the dentist regularly. Knowledge regarding the relationship between oral health and overall health was high (86.2%), but awareness of preventive measures, such as fluoride toothpaste (37.7%) and alternative cleaning methods (39.0%), was limited. Overall, 77.4% of participants demonstrated adequate oral health knowledge (score ≥7). Higher education level and visiting a dentist during pregnancy were significantly associated with adequate knowledge ($p = 0.024$ and $p = 0.005$, respectively). Age, parity, trimester, and perceived oral health status were not significantly associated with knowledge. Pregnant women in this study demonstrated good general awareness of oral health but suboptimal preventive practices and limited knowledge of specific oral hygiene measures. Targeted oral health education and accessible dental services during pregnancy are recommended to improve maternal oral health outcomes in Libya.
Keywords. *Pregnancy, Oral health, Oral hygiene practices, Knowledge, Libya.*

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Introduction

Pregnancy is a critical period during which women experience multiple physiological and hormonal changes that can significantly affect their oral health (1). Alterations in salivary flow, dietary patterns, and immune response may increase the risk of gingivitis, periodontal disease, and dental caries (2, 3). Maintaining proper oral hygiene practices is therefore essential to prevent oral complications that may negatively impact both maternal and fetal health (2). Dental caries is the second most important disease of the oral cavity in pregnancy. Active dental caries, if left untreated, can lead to both local and systemic complications. The presence of dental caries during pregnancy, especially after birth, represents an increased risk of early childhood caries development. Cariogenic bacteria can be transmitted through the saliva to the oral cavity of an infant (4). Approximately 40 % of pregnant women experience periodontal disease. Due to the prevalence and health consequences associated with oral health during this sensitive period (5). Studies have not yet shown that treatment of periodontal disease during pregnancy will improve outcomes; however, they do show that dental treatment of periodontal disease during pregnancy is safe. Women should be seen by a dentist early in pregnancy to prevent or correct any oral health conditions (4,5).

During pregnancy, gingival alterations occur as the gums become highly vascularized, hyperplastic, and edematous; however, only 63% of women visit a dentist during this time (6). Bleeding gums, mediated by elevated estrogen, are often associated with pregnancy. Nonetheless, bleeding gums are often a sign of periodontal disease and should not be ignored. During pregnancy, it is estimated that 40% of women have some form of periodontal disease (7). Self-reported assessments of oral health and hygiene behaviors are widely used in public health research because they provide valuable insight into individual perceptions, habits, and barriers to care (8). Despite the global emphasis on maternal oral health, limited data are available regarding the oral hygiene practices and awareness levels among pregnant women in Libya, as most regional studies have focused on neighboring countries. Understanding these behaviors is crucial for designing effective preventive strategies, improving antenatal dental services (9,10). Therefore, this study aims to evaluate the self-reported oral health status and oral hygiene habits among pregnant women in Libya. The findings may contribute to enhancing maternal oral health programs and guiding future policy interventions.

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Methods

Study design

This cross-sectional descriptive study was conducted among pregnant women attending antenatal care at Gharyan Teaching Hospital and its affiliated outpatient clinics in Gharyan, Libya.

Data collection

Data collection took place over five months, from July to November 2025. The study included pregnant women aged 18–42 years, and a total sample of 159 participants was obtained using a convenience sampling technique. A structured, self-administered questionnaire was used for data collection. Prior to the main study, a pilot study was conducted with 20 pregnant women to assess clarity, cultural appropriateness, and reliability of the instrument, yielding a Cronbach's alpha of 0.87, indicating high internal consistency. The questionnaire was developed based on previously published studies related to oral health and oral hygiene behaviors among pregnant women. It was initially prepared in English and then translated into the local Arabic dialect to ensure comprehension and linguistic accuracy. The final version of the questionnaire consisted of two main sections. The first section focused on sociodemographic characteristics, including age, education level, number of pregnancies, and current month of pregnancy, in addition to questions regarding perceived oral health status and dental visits during pregnancy. The second section included 14 study-specific questions addressing self-reported oral health conditions and oral hygiene practices. These questions covered toothbrushing habits, use of fluoride toothpaste, flossing and mouthwash use, presence of oral symptoms such as pain or bleeding gums, sugar consumption patterns, barriers to accessing dental care during pregnancy, and attitudes toward dental treatment while pregnant.

Ethical approval

Ethical approval was obtained from the local ethics committee in Gharyan, and written informed consent was secured from all participants. Confidentiality and anonymity were strictly maintained.

Data analysis

After data collection, responses were coded and analyzed using SPSS software (version 20). Descriptive statistics—including frequencies, percentages, means, and standard deviations—were used to summarize the data. Chi-square tests were applied to examine associations between sociodemographic variables and oral hygiene practices, with statistical significance set at $p < 0.05$.

Results

A total of 159 pregnant women participated in the study. More than half of the participants were aged 21–30 years (54.1%), and the majority had university-level education (61.0%). Over half of the women were in their third or subsequent pregnancy (56.0%), and 39.0% were in the third trimester. Despite this, only 41.5% reported visiting a dentist during pregnancy (Table 1).

Table 1. Sociodemographic and Pregnancy-Related Characteristics of the Study Participants (N = 159)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	< 20	13	8.2
	21–30	86	54.1
	31–40	60	37.7
Educational Level	Uneducated / Illiterate	3	1.9
	Preparatory	12	7.5
	High School	47	29.6
	University	97	61.0
Number of Pregnancies	First	34	21.4
	Second	36	22.6
	Third or more	89	56.0
Pregnancy Trimester	First trimester	51	32.1
	Second trimester	46	28.9
	Third trimester	62	39.0
Dental Visit During Pregnancy	No	91	57.2
	Yes	66	41.5
	Unspecified	2	1.3

The majority of participants (83.0%) were aware that candy consumption causes tooth decay. Although most women brushed their teeth (95.0%), only 36.5% reported brushing twice daily and just 20.8% visited the

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dentist regularly. Knowledge regarding the association between oral health and general health was high (86.2%); however, awareness of fluoride toothpaste benefits (37.7%) and other cleaning methods (39.0%) was limited (Figure 1).

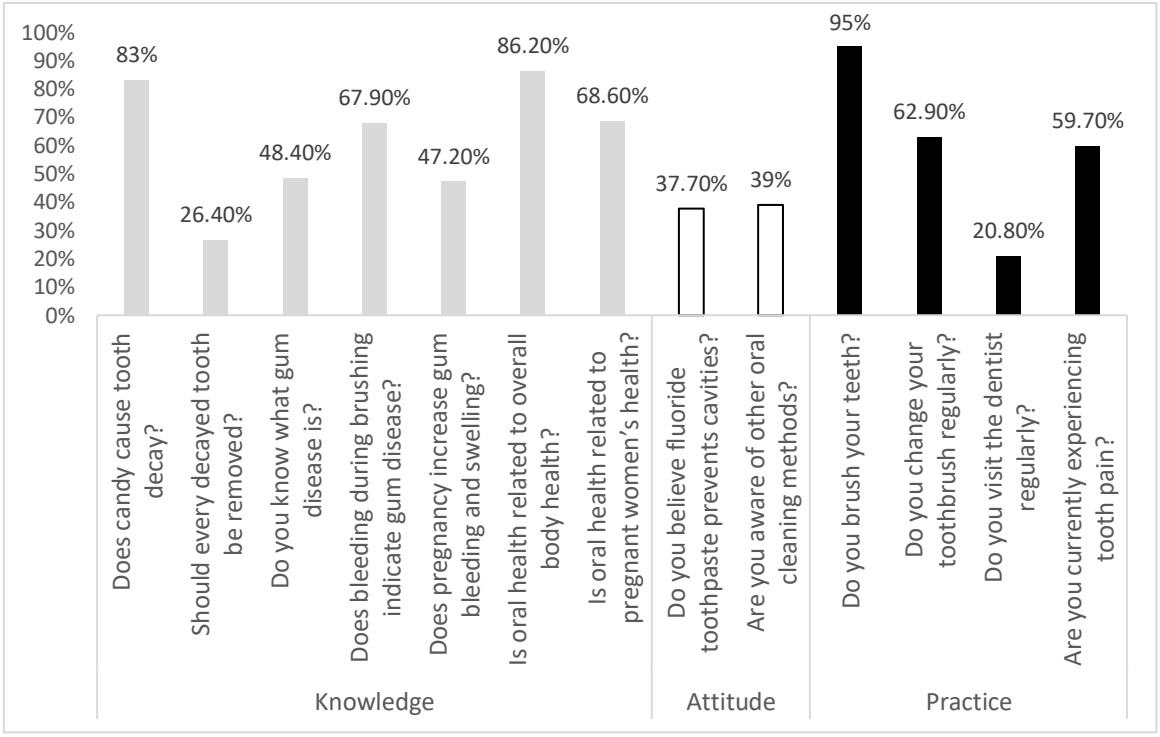

Figure 1. Knowledge, Attitude, and Practice (KAP) Regarding Oral Health Among Pregnant Women (N = 159)

Out of 159 pregnant women, 123 (77.4%) had adequate oral health knowledge (Score ≥ 7) (Figure 2). Education level and visiting the dentist during pregnancy were significantly associated with oral health knowledge ($p = 0.024$ and $p = 0.005$, respectively). Age, number of pregnancies, trimester, and expected oral health status were not significantly associated with knowledge ($p > 0.05$). Women with higher education and those who visited the dentist were more likely to have adequate knowledge (Table 2).

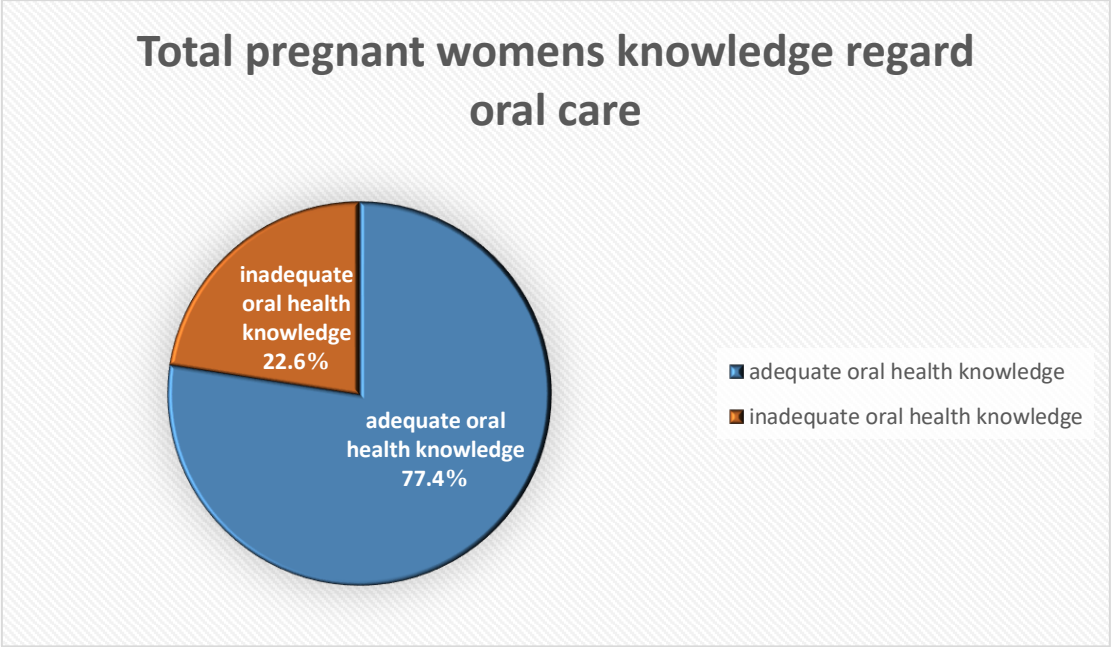

Figure 2. Total pregnant women's regard for oral health knowledge

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Table 2. Association Between Sociodemographic and Obstetric Factors and Oral Health Knowledge (N = 159)

Variable	Category	<7 (Inadequate) n (%)	≥7 (Adequate) n (%)	Chi-Square (p-value)
Age (years)	<20	4 (30.8)	9 (69.2)	0.538 (0.764)
	21–30	19 (22.1)	67 (77.9)	
	31–40	13 (21.7)	47 (78.3)	
Education	Uneducated/illiterate	2 (66.7)	1 (33.3)	9.422 (0.024) *
	Preparatory	6 (50.0)	6 (50.0)	
	High school	10 (21.3)	37 (78.7)	
	University	18 (18.6)	79 (81.4)	
Number of Pregnancies	First	10 (29.4)	24 (70.6)	1.641 (0.440)
	Second	9 (25.0)	27 (75.0)	
	Third	17 (19.1)	72 (80.9)	
Month of Pregnancy	First trimester	14 (27.5)	37 (72.5)	1.077 (0.584)
	Second trimester	10 (21.7)	36 (78.3)	
	Third trimester	12 (19.4)	50 (80.6)	
Expected Oral Health Status	Good	15 (18.5)	66 (81.5)	3.386 (0.184)
	Accepted	17 (24.6)	52 (75.4)	
	Bad	4 (44.4)	5 (55.6)	
Visiting a Dentist During Pregnancy	No	28 (30.8)	63 (69.2)	8.025 (0.005)*
	Yes	8 (11.8)	60 (88.2)	

**Significant at $p < 0.05$*

Discussion

The present study assessed oral health knowledge, attitudes, and practices (KAP) among 159 pregnant women in Gharyan city, Libya. The findings indicate that the majority of participants were aged 21–30 years (54.1%) and had university-level education (61.0%). More than half of the women were in their third or subsequent pregnancy (56.0%), and 39.0% were in the third trimester. Despite this, less than half (41.5%) reported visiting a dentist during pregnancy, reflecting suboptimal utilization of dental services despite relatively high educational attainment and pregnancy experience.

Regarding oral health knowledge, 77.4% of participants demonstrated adequate knowledge (score ≥7). Most women recognized that candy consumption contributes to tooth decay (83.0%) and were aware of the relationship between oral and general health (86.2%). However, knowledge of preventive measures, including the benefits of fluoride toothpaste (37.7%) and other oral hygiene methods (39.0%), was limited. Oral health practices were similarly suboptimal, as only 36.5% reported brushing twice daily and 20.8% visited the dentist regularly. These findings are consistent with studies in other developing countries showing that awareness of oral health does not always translate into preventive practices among pregnant women (11,12).

Education level and visiting a dentist during pregnancy were significantly associated with higher oral health knowledge in the current study ($p = 0.024$ and $p = 0.005$, respectively), whereas age, parity, trimester, and perceived oral health status were not. This aligns with previous evidence suggesting that formal education enhances oral health literacy, and direct contact with dental professionals reinforces awareness and motivates preventive behaviors (13,14). The lack of significant associations with age and parity suggests that demographic factors alone may be insufficient to predict knowledge levels, highlighting the importance of targeted health education interventions.

Comparative studies support these observations. reported that 55.8% of pregnant women in South India had inadequate oral health knowledge, with education and parity being significant predictors, whereas age was not(14). Similarly, in Egypt, 67.2% of pregnant women demonstrated fair knowledge about oral health, but misconceptions regarding maternal tooth loss and fetal calcium absorption persisted, paralleling the gaps observed in our study regarding preventive practices (15). Conversely, an Egyptian study reported unsatisfactory oral health knowledge in 75% of pregnant women with no association with socio-demographic factors, emphasizing the variability across populations and the potential influence of local educational and healthcare infrastructures(16).

The findings of limited preventive practices despite adequate knowledge may be partly explained by misconceptions about the safety of dental care during pregnancy, as reported in previous studies (11,17). Fear of harming the fetus and concerns about infection are common barriers that prevent women from seeking routine dental care, despite recognizing the importance of oral health. This highlights the need not only for knowledge dissemination but also for assurance regarding the safety and necessity of dental care during pregnancy.

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Overall, the study underscores the critical role of structured oral health education programs targeting pregnant women, particularly emphasizing preventive care, fluoride use, and routine dental visits. Interventions should prioritize women with lower educational levels and those who have limited contact with dental services, as these groups are more likely to exhibit gaps in knowledge and practices(11,13). Ensuring that oral health education is incorporated into antenatal care programs could bridge the gap between knowledge and practice, ultimately improving maternal and infant oral health outcomes.

Limitations

The study was conducted in a single city and relied on self-reported questionnaires, which may be subject to recall and reporting bias. Additionally, clinical assessment of oral health was not performed, limiting the ability to correlate knowledge and practices with actual oral health status. Future studies should include larger, multi-center samples and objective clinical measures to validate the findings.

Conclusion

While most pregnant women in Gharyan city demonstrated adequate oral health knowledge, gaps persist in preventive practices, particularly regarding fluoride use and dental visits. Education level and dental visits during pregnancy were significant determinants of knowledge. These findings highlight the need for targeted oral health education programs and increased access to dental services for pregnant women to improve oral health outcomes for both mothers and their infants.

Conflicts of Interest

The authors declare no conflicts of interest.

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