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Original Article

Association between Oral Health Status with Oral Hygiene Behavior and Practice among Pregnant Women Attending in Hospitals of Bangladesh

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ABSTRACT

Background: Pregnancy is a critical period during which hormonal and behavioral changes increase susceptibility to various oral health problems. Poor oral hygiene and lack of awareness among pregnant women can exacerbate conditions such as gingivitis, tooth decay, and gum inflammation. Understanding the associations between oral health status and oral hygiene practices is essential to guide preventive care during pregnancy. **Objectives:** To assess the association between oral health status and oral hygiene behavior also practice among pregnant women attending hospitals in Bangladesh and to identify socio-demographic and behavioral factors influencing oral health problems. **Materials and methods:** A cross-sectional study was conducted among 206 pregnant women selected from different hospitals in Bangladesh. Data were collected through a pre tested structured questionnaire covering the socio-demographic characteristics, pregnancy-related information, oral hygiene practices, and self-reported oral health problems. Statistical analysis was performed using SPSS software, applying descriptive statistics and Chi-square tests to examine associations, with a significance level set at $p < 0.05$. **Results:** Overall, 69.3% of participants reported at least one oral health problem, most commonly tooth sensitivity (65.0%), tooth decay (53.4%), swollen gums (41.3%), painful or reddish gums (37.4%), gum bleeding (33.4%), and dental caries (26.7%). A significant association was observed between pregnancy trimester and gum problems—bleeding ($p = 0.000$), swollen ($p = 0.015$), painful ($p = 0.031$), and reddish gums ($p = 0.001$). Awareness about pregnancy gingivitis was significantly related to educational level ($p = 0.036$), while bleeding gums were associated with monthly income ($p = 0.032$). Brushing frequency ($p = 0.010$), type of cleaning material ($p = 0.009$), and frequency of consuming sugary foods ($p = 0.004$, $p = 0.041$) showed significant associations with different gum problems, whereas dental visit timing showed no significant relationship ($p > 0.05$). **Conclusion:** Oral health problems were highly prevalent among pregnant women and were significantly associated with pregnancy trimester, socioeconomic status, brushing habits, and dietary practices. Educational interventions and integration of oral health counseling into antenatal care are recommended to improve awareness and promote better oral hygiene behaviors during pregnancy.

KEYWORDS: *pregnancy, oral health, gingivitis, oral hygiene, maternal health, Bangladesh*

INTRODUCTION

Pregnancy is a unique physiological condition characterized by complex hormonal, physical, and behavioral changes that can significantly influence oral health. Hormonal fluctuations, particularly in estrogen and progesterone levels, can alter the gingival response to local irritants, predisposing women to various oral conditions such as gingivitis, periodontitis, and tooth decay.[1,2] These oral health issues not only affect maternal well-being but may also have adverse implications for fetal outcomes, including preterm birth and low birth weight.[3,4] Oral health during pregnancy often remains neglected, particularly in low- and middle-income countries like Bangladesh, where limited awareness and socio-economic barriers contribute to poor oral hygiene practices.[5] Pregnant women may avoid dental visits due to misconceptions, lack of access, or low prioritization of oral care during this period.[6,7]Understanding the relationship between oral hygiene practices and oral health problems among pregnant women is essential for developing preventive strategies and educational interventions.[8,9] This study aimed to assess the association between oral health status and oral hygiene behavior among pregnant women attending hospitals in Bangladesh and to identify the key socio-demographic and behavioral predictors of oral health problems in this population.

MATERIALS AND METHODS

A cross-sectional study was conducted among 206 pregnant women attending selected hospitals in Bangladesh to assess the association between oral health status and oral hygiene behaviors. Participants were selected through a convenient sampling method based on inclusion criteria of being currently pregnant, aged 17–40 years, and willing to provide informed consent, while women with systemic diseases or undergoing antibiotic therapy were excluded. Data were collected using a structured, pretested questionnaire that covered the socio-demographic variables (age, education, occupation, and income), pregnancy-related information (trimester and parity), oral hygiene behaviors (tooth brushing frequency, cleaning materials used, sugar consumption, and dental visit habits), and self-reported oral health problems (tooth decay, gum bleeding, swelling, pain, redness, and caries). Statistical analysis was performed using SPSS software, where descriptive statistics (frequency, percentage, mean, and standard deviation) were calculated, and associations between oral health problems and independent variables were examined using the Chi-square test with a significance level set at $p < 0.05$. Ethical approval for the study was obtained from the Institutional Ethical Review Board (IRB) of National Institute and Preventive and Social Medicine (NIPSOM) and the reference number is NIPSOM/IRB/2017/09. Also written informed consent was obtained from all participants, ensuring confidentiality and voluntary participation.

RESULTS

Table 1: Demographic characteristics of pregnant women (n = 206)

Variables	Category	n (%)
Age (in years)	18–25	109 (52.9)
	26–35	91 (44.2)
	≥36	6 (2.9)
	Mean (± SD): 25.5 ± 5.3 years; **Range:** 17–40 years	
Education	No schooling	25 (12.1)
	Up to higher secondary	153 (74.3)
	Graduation	28 (13.6)
Occupation	Housewife	179 (86.9)
	Working	27 (13.1)
Pregnancy stage	1st trimester	51 (24.8)
	2nd trimester	80 (38.8)
	3rd trimester	75 (36.4)
Parity	First pregnancy	96 (46.7)
	Has other children	110 (53.3)

Table 1 presents the demographic characteristics of 206 pregnant women. Over half of the participants (52.9%) were aged 18–25 years, with a mean age of 25.5 ± 5.3 years (range: 17–40 years). The majority had education up to higher secondary level (74.3%) and were housewives (86.9%). Most respondents were in their second (38.8%) or third (36.4%) trimester of pregnancy, and slightly more than half (53.3%) had previous children

Figure 1 : Oral health status of pregnant women through dental checkup [n=206]

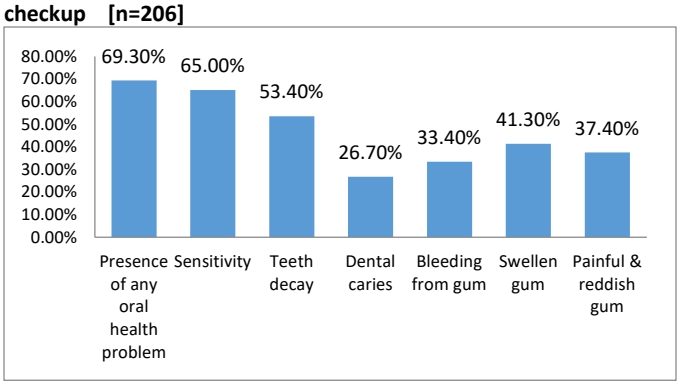

Figure 1 illustrates the distribution of oral health status of pregnant women. Overall, 69.3% of participants experienced at least one oral health issue. The most frequently reported conditions included tooth sensitivity (65.0%), tooth decay (53.4%), swollen gums (41.3%), painful and reddish gums (37.4%), gum bleeding (33.4%), and dental caries (26.7%).

Table 2: Associations between oral health status and socio-demographic factors among pregnant women (n=206)

Variables	Oral Health Problems	p value	Significance
Age	Decayed/caries teeth, Filled teeth, Missing teeth	0.033, 0.043, 0.020	Significant
Pregnancy trimester	Bleeding, Swollen, Painful, Reddish gum	0.000, 0.015, 0.031, 0.001	Significant
Educational qualification	Swollen, Reddish gum	>0.05	Not significant
Education level	Awareness about pregnancy gingivitis	0.036	Significant
Monthly family income	Bleeding gum	0.032	Significant

Table 2 summarizes the major statistically significant associations between oral health status and socio-demographic factors among pregnant women. Age, trimester of pregnancy, educational level, income showed significant relationships with different oral health problems.

Table 3 : Association between oral hygiene behavior and oral health status of pregnant women

Oral hygiene behavior	Oral Health Problems	p value	Significance
Tooth brushing frequency	Bleeding gum	0.010	Significant
Cleaning material	Painful gum	0.009	Significant
Sugar consumption	Bleeding, Swollen gum	0.004, 0.041	Significant
Dental visit	Bleeding, Swollen gum	0.12.0.07	Not significant

Table 3 summarizes the major statistically significant associations between oral health status and oral hygiene behavior of pregnant

women. Tooth brushing frequency, type of cleaning material and sugar intake showed significant relationships with different oral health problems.

DISCUSSION

This study revealed a high prevalence (69.3%) of oral health problems among pregnant women, with tooth sensitivity, tooth decay, and gum-related issues being the most common. These findings align with studies conducted in other low-resource settings, where hormonal changes and poor oral hygiene behaviors were identified as key contributors to oral diseases during pregnancy.[1-3] A significant association was found between pregnancy trimester and gum problems. Bleeding gum ($p = 0.000$), swollen gum ($p = 0.015$), painful gum ($p = 0.031$), and reddish gum ($p = 0.001$) were all significantly related to pregnancy stage, indicating that gum problems were more prevalent in early trimesters. Similar findings have been reported by Rakchanok et al.[8] who observed that gingival inflammation tends to increase in early pregnancy due to heightened hormonal effects. Awareness about pregnancy gingivitis was significantly associated with educational qualification ($p = 0.036$), suggesting that higher education was linked with better awareness. This reinforces previous findings that education influences health-seeking behavior and self-care practices.[4,5] Monthly family income was significantly associated with bleeding gums ($p = 0.032$), where participants with lower income (<10,000 Tk/month) had higher prevalence of bleeding gums. Economic disparities often limit access to dental services and preventive care, which may explain this association.[7] Frequency of tooth brushing was significantly associated with bleeding gums ($p = 0.010$), but not with swollen, painful, or reddish gums ($p > 0.05$). Participants who brushed only once daily had higher gum bleeding prevalence compared to those brushing twice or more daily. This finding is consistent with previous research indicating that brushing frequency is inversely related to gingival bleeding.[10]

The type of cleaning material used was significantly associated with painful gums ($p = 0.009$). Participants using only toothbrush and toothpaste had lower prevalence of painful gums than those using traditional materials (e.g., powder or others). However, no significant association was found between cleaning materials and other gum problems ($p > 0.05$). Regular tooth brushing using fluoridated toothpaste is a well-established preventive measure against gingival inflammation.[9]Regularity of consuming sugar containing snacks or drinks between meals was significantly associated with bleeding gums ($p = 0.004$) and swollen gums ($p = 0.041$). Those who consumed sugary foods more frequently had a higher prevalence of gum related problems, which aligns with the established link between sugar intake and oral microbial activity.[11,12]

No significant associations were observed between reason or timing of dental visits and gum problems, including bleeding and reddish gums ($p > 0.05$). This suggests that despite having oral health issues, most pregnant women may not seek timely professional care, possibly due to lack of awareness or misconceptions about dental treatment during pregnancy.[6,13] Overall, these findings highlight the need for oral health education and integration of dental screening into routine antenatal care programs. Improving awareness, encouraging regular tooth brushing, and reducing sugary snack intake could significantly reduce oral health problems during pregnancy.

CONCLUSION

This study demonstrates a strong association between oral health problems and both socio-demographic and behavioral factors among pregnant women in Bangladesh. Gum related problems were significantly linked to pregnancy trimester, brushing frequency, type of cleaning material, and sugar consumption. Education and income also played important roles in determining awareness and oral health status. Integrating oral health counseling into antenatal care, promoting preventive oral hygiene practices, and increasing access to affordable dental services can help improve maternal oral health outcomes and overall pregnancy well-being.

CONFLICT OF INTEREST: The authors declare no conflict of interest.

FUNDING: This research received no external funding.

DATA AVAILABILITY STATEMENT: The data presented in this study are available on reasonable request from the corresponding author

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