Original Article

Gingivitis and Oral Health Practices among Pregnant Women

Sonia A.S.[1], Siddiqua F.[2]

Abstract

Purpose: Gingivitis is a more familiar oral health issue among pregnant women, mainly due to the hormonal rush and increased susceptibility to plaque-induced inflammation. The study aimed to assess the prevalence of gingivitis and evaluate oral health practices among pregnant women.

Methods: A descriptive type of cross-sectional study was conducted on 206 pregnant women in OPD, Gynae and Obs, Mugda Medical College Hospital and Maternal & Child Health Training Institute, Azimpour, Dhaka from 1st January to 31st December 2022. In order to collect data, a face-to-face interview was conducted by using a pretested semi-structured questionnaire. Clinical examination was carried out in daylight and the descriptive statistics included the frequencies, percentages, mean, median and standard deviation of the findings, while the inferential statistics included a chi-square test to find out the association between socio-demographic, oral health practices and dental visits of pregnant women with gingivitis.

Results: An association between socio-demographic factors with oral health factors showed statistically not significant (P) value but association between pregnancy trimester with bleeding gum, swollen gum, painful gum and reddish gum of participants. Chi-square test shows the association is statistically significant (P0.05) and value are (0.000, 0.015, 0.031 & 0.001). Another association between oral hygiene practice and dental visit factor showed a non-significant P-value.

Conclusion: Step-wise approaches are required during each trimester of pregnancy and dental check-ups should be incorporated into antenatal check-ups.

Keywords: Gingivitis, OPD, Antenatal check-ups

Journal of Dentistry and Allied Science, Vol 8, No 2
Article Received: 17 Apr 2025, Accepted: 16 Jun 2025
DOI: https://doi.org/10.3329/jdas.v8i2.85820

1. **Zinat Ara Sonia**, Lecturer, Dhaka Dental College, Mirpur 14, Dhaka
2. **Fahmida Siddiqua**, Lecturer, Dhaka Dental College, Mirpur-14, Dhaka

***Corresponding Author**
Dr. Fahmida Siddiqua, Lecturer, Dhaka Dental College, Mirpur-14, Dhaka
E-mail: drfahmida85@gmail.com
Orcid id no: 0009-0008-7792-7257

Introduction

Pregnancy is a unique stage of life where a wide range of emotional and physiological changes occur in various body areas, including the oral cavity and dental health [1]. The oral cavity of a female undergoes significant physiological and endocrine changes during pregnancy. Pregnancy is a significant life event for each female, which is linked to physiological changes that primarily influence the endocrine, cardiovascular, and hematological systems as well as frequently affect attitude, mood, or behavior. Pregnancy causes a wide range of changes from the early stage of periodontitis, which is termed as gingivitis, to the aggressive form of periodontitis. Earlier conducted studies have shown that, during pregnancy elevated levels of estrogen and progesterone evoke gingival responses which in turn lead to gingivitis [2]. Undiagnosed or untreated pregnancy gingivitis in association with periodontal involvement eventually can lead to adverse impacts like preterm birth and low birth weight [3]. Oral health is frequently neglected during prenatal treatment, though it's known adverse effect. Women's oral health internal environment is influenced by several sociodemographic factors, such as cultural beliefs, educational attainment, and access to dental care [4]. Many pregnant women reported that they received little to no oral health education, which eventually results in poor oral hygiene habits and a delay in seeking treatment [5]. To avoid detrimental effects, it is crucial to have knowledge about the frequency of gingivitis and understanding patterns in oral health behaviors during pregnancy. Elevating the level of awareness and incorporating a dental check-up into the scheme of prenatal care can lessen fetal outcomes and improve maternal overall health.

This article amalgamated the connection between gingivitis and oral health practices among pregnant women, designed to recognize vital threats and foster preclusion policies. Current literature also sheds light on the necessity of a multidisciplinary approach to maternal oral health during the pregnancy time frame.

Methods

It was a descriptive type of cross-sectional study. The study was conducted among pregnant women in OPD, Gynae and Obs, Mugda Medical College Hospital, Dhaka and OPD, Maternal and Child Health Training Institute, Azimpour, Dhaka from 1st January to 31st December 2022. In order to collect data, a semi-structured questionnaire was prepared considering the variables and objectives of the study. Face to face interview was conducted using the pretested semi-structured questionnaire. Clinical examination was carried out in daylight and records were written down on paper forms. Dental mirror, explorer, and torchlight were used for clinical examination then translated into Bangla version and data were collected in the real fields. Before data collection, pre-testing of the questionnaire had been done in Surjer Hasi Clinic Aftab-nogor, Dhaka. The sample size was 35. According to the findings of pre-testing, necessary modifications were done to the questionnaire. After collection, the data were cleaned, coded, and categorized. The master tabulation sheet was prepared after proper checking, verifying, and editing as per specific objectives and variables. Data analysis was done on a computer by using Statistical Package Science (SPSS) software. The descriptive statistics included the frequencies, percentages, mean, median, and standard deviation of the findings, while the inferential statistics included a chi-square test to find out the association between socio-demographic, oral health practices, and dental visits of pregnant women with gingivitis.

Results

Socio-demographic factors:

Figure 1: Distribution of participants according to their age (n=206)

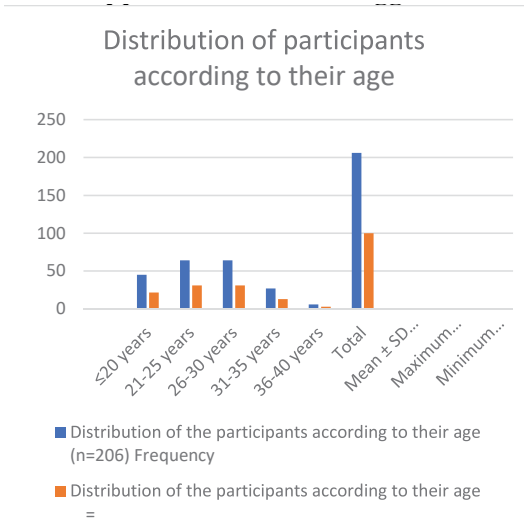

Figure 1 shows that 31.1% participants were in 21-25 years; 31.1% participants were in 26-30 years; 21.8% participants were in ≤ 20 years; 13.1% participants were in 31-35 years and 2.9% participants were in 36-40 years respectively. The mean age of the respondents was 25.48 years, with a minimum age 17 years, maximum age 40 years and standard deviation 5.298.

Figure 2: Distribution of the participants according to their occupation (n=206)

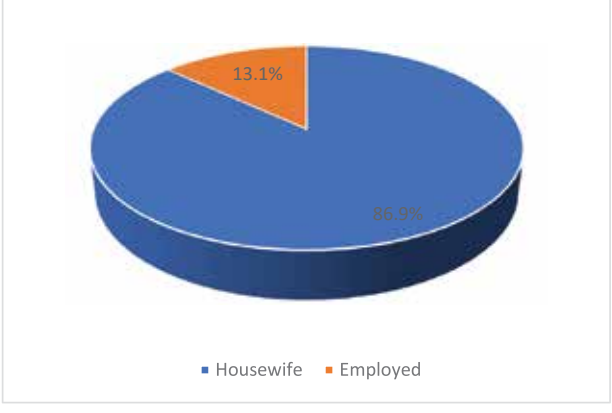

Figure 2 shows that 86.9 % of the respondents were house wives and 13.1% were employed.

Figure 3: Distribution of the participants according to their educational qualification (n=206)

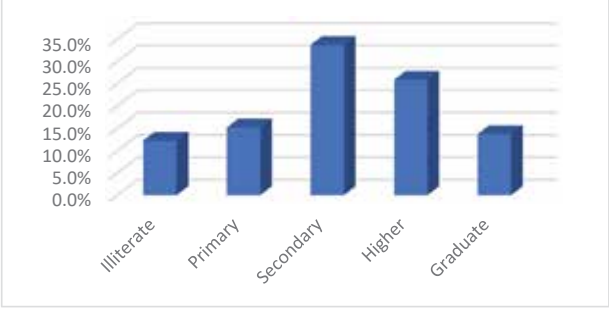

Figure 3 shows that 33.5% of participants educational qualification was up to secondary; 25.7% of participants educational qualification was up to higher secondary; 15.0% participants' educational qualification

was up to primary; 13.6% of participants educational qualification was up to graduate; and 12.1 % participants' educational qualification was illiterate.

Figure 4: Distribution of the participants according to their monthly family income (n=206)

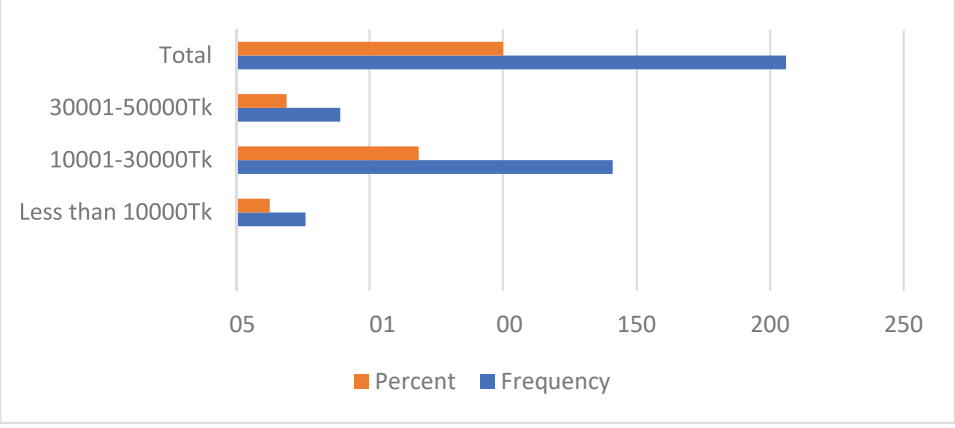

Figure 4 shows that 68.4% of participants monthly family income was 10001-30000Tk; 18.9% of participants monthly family income was 30,001–50,000Tk and 12.6 % of participants monthly family income was less than 10000Tk respectively.

Figure 5: Distribution of the participants according to their pregnancy trimester (n=206)

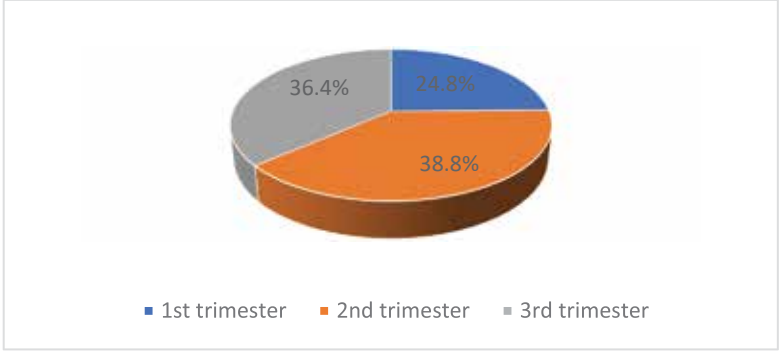

Figure 5 shows that 38.8% of women were in the 2nd trimester, 36.4% were in the 3rd trimester, and 24.8% of participants were in the 1st trimester.

Oral health practices factors:

Table 1: Distribution of participants according to their oral health practices factors (n=206)

Oral Health Variables (n=206)		Frequency	Percentage
Distribution of the participants according to frequency of daily tooth brushing	Once a day	162	78.6
	Twice a day	36	17.5
	More than twice	8	3.9
Distribution of the participants according to regularity of brushing teeth	Yes	109	52.9
	No	97	47.1

Distribution of the participants according to cleaning teeth ingredients	Tooth brush & tooth paste	103	50
	Tooth brush & powder	41	19.9
	Mouth wash and dental floss	37	18
	Others	25	12.1
Distribution of the participants according to brushing time in minutes	1-2 min/mins	8	3.9
	2-3 mins	81	39.9
	3-4 mins	109	52.9
	More than 5 mins	8	3.9
Distribution of the participants according to use of type of tooth paste	Fluoridated tooth paste	138	67.0
	Non-fluoridated tooth paste	49	23.8
	Others	19	09.2
Distribution of the participants according to practices between meal	Brush teeth	23	11.2
	Rinse with water	47	22.8
	Nothing	136	66.0
	Total	**206**	**100**

Dental visit factors:

Figure 6: Distribution of participants according to visit a dentist during pregnancy time (n=206)

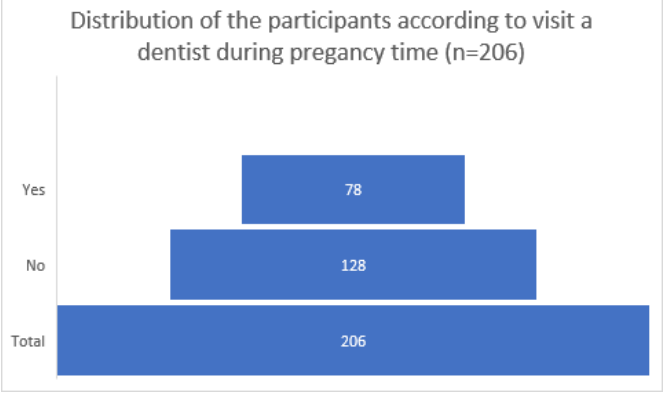

Figure 6 shows that 62.1% participants did not visit a dentist and 37.9% participants visited a dentist during pregnancy.

Figure 7: Distribution of participants according to last dental visit (n=206)

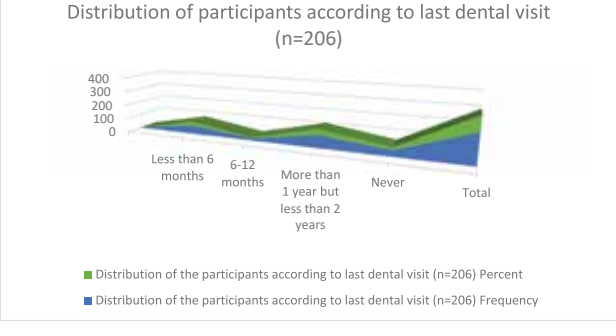

Figure 7 shows that 42.7% participants went to last dental visit in more than 1 year but less than 2 years; 30.1% participants went to last dental visit in less than 6 months; 20.4% participants never went for a dental visit and 6.8% within 6-12 months respectively.

Figure 8: Distribution of the participants according to the reason of last dental visit (n=206)

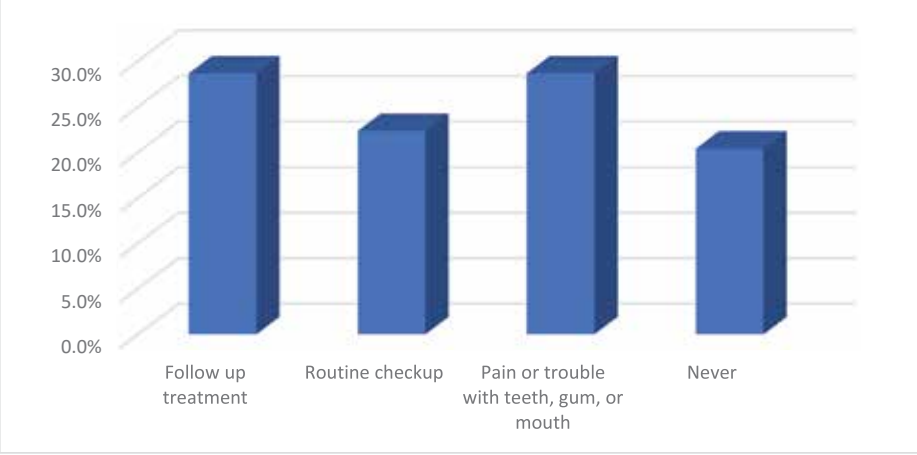

Figure 8 shows that 28.6% participants reason for last dental visit was pain or trouble with teeth, gum or mouth; 22.3% participants routine checkup and 20.4% never went for a dental visit respectively.

Oral health problems:

Table 2: Distribution of the participants according to starting time of the oral health problem (n=206)

Starting time of oral health problem of respondent	Frequency	Percent
Before pregnancy	135	65.5
After pregnancy	71	34.5
Total	206	100.0

Table 2 shows that 65.5% participants oral health problem started before pregnancy and 34.5% participants oral health problem started during pregnancy.

Figure 9: Distribution of the participants according to the presence or absence of teeth problems (n=206)

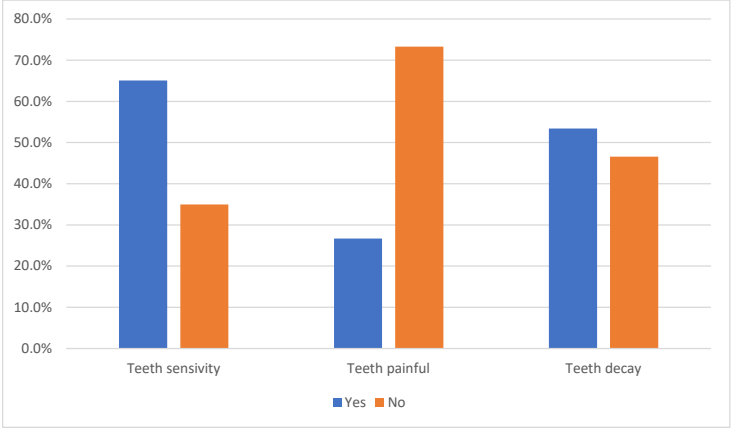

Figure 9 shows that 65.0% participants had teeth sensitivity problem; 53.4% participants had teeth decay and 26.7% participants had painful teeth problem.

Figure 10: Distribution of the participants according to gum problems (n=206)

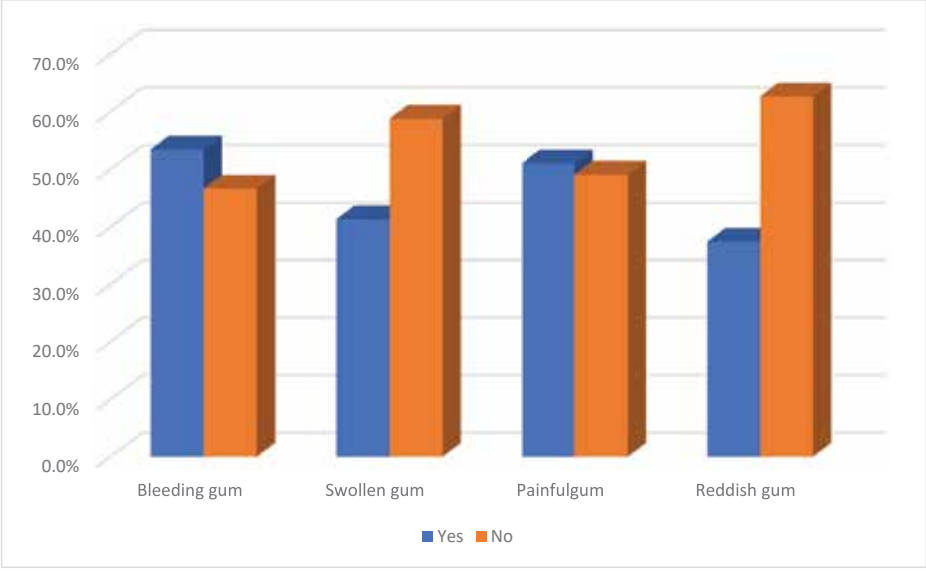

Figure 10 shows that 53.4% participants had bleeding gum; 51.0% participant's had painful gum; 41.3% participants had swollen gum and 37.4% participants had reddish gum related problem respectively.

Inferential Statistics

Association between socio demographic factors and oral health problems

Table 3: Association between age group with bleeding gum and swollen gum of the participants (n=206)

Age group of the respondent	**Bleeding gum**			**P value**
	Yes (n%)	**No (n%)**		
20 years	24 (53.3%)	21 (46.7%)	4.369	.355
21-25 years	39 (60.9%)	25 (39.1%)		
26-30 years	34 (53.1%)	30 (46.9%)		
31-35 years	10 (37.0%)	17 (63.0%)		
36-40 years	3 (50.0%)	3 (50.0%)		
	Swollen gum			

20 years	13 (28.9%)	32 (71.1%)	6.730	.151
21-25 years	31 (48.4%)	33 (51.6%)		
26-30 years	30 (46.9%)	34 (53.1%)		
31-35 years	8 (29.6%)	19 (70.4%)		
36-40 years	3(50.0%)	3 (50.0%)		

Table 3 shows the association between age group with bleeding gum and swollen gum of the participants. Chi-square test shows the association is statistically not significant (P).

Table 4: Association between pregnancy trimester with bleeding gum, swollen gum, painful gum and reddish gum of the participants (n=206)

Pregnancy trimester	**Bleeding gum**			**P value**
	Yes (n%)	**No (n%)**		
1st trimester	38 (74.5%)	13 (25.5%)	15.679	.000
2nd trimester	43 (53.7%)	37 (46.3%)		
3rd trimester	29 (38.7%)	46 (61.3%)		
	Swollen gum			

1st trimester	17 (33.3%)	34 (66.7%)	8.416	.015
2nd trimester	43 (53.8%)	37 (46.2%)		
3rd trimester	25 (33.3%)	50 (66.7%)		
	Painful gum			
1st trimester	22 (43.1%)	29 (56.9%)	6.966	.031
2nd trimester	50 (62.5%)	30 (37.5%)		
3rd trimester	33 (44.0%)	42 (56.0%)		
	Reddish gum			
1st trimester	30 (58.8%)	21 (41.2%)	14.862	.001
2nd trimester	28 (35.0%)	52 (65.0%)		
3rd trimester	19 (25.3%)	56 (74.7%)		

Table 4 shows the association between pregnancy trimester with bleeding gum, swollen gum, painful gum and reddish gum of participants. Chi-square test shows the association is statistically significant (P0.05).

Table 5: Association between educational qualification with awareness that can develop pregnancy gingivitis during pregnancy (n=206)

Educational qualification	Awareness about pregnancy gingivitis				P value
	Yes (n%)	No (n%)	I am not fully aware, but heard about it (n%)		
Illiterate	8 (32.0%)	8 (32.0%)	9 (36.0%)		
Primary	10 (32.3%)	5 (16.1%)	16 (51.6%)		
Secondary	26 (37.7%)	12 (18.8%)	30 (43.5%)	16.505	.036
Higher	28 (52.8%)	5 (9.4%)	20 (37.7%)		
Graduate	18 (64.3%)	1 (3.6%)	9 (32.1%)		

Table 5 shows the association between educational qualification with awareness that can develop pregnancy gingivitis during pregnancy. Chi-square test shows the association is statistically significant (P0.05).

Table 6: Association between monthly family income with bleeding gum of the participants (n=206)

Monthly family income	Bleeding gum			P value
	Yes (n%)	No (n%)		
Less than 10000Tk	20(76.9%)	6 (23.1%)		
10001-30000Tk	69(48.9%)	72 (51.1%)		
30001-50000Tk	21 (53.8%)	18 (46.2%)	6.914	.032

Table 6 shows the association between monthly family income with bleeding gum of the participants. Chi-square test shows the association is statistically significant (P0.05).

Association between oral health practices and problems

Table 7: Association between frequency of tooth brushing with swollen gum, painful gum and reddish gum of the participants (n=206)

Frequency of tooth brushing	Swollen gum			P value
	Yes (n%)	No (n%)		
Once a day	68 (42.0%)	94 (58.0%)	.909	.635
Twice a day	15 (41.7%)	21 (58.3%)		
More than twice	2 (25.0%)	6 (75.0%)		
	Painful gum			
Once a day	88 (54.3%)	74 (45.7%)	3.911	.141
Twice a day	13 (36.1%)	23(63.9%)		
More than twice	4 (50.0%)	4 (50.0%)		
	Reddish gum			
Once a day	59 (36.4%)	103 (63.6%)	.643	.725
Twice a day	14 (38.9%)	22 (61.1%)		
More than twice	4 (50.0%)	4 (50.0%)		

Table 7 shows the association between frequency of tooth brushing with swollen gum, painful gum and reddish gum of the participants. Chi-square test reveals that the test is statistically not significant (P

Association between dental visit and oral health problems

Table 8: Association between last dental visit with reddish gum of the participants (n=206)

Last dental visit	Reddish gum			P value
	Yes (n%)	No (n%)		
Less than 6 months	18 (29.0%)	44 (71.0%)	3.886	.274
6-12 months	4 (28.6%)	10 (71.4%)		
More than 1 year but less than 2 years	36 (40.9%)	52 (59.1%)		
Never	19 (45.2%)	23 (54.8%)		

Table 8 shows association between last dental visit with reddish gum of the participants. Chi-square test is statistically not significant (P 0.05).

Discussion

The mouth served as a mirror to general health and also as a portal for diseases to the rest of the body. Gingivitis aggravated due to increase in hormone (estrogen and progesterone) levels, alteration in oral flora and a decreased immune response, thus reducing the body's ability to repair and maintain healthy gingival tissue. Many studies had reported an increase in subgingival growth of Provetella intermedia during the 2nd trimester of pregnancy which may be responsible for increased inflammation.

To attain the objectives of present study 206 pregnant women were interviewed along with semi structured questionnaire on the basis of different variables. The present study showed that 31.1% of pregnant women were in 21-25 years age group; 21.8%and 13.1% were in age group 20 years and 31-35 years respectively. The mean age of pregnant women were 25.48 years. There findings were in contrast to the study was done by (Gupta et al., 2014) [6]. in Dhaka city. Here showed that larger proportion of respondents (72%) had fallen within the age group of 20-24 years.19% of the respondents represented the age group of 15-19years,8% respondents were within the range of 30-34years and only 1% of respondents correspond to the age group of above 35 years.

This study showed that 64.3% graduate educated pregnant women had awareness about pregnancy gingivitis,52.8% higher educated participants had awareness about pregnancy gingivitis. These findings were contrast to the study was done by (Togoo *et al*., 2019) [7]. In that study majority (42.62%) of the pregnant women had just heard about developing pregnancy gingivitis and they were not fully aware about it and

31.47% had not even heard about it.

Almost half of the respondents (46%) reported that they had symptoms of gingivitis during their pregnancy. Bleeding gum was the most frequent symptom (53.4%). Either alone or in combination with painful gum, swollen gum and reddish gum were 51.0%,41.3% and 37.4% respectively. The percentage of bleeding gum74.5% was more in 1st trimester, painful gum 62.5% was more in 2nd trimester, reddish gum 58.8% was more in 1st trimester and swollen gum 53.8% was more in 2nd trimester. The study showed that 65.0% had teeth sensitivity problem and 53.4% had teeth decay problem. This finding was consistent with other studies.

The present study revealed that 50.0% participants cleaned their teeth with brush and paste,19.9% used tooth brush and powder and 18.0% used mouthwash and dental floss. In this study 52.9% participants brushed their teeth in 3-4 minutes and 39.3% brushed their teeth in 2-3 minutes.78.6% participants brushed their teeth once a day and 17.5% twice a day respectively. This finding was consistent with other studies(Nabi *et al*., 2021)[8].

The present study revealed that 73.2% participants ate sugar containing snacks or drink between meal had more bleeding gum and 58.5% had more swollen gum. About 55.3% participants ate sugar containing snacks and drinks,19.9% ate once a day and 5.3% ate never sugar containing snacks and drinks between meal. A study was done in Iran showed that women who had brushed their teeth less than once a day had significantly more decayed teeth and the study also revealed that sweet consumption more than once a day were positively related to bleeding gum (Deghatipour *et al*., 2019)[9].

This study presented that 52.9% of the participants brushed their teeth regularly and 47.1% did not maintain regularity of tooth brushing. Among them 95.1% brushed their teeth before breakfast,48.5% brushed after noon and 6.8% participants brushed their teeth after breakfast.67.0% participants brushed their teeth with Fluoridated tooth paste,23.8% non-Fluoridated tooth paste and 9.2% used other ingredients. This study was consistent with another studies. The previous study revealed that participants were not practicing oral hygiene to a satisfactory level. Most of the participants (80.5%) used to brush their teeth once daily. The reason behind brushing only once may be more extended family responsibilities and their belief that once a day is sufficient to maintain oral hygiene. The majority of the participants brushed their teeth for one minute. Fluoridated tooth paste was used (90.5%) by most of the respondents (Javali *et al*.,2022)[10].

The present study concluded that majority of the pregnant women were unaware of developing gingivitis during their pregnancy period. So, a step wise approach is required during each trimester of pregnancy and dental check-up should be incorporated into antenatal check-up.

Limitations

- The study was hospital based and there was a huge chance of response bias for the participants.
- The total assessment of oral health would include plaque index, gingival index. Considering the general body condition of the pregnant women it was not taken into account as this would require instrumental procedure.

Ethical decleration

- Formal permission was taken prior to data collection from the Ethical Committee of NIPSOM, Dhaka as well as from Mugda Medical College and Hospital, Dhaka and Maternal and Child Health Training Institute, Azimpour, Dhaka.

- The respondents were explained about the possible comfort and discomfort as well as objectives of the study.

- Informed written consent was taken before initiation of data collection. Respondents would be assured that privacy and confidentiality of data would be maintained.

No physical or chemical intervention was given to respondents. At any stage of the study, the respondents should have the right to withdraw themselves from the study for any reason.

References

1. Amit, M. P., Hooja, N., Mital, P., Salvi, A., & Fatima, A. (2014). Oral and dental health knowledge, attitude and practice among pregnant women. *Sch Acad J Biosci*, *2*(9), 627-32.
2. Wu, M., Chen, S.W. and Jiang, S.Y., 2021. Relationship between gingivitis and pregnancy: a systematic review and meta-analysis. *Oral Diseases*, 27(1), pp.1-8.
3. Xiong, X., Buekens, P., Fraser, W.D., Beck, J. and Offenbacher, S., 2006. Periodontal disease and adverse pregnancy outcomes: a systematic review. *BJOG: An International Journal of Obstetrics & Gynaecology*, 113(2), pp.135-143.
4. George, A., Dahlen, H.G., Reath, J., Ajwani, S., Bhole, S. and Korda, A., 2018. What do antenatal care providers understand and do about oral health care during pregnancy: a cross-sectional survey in New South Wales, Australia. *BMC Pregnancy and Childbirth*, 18(1), pp.1-8.
5. Thomas, N.J., Middleton, P.F. and Crowther, C.A., 2020. Oral and dental health care practices in pregnancy: a postnatal survey. *BMC Pregnancy and Childbirth*, 20(1), pp.1-8.
6. Gupta, B. and Siddiqui, A. (2014) 'To study the relationship between pregnancy , gingivitis , dental caries and periodontal disease', *Journal of Evolution of Medical and Dental Sciences*, 3(13), pp. 3516–3519. doi:10.14260/jemds/2014/2313.
7. Togoo, R. *et al.* (2019) 'Knowledge of pregnant women about pregnancy gingivitis and children oral health', *European Journal of Dentistry*, 13(02), pp. 261–270. doi:10.1055/s-0039-1693236.
8. Nabi, M., Karim, A. M. M. N., & Rashid, S. M. U. (2021). Pattern of oral diseases and associated contributing factors in pregnant women attending a maternity center in Dhaka city, Bangladesh. *Journal of Preventive and Social Medicine*, *39*(1), 50–59. https://doi.org/10.3329/jopsom.v39i1.51862
9. Deghatipour, M., Ghorbani, Z., Ghanbari, S., Arshi, S., Ehdayivand, F., Namdari, M., & Pakkhesal, M. (2019). Oral health status in relation to socioeconomic and behavioral factors among pregnant women: A community-based cross-sectional study. *BMC Oral Health*, *19*(1). https://doi.org/10.1186/s12903-019-0801-x
10. Javali, M. A., Saquib, S. A., Abdul Khader, M., Khalid, I., AlShahrani, A. Y., Kanji, M. A., & Asiri, E. (2022). Oral health knowledge, attitude, and practice of pregnant women in Deccan, South India: a cross-sectional prenatal survey. *Journal of Medicine and Life*, *15*(3), 420–424. https://doi.org/10.25122/jml-2019-0095