Determinants of Oral Hygiene Status among Selected Pregnant Women in Oyo State, Nigeria

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ABSTRACT

Background: Skipping daily oral hygiene procedures will predispose one to plaque and calculus accumulation, thus resulting in poor oral hygiene. This should not be the case during pregnancy, except for some reported cases of women who do not follow thorough oral hygiene to avoid stimulating vomiting, especially during the first trimester.

Objective: To assess some factors that influence oral hygiene status among selected pregnant women

Methodology: Three hundred and forty-five pregnant women were assessed for their oral hygiene status during their third trimester. The same procedure was carried out three and a half months after childbirth. Possible contributory factors such as socioeconomic factors, rate of dental service utilization and frequency of daily toothbrushing were assessed using a questionnaire. The oral hygiene of respondents was assessed using the simplified oral hygiene index. The index was compared before and after childbirth using students t-test and statistical significance was inferred at $p<0.05$.

Results: The majority of the respondents brush their teeth once daily (81.2%) and were in the low socioeconomic class (68.4%) with about a third being prima gravid (33.0%), but only a few (10.7%) have ever visited a dentist before. There was an improvement in the simplified oral hygiene index following childbirth, which was statistically significant.

Conclusion: Though the majority of the contributory factors that were assessed in this study did not seem to significantly influence oral hygiene status during pregnancy, women of childbearing age still need to be adequately enlightened concerning the need to optimize their oral hygiene.

Keywords: Pregnancy, Oral hygiene, Determining factors, Socioeconomic factors

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INTRODUCTION

Oral hygiene is the process of keeping the mouth clean and free of bacterial plaque, considered the main aetiologic factor in periodontal disease.[1,2] Poor oral hygiene practice will predispose one to the accumulation of plaque and calculus, which may pose aesthetic challenges as well as predispose an individual to oral and systemic diseases.[1,3] Bacterial plaque is a soft tenaciously adherent film consisting mostly of bacteria, while calculus is the mineralized form of plaque. Regular toothbrushing with an interdental cleaning procedure is essential in controlling plaque and calculus accumulation.[1] The more the accumulation of bacterial plaque and calculus in an individual, the worse the individual's oral hygiene. Factors that have been implicated in determining oral hygiene status include socioeconomic, behavioural, dental service utilization, use of tobacco, diets and the dominant hand of affected individuals.[4-7]

Pregnancy is a physiologic state that should not be associated with any pathological condition.[4,8,9] Therefore, it can be generally assumed that pregnant women should accumulate bacterial plaque at the same rate as other women, especially if they practice good oral hygiene before and during conception.[10,11] However, both anecdotal and published evidence suggests an increasing prevalence of gingival inflammation associated with pregnancy especially in areas with pre-existing gingivitis.[4,8,9] Oral alterations in pregnancy are reported to be because of physiologic changes accompanied by fluctuations in estrogen and progesterone levels, which increase oral vasculature permeability and decrease host immunity, thereby increasing susceptibility to gingivitis.[12-17] Available studies have shown gingivitis prevalence rates during pregnancy to range between 30 and 100%.[12-14,17-19] However, some factors have been reported among pregnant women that may predispose them to an increased rate of plaque accumulation and subsequently, gingival inflammation. It had been reported that some pregnant women tend to vomit during pregnancy[18] and this, coupled with the general laxity associated with pregnancy, may make it difficult for them to be motivated to maintain or follow through a thorough oral hygiene routine.[5] Additionally, pregnant women who previously used dental services before conception were reported to not use them during pregnancy.[6,17] Any woman who falls into this category will most likely accumulate plaque faster than others, thus predisposing her to poor oral hygiene. While this may be true for many pregnant women, it will not necessarily be the case for all, as many have been reported to still manage to maintain rigorous oral hygiene routines despite their pregnancy status.[7,19] Although some other microorganisms have been studied as possible causes of periodontal disease, the presence of bacterial plaque is a major pathway in the initiation and progression of periodontal disease.[20,21] Therefore, an understanding of various factors that may contribute to bacterial plaque accumulation in pregnant women will help plan appropriate intervention strategies that can help better manage periodontal disease among pregnant women. Previous studies have documented the role of behavioural factors, socioeconomic status and literacy on the oral hygiene of pregnant women.[4,6,7] Therefore, this study was conducted to assess some factors that may affect the oral hygiene status of a group of pregnant women in Oyo State, Nigeria.

METHODOLOGY

Three hundred and forty-five consecutive pregnant women were examined at the antenatal clinics of the University College Hospital and Adeoyo Maternity Center, both in Oyo State Nigeria. The same set of women were followed up and re-examined after three and half months following childbirth. Pregnant women who were otherwise healthy were included in the study. Those with systemic conditions that may compromise their immunity or affect periodontal health were excluded from the study as well as those on medications that have an effect on the periodontium. Those using any intra-oral prosthesis or tobacco in any form were also excluded. Twenty subjects were pretested two weeks before the commencement of data collection but were not included in the final study. The examination of the twenty subjects was repeated the same day with at least a one-hour interval between the repeated examinations. The pretest was used to assess the adequacy and reliability of the data collection methods and necessary modifications were made to the questionnaire. The calibration of the investigator (OI), who examined all the respondents, was done

during the pretest period. Information collected included the age of respondents, rate of dental service utilization, socioeconomic factors and frequency of daily toothbrushing. Respondents were grouped into socio-economic classes according to the official social classifications in the U.K (Rose, 1995)[22]. The classification is presented below:

- I -High socio-economic class – Professional, managerial and technical occupations
- II -Middle socio-economic class - Skilled occupations
- III -Low socio-economic class- Partly skilled and unskilled occupations

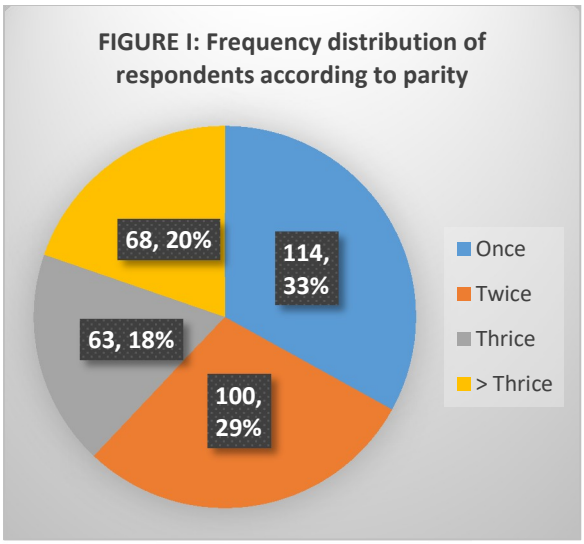
Intraoral examination was conducted with sterile periodontal probe and dental mirror under natural daylight using the simplified oral hygiene index (OHI-S) [23] by a standardized examiner (OI). The debris and calculus indices were recorded by assessing the index teeth and the simplified oral hygiene index derived from the addition of the two indices. Oral hygiene instruction was given to participants during the antenatal period. The same procedure was carried out for each of the respondents at three and half months after childbirth. The indices were compared before and after childbirth using student t-test and statistical significance was inferred at $p<0.05$. Ethical clearance was obtained from the UI/UCH joint ethical review committee. Informed consents were obtained from all the participants after the procedures had been fully explained to them.

RESULTS

The age range of respondents was 18-45 years while the mean age was 27.92 (SD ± 5.22) years. Eighty-two (23.8%) of the respondents were in the age range 20-24 years, 117 (33.9%) were in the age range 25-29 years while 92 (26.7%) were in the age range 30-34 years, and eight (2.3%) of them were above 40 years of age (Table 1).

TABLE 1: AGE DISTRIBUTION OF RESPONDENTS

Age group (Years)	Frequency	Percentage
15-19	11	3.2
20-24	82	23.8
25-29	117	33.9
25-29	92	26.7
35-39	35	10.1
>40	8	2.3
Total	345	100



One hundred and fourteen (33.0%) of the participants were prima gravid, while 100 (29.0%) have been pregnant twice, 63 (18.3%) have been pregnant thrice and the remaining 68 (19.7%) have been pregnant for more than three times (Figure 1).

The majority of the respondents 280/345 (81.2%) reportedly brushed their teeth once daily while 61 (17.7%) brushed their teeth twice daily and the remaining 4 (1.2%) claimed to be brushing their teeth after every meal (Table 2).

TABLE 2: FREQUENCY DISTRIBUTION OF SUBJECTS ACCORDING TO THEIR ORAL HYGIENE PRACTICE

Frequency of daily toothbrushing	Number of subjects (%)
Once	280 (81.2)
Twice	61 (17.7)
After each meal	4 (1.2)
Total	**345 (100)**

Thirty-seven (10.7%) of the respondents have visited a dentist before with the majority (29/37) of them having tooth extraction, two (5%) having had scaling and polishing done before and five (14%) having had multiple dental treatments. However, there was no statistically significant relationship between the Simplified Oral Hygiene Index and their oral hygiene practice and dental service utilization, both during pregnancy and during the postpartum period. Following childbirth, there was an improvement in the oral hygiene indices. In comparing the mean of the indices, there was a statistically significant

difference in the indices between pregnancy and the post-partum period (Table 3). Two-hundred and thirty-six (68.40%) were in the lower socio-economic class, 91 (26.38%) were in the middle class and the remaining 18 (5.22%) were in the high class. There was no statistically significant difference between the mean oral hygiene index based on the social classes of the subjects. The exceptional cases were the comparison of the mean for social classes 1 and 3 (p =0.002) and classes 2 and 3 (p =0.007) during pregnancy (Table 4).

TABLE 3: COMPARISON OF THE MEAN DEBRIS, CALCULUS AND SIMPLIFIED ORAL HYGIENE INDICES DURING PREGNANCY AND AT POST-PARTUM PERIOD

Index	Period	Mean	S.D	t	p-value
Debris Index	During pregnancy	1.512	0.431	7.550	< 0.001
	After childbirth	1.277	0.385		
Calculus Index	During pregnancy	1.249	0.516	3.730	< 0.001
	After childbirth	1.116	0.415		
Simplified Oral Hygiene Index	During pregnancy	2.759	0.902	5.650	< 0.001
	After childbirth	2.396	0.781		

TABLE 4: COMPARISON OF THE MEAN ORAL HYGIENE INDEX ACCORDING TO THE SOCIAL CLASSES

Period	Social class	N	Mean	SD	t	p-value
During pregnancy	1	18	2.183	0.604	1.81	0.073
	2	91	2.574	0.875		
	1	18	2.183	0.604	3.18	0.002*
	3	236	2.874	0.905		
	2	91	2.574	0.875	2.71	0.007*
	3	236	2.874	0.905		
After Childbirth	1	18	1.995	0.540	1.58	0.116
	2	91	2.296	0.767		
	1	18	1.995	0.540	0.00	1.000
	3	236	2.475	0.802		
	2	91	2.296	0.767	1.83	0.068
	3	236	2.475	0.802		

*Statistically significant

DISCUSSION

There was a statistically significant difference in the oral hygiene status of the subjects during pregnancy when compared with that of the post-partum period. The improvement in oral hygiene could have been due to a change of attitude of the respondents following the oral health talk that was given during the study. This is in line with the finding of Silness and Löe, who reported increased plaque index up to the 8th month of pregnancy after which there was a decrease,[19] the authors further reported that the plaque index at the 8th month of pregnancy exceeded that of the post-partum women.[19] The finding of Silness and Löe can however not be compared directly with that of the present study as they used different sets of subjects as control for the pregnant subjects.[19] This contrasts with the situation in the present study wherein the pregnant women were again examined following childbirth, which served as control for the pregnancy in the same set of women. This type of design serves to eliminate extraneous variations that are likely to be introduced by two different sets of women. The authors presume that the difference in the plaque index could have been due to improved oral hygiene procedures following childbirth as earlier proposed that some women avoiding the possibility of stimulating vomiting will avoid oral hygiene procedures during pregnancy.[5,17]

The frequency of toothbrushing and previous dental visits did not seem to have appreciable effects on their oral hygiene index, which may be because the majority of them were brushing once daily. Also, only a few proportions of our respondents had ever visited a dentist before the study with the majority of them visiting for extraction, which is a symptomatic treatment rather than preventive. This goes a long way in confirming what had been reported about the fact that majority seek dental care services mainly when in pain.[24-26] Previous studies have reported that irrespective of socioeconomic status, people in this environment do not so much access to dental care services compared with those in other parts of the world.[24,26] This low utilization of dental services by pregnant women is contrary to a previous study that reported better service utilization among women than their male counterparts.[26] Therefore, there is a need for dental professionals to enlighten the populace on the need to increase their preventive care services utilization, especially women of childbearing age. The fact that the majority of our respondents do not visit dentists may also be responsible for the socioeconomic factor not significantly influencing their oral hygiene status. Thus, the need for public enlightenment should not be limited to any socioeconomic class as it seems that higher social classes do not necessarily confer immunity to periodontal disease on individuals. A previous study reported that socioeconomic class did not influence the periodontal status in this environment, which is contrary to most studies.[27-29] While socioeconomic factors had been reported to significantly influence dental service utilization in many other parts of the world, a previous study in Nigeria reported a contrary finding.[27] This trend of socioeconomic class not influencing preventive service utilization and oral hygiene status need to be critically looked into for a better approach to public health enlightenment.

CONCLUSION

Though the majority of the contributory factors that were assessed in this study which included socioeconomic, rate of dental service utilization, and frequency of daily tooth brushing did not seem to significantly influence oral hygiene status during pregnancy; women of childbearing age still need to be adequately enlightened concerning the need to optimize their oral hygiene.

LIMITATION

There is a need for a study with larger and more representative sample size in order to further assess factors that influence oral hygiene status among pregnant women in Nigeria.

Source of Support

Nil

Conflict of Interest

None declared

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