

## FACTORS INFLUENCING THE ORAL HYGIENE PRACTICES OF PREGNANT WOMEN ATTENDING PUBLIC SECONDARY HEALTH FACILITIES IN BENIN CITY, NIGERIA

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### ABSTRACT

*Oral diseases cause pain and disability in all age groups and in vulnerable individuals, including pregnant women and are associated with adverse pregnancy outcomes.*

*This study assessed the factors affecting practice of oral hygiene among pregnant women attending antenatal clinic in public secondary health facilities in Benin City, Nigeria.*

*A descriptive cross-sectional study was conducted between October 2014 and October 2015 among antenatal clients accessing government owned secondary health facilities in Benin City, Nigeria, using multistage sampling technique. Data were collected using a structured, interviewer-administered questionnaire and analysed using IBM SPSS version 21.0.*

*A total of 274 respondents participated in this study. About two-fifths were in the age group 25 – 29 years (107; 39.1%), the mean age of the women was 29.2 (± 4.7) years. Over three-quarters (80.3%) were married and most of the women (94.2%) were Christians. There was a statistically significant difference in association between the level of education and monthly income of respondents / respondents' spouses and the practice of oral hygiene among respondents,  $p < 0.001$ . The associations between parity, antenatal clinic visits in the current pregnancy and respondents practice of oral hygiene were not statistically significant,  $p = 0.843$  and  $0.077$  respectively.*

*Educational level of pregnant women, socioeconomic status and obstetric characteristics may significantly influence their oral hygiene practices. Attendance at antenatal clinics offers an opportunity to educate pregnant women regarding oral health, provide preventive services and other treatment where appropriate.*

**Key Words:** Oral hygiene practices, pregnant women, antenatal, secondary health facilities.

### INTRODUCTION

Oral diseases cause pain and disability in all age groups and in vulnerable individuals, including pregnant women and are associated with adverse pregnancy outcomes.<sup>1-3</sup> Socioeconomic factors, host's systemic status, lack of resources to pay for care, barriers to access to care, and lack of public understanding of the importance of oral health and effective self-care practices all represent documented underlying reasons for observed inadequacies in oral health of pregnant women. Clinical risk factors have also been found to be associated with incidence and progression of periodontal

conditions in pregnant women.<sup>4</sup> Studies have implicated a systemic role for oral microorganisms, the quality and quantity of the host inflammatory response as key biologic processes that may underlie the association of cardiovascular disease with the clinical manifestation of periodontitis.<sup>5-9</sup>

Furthermore, maternal race, age, enrollment weight, smoking during pregnancy, marital status, food stamp eligibility, and private health insurance may influence oral health and practices. In many countries in Africa, Asia and Latin America, a shortage of oral health personnel limits the capacity of oral health care systems to provide even simple pain relief or emergency care.<sup>10,11</sup> The purpose of this study was to identify the factors influencing the oral hygiene practices among pregnant women attending antenatal clinics in secondary health facilities in Benin City, Nigeria.

### METHODOLOGY

Edo State is an inland state in central southern Nigeria with a projected population of 3.4 million

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people<sup>12</sup>. Data available show women of reproductive age (15-49 years) represent 24% (772,400) of the total population.<sup>13-15</sup>. In Benin City, there are two state-owned secondary health facilities namely: Central Hospital and Stella Obasanjo Women and Children Hospital (SOWCH) with bed compliment of 500 and 300 respectively, and located in Oredo and Ikpoba Okha Local Government Areas (LGAs) respectively. They were set up to cater for the immediate health needs of the residents of Benin metropolis, providing a range of clinical services including emergency care, promotive care, preventive care, curative as well as surgical care.

A descriptive cross-sectional study design was used in this study which was carried out from October 2014 – October 2015 and conducted on pregnant women attending antenatal clinics in Stella Obasanjo Women and Children Hospital and Central Hospital, Benin City. This study excluded pregnant women registered at the antenatal clinics in both hospitals who did not consent to be part of the study or were not in a stable state of health.

The calculated sample size,  $n = 246$ , for this study was determined using Cochran's formula for simple proportion,<sup>16</sup>  $n = Z^2pq/d^2$ , where  $d$  = degree of accuracy or precision (0.05);  $Z$  = standard normal deviate (1.96 at 95% Confidence Interval);  $p$  = proportion of the population estimated to have a good knowledge of oral health {0.8 which corresponds to the proportion(80.0%) of women surveyed in Australia who knew that fluoride in water helped to prevent tooth decay};<sup>17</sup> and  $q = 1 - p$ . With the addition of 10% non-response rate, a sample size of 274 was obtained and utilized for the study.

Multi-stage sampling technique was used to select respondents after getting a representative sample based on the average monthly antenatal clients with respect to the minimum sample size calculated, 130 respondents from Central Hospital and 144 respondents from SOWCH. The sampling techniques for the first and second stages were simple random sampling and systematic sampling respectively to scientifically select the respondents present on the days the antenatal clinic was run.

Data were collected using a quantitative tool, an interviewer-administered, structured questionnaire. For both hospitals a period of three weeks was used in administering the allocated questionnaires. All data were coded, entered and analysed using IBM SPSS version 21. A modified International Labour Organization, Standard Classification of Occupations (ILO-ISCO-08) was used to classify occupation into skill levels.<sup>18</sup>

Descriptive data were expressed as frequencies, percentages and means  $\pm$  standard deviation was analyzed and presented in the form of statements, frequency tables, bar charts and pie charts. Seven questions in the questionnaire were used to score and assess practice of

oral hygiene. The questions were about the following: teeth and mouth cleaning agents; frequency and time spent on cleaning; use and duration of change of toothbrush; use of tooth paste; visit to the dental clinic; and ways of improving oral hygiene. A percentage score  $\geq 70.0\%$  was graded as good practice, 50.0 – 69.9% as fair practice and  $\leq 50.0\%$  as poor practice. The statistical tests to determine associations were made with the use of the chi-square ( $\chi^2$ ) test and Fisher's exact test with level of significance set at  $p < 0.05$ .

### **Ethical Consideration**

Approval for the study was obtained from the Ethics and Research Committee of the University of Benin Teaching Hospital, Benin City. Permission was sought from the Heads of Department of Obstetrics and Gynaecology at the various secondary health facilities. Informed consent was obtained from the respondents and the purpose and procedure of the research was explained to them respectively. Health education on the importance of oral hygiene in pregnancy was carried out after every interview. Respondents that needed dental services were referred appropriately. Information obtained from the respondents may have been prone to self-reporting bias, attempt was made to overcome this by asking the questions repeatedly but in different forms.

### **RESULTS**

A total of 274 respondents participated in this study. About two-fifths were in the age group 25-29 years (107; 39.1%) and the age group  $\geq 40$  years had the least proportion (2.9%), the mean age and standard deviation of the women were  $29.2 \pm 4.7$  years. Benin was the predominant ethnic group among more than two-fifths (43.4%) of the respondents.

Over three-quarters, (80.3%) were married; most of the women (94.2%) were Christians, (4.7%) Muslims while 3 (1.1%) were traditional in their belief (Table 1). Three-quarters, (75.4%) of the respondents' spouses had tertiary level of education while (2.1%) had primary level of education. The association between level of education and practice of oral hygiene among respondents was statistically significant ( $p < 0.001$ ).

More than half(55.7%) had skill level 2 occupational status while those with skill level 1 were (7.4%). Over a third, (38.5%) earned more than ₦100,000 monthly income, with above one quarter, (27.9%) and (27.0%) earning between ₦18,000 – 60,000 and ₦60,000 – 100,000 respectively. (Table 2)

Over three-quarters of respondents whose spouses had tertiary level of education, 142 (77.2%) and earned monthly income greater than ₦100,000, 81(86.2%) had good practice of oral hygiene. While those with spouses who earned less than ₦18,000 had the least proportion

TABLE 1: SOCIO-DEMOGRAPHIC PROFILE OF RESPONDENTS

Variables	Frequency (n=274)	Per-cent
<b>Age group (years)</b>		
≤24	42	15.3
25-29	107	39.1
30-34	89	32.5
35-39	28	10.2
≥40	8	2.9
<b>Mean (± SD) = 29.2 (± 4.7) years</b>		
<b>Marital status</b>		
Single	27	9.9
Married	220	80.3
Co-habiting	23	8.4
Widowed	2	0.7
Divorced	1	0.4
Separated	1	0.4
<b>Religion</b>		
Christianity	258	94.2
Islam	13	4.7
ATR	3	1.1
<b>Ethnicity</b>		
Benin	119	43.4
Esan	63	23.0
Igbo	24	8.8
Yoruba	13	4.7
Owan	10	3.6
Urhobo	10	3.6
Etsako	8	2.9
Igarra	6	2.2
Hausa	5	1.8
Isoko	5	1.8
Ika	4	1.5
Itsekiri	3	1.1
Kwale	2	0.7
Igbirra	1	0.4
Igbanke	1	0.4

6 (37.5%). The association between spouses' level of education and monthly income with oral hygiene practice was statistically significant, p = 0.001. (Table 3)

Good practice of oral hygiene was reported by 76.9% of respondents who have had more than five pregnancies compared to 70.5% of those who had five pregnancies or less, with good oral hygiene practice. This association was however not statistically significant having p = 0.750. The associations between parity, Ante Natal Clinic visits in current pregnancy and respondents practice of oral hygiene were also not statistically significant (p = 0.843 and 0.077) respectively. (Table 4)

TABLE 2: SOCIO-ECONOMIC PROFILE OF RESPONDENTS' SPOUSES

Variables	Frequency (n=244)	Per-cent
<b>Level of Education</b>		
Primary	5	2.1
Secondary	55	22.5
Tertiary	184	75.4
<b>Skill Level</b>		
Skill Level 1	18	7.4
Skill Level 2	136	55.7
Skill Level 3	46	18.9
Skill Level 4	44	18.0
<b>Income Per Month (₦)</b>		
< 18,000	16	6.6
18,001 – 60,000	68	27.9
60,001 – 100,000	66	27.0
> 100,000	94	38.5

TABLE 3: FACTORS INFLUENCING THE PRACTICE OF ORAL HYGIENE AMONG RESPONDENTS

Variables	Frequency (n=274)	Per-cent
<b>How to improve oral hygiene</b>		
Twice daily brushing	126	46.0
Regular flossing	13	4.7
Tooth picking	3	1.1
Improved diet	9	3.3
Lifestyle changes	10	3.6
<b>Single dental visit</b>	5	1.8
<b>Regular dental visit</b>	69	25.2
Do nothing	39	14.2
Married	220	80.3
Co-habiting	23	8.4
Widowed	2	0.7
Divorced	1	0.4
Separated	1	0.4
<b>Visit dentist regularly</b>		
Yes	24	8.8
No	158	57.7
No response	92	33.6
<b>Reasons for not visiting dentist</b>		
Do not need it	39	14.2
Do not understand the need for it	16	5.8
Think it is not safe in pregnancy	23	8.4
Cannot afford to pay for it	26	9.5
Not part of my insurance	7	2.6
Do not have time for it	49	17.9
No response	114	41.6

TABLE 4: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS AND PRACTICE OF ORAL HYGIENE AMONG RESPONDENTS

Variables	Practice			Test Statistics
	Good	Fair	Poor	
Frequency (%)				
<b>Age group</b>				
≤24	32 (76.2)	7 (16.7)	3 (7.1)	Fisher's Exact = 10.167 p = 0.209
25 – 29	66 (61.7)	34 (31.8)	7 (6.5)	
30 – 34	67 (75.3)	18 (20.2)	4 (4.5)	
35 – 39	21 (75.0)	7 (25.0)	0 (0.0)	
≥ 40	8 (100.0)	0 (0.0)	0 (0.0)	
<b>Marital Status</b>				
Never married	34 (68.0)	14 (28.0)	2 (4.0)	$\chi^2 = 0.604$ p = 0.780
Ever married	160 (71.4)	52 (23.2)	12 (5.4)	
<b>Religion</b>				
Christian	193 (71.2)	64 (23.6)	14 (5.2)	Fisher's Exact = 3.088 p = 0.284
Other religion	1 (33.3)	2 (66.7)	0 (0.0)	
<b>Level of education</b>				
Primary	5 (50.0)	5 (50.0)	0 (0.0)	Fisher's Exact = 30.927 p < 0.001*
Secondary	51 (52.6)	38 (39.2)	8 (8.2)	
Tertiary	138 (82.6)	23 (13.8)	6 (3.6)	
<b>Skill Level</b>				
Skill level 1	60 (64.5)	28 (30.1)	5 (5.4)	Fisher's Exact = 9.817 p = 0.110
Skill level 2	76 (70.4)	24 (22.2)	8 (7.4)	
Skill level 3	51 (79.7)	13 (20.3)	0 (0.0)	
Skill level 4	7 (77.8)	1 (11.1)	1 (11.1)	
<b>Income Per Month (₦)</b>				
< 18,000	32 (48.5)	27 (40.9)	7 (10.6)	$\chi^2 = 24.708$ p < 0.001*
18,000 – 60,000	87 (73.7)	26 (22.0)	5 (4.2)	
60,001 – 100,000	34 (82.9)	7 (17.1)	0 (0.0)	
> 100,000	41 (83.7)	6 (12.2)	2 (4.1)	
<b>Ethnicity</b>				
Edo indigene	143 (69.1)	51 (24.6)	13 (6.3)	$\chi^2 = 2.731$ p = 0.281
Edo non-indigene	51 (76.1)	15 (22.4)	1 (1.5)	

\*Statistically Significant

## DISCUSSION

Pregnancy offers an opportunity to educate women regarding oral health and treat them where appropriate.<sup>19</sup> Majority of the respondents were in the age group 25-29 years which falls within the age for women of child bearing. Benin and Christianity were the predominant ethnicity and religion of the respondents. Majority of the respondents were married. These socio-demographic

findings though expected for the study locale, may influence their health beliefs and could play a significant role in the determination of health related behavior.<sup>20</sup>

Majority of the respondents had tertiary level of education. This finding was similar to a Sudan study where majority (39.3%) graduated from university<sup>21</sup>, this high literacy level and the presence of relatively advanced health care facilities would create an environ-

TABLE 5: OBSTETRIC CHARACTERISTICS OF RESPONDENTS AND PRACTICE OF ORAL HYGIENE AMONG RESPONDENTS

Variables	Practice			Test Statistics
	Good	Fair	Poor	
Frequency (%)				
<b>Gravidity</b>				
≤5	184 (70.5)	63 (24.1)	14 (5.4)	$\chi^2 = 0.775$ p = 0.750
>5	10 (76.9)	3 (23.1)	0 (0.0)	
<b>Parity</b>				
≤3	177 (70.2)	62 (24.6)	13 (5.2)	$\chi^2 = 0.503$ p = 0.843
>3	17 (77.3)	4 (18.2)	1 (4.5)	
<b>ANC visits in pregnancy</b>				
≤ 3 Visits	57 (66.3)	21 (24.4)	8 (9.3)	$\chi^2 = 8.243$ p = 0.077
4 – 9 Visits	114 (70.4)	42 (25.9)	6 (3.7)	
≥ 10 Visits	23 (88.5)	3 (11.5)	0 (0.0)	

TABLE 6: SOCIO-ECONOMIC CHARACTERISTICS OF RESPONDENTS' SPOUSE AND RESPONDENTS PRACTICE OF ORAL HYGIENE

Variables	Practice			Test Statistics
	Good	Fair	Poor	
Frequency (%)				
<b>Level of education</b>				
Primary	2 (40.0)	1 (20.0)	2 (40.0)	Fisher's Exact = 23.770 p = 0.001*
Secondary	33 (60.0)	21 (38.2)	1 (1.8)	
Tertiary	142 (77.2)	33 (17.9)	9 (4.9)	
<b>Skill Level</b>				
<b>Skill level 1</b>	12 (66.7)	5 (27.7)	1 (5.6)	Fisher's Exact = 8.159 p = 0.188
Skill level 2	90 (66.2)	37 (27.2)	9 (6.6)	
Skill level 3	38 (82.6)	7 (15.2)	1 (2.2)	
<b>Skill level 4</b>	37 (84.1)	6 (13.6)	1 (2.3)	
<b>Monthly Income (₹)</b>				
< 18,000	6 (37.5)	8 (50.0)	2 (12.5)	Fisher's Exact = 23.803 p = 0.001*
18,000 – 60,000	42 (61.8)	20 (29.4)	6 (8.8)	
60,001 – 100,000	48 (72.7)	15 (22.7)	3 (4.5)	
> 100,000	81 (86.2)	12 (12.8)	1 (1.1)	

\*Statistically Significant

ment for improving oral hygiene. Yalcin et al reported that clinical index scores were related to the educational level of their study population. When the educational level of the study group decreased, the plaque, gingival index, and probing depth scores contrarily increased.<sup>22</sup>

Similarly, in an Australian study, women with high socio-economic index (SEI) were more likely to strongly agree that the practice of the use of dental floss would aid in the prevention of gum problems (p < 0.02). These findings could be attributed to the respondents' high

educational status. This similar positive association was also found with improved socio-economic status of respondents' spouses.<sup>17</sup> Therefore high socioeconomic status and educational level are important factors in determination of oral hygiene status of pregnant women.

Pain or gross dental caries could have a strong influence in the appropriate oral health seeking attitude. Lack of dental awareness is often the main reason for late presentation. In a study carried out in Calabar, majority (84.9%) of pregnant antenatal attendees wanted more training on oral hygiene and also wanted dental education to be part of antenatal counseling activity.<sup>23</sup>

This was similar to findings from an Indian<sup>11</sup> study with 61.5% of the subjects reporting never visiting a dentist and another study in Sudan<sup>19</sup> with results showing 42.3% had never visited a dentist. The recognition of regular dentist is an extension of positive attitude to oral hygiene by participants of both studies being composed mainly of respondents with tertiary level of education with better health care seeking attitude however their reluctance to practice this could be blamed on the poor knowledge of the importance of regular dentist visits as a necessity in optimal oral hygiene. The factors affecting oral hygiene practices in this study were similar to findings reported in other studies where occupational status, income and educational level were recognised to influence oral health.<sup>24,25</sup>

## CONCLUSION

Educational level of pregnant women, socioeconomic status and obstetric characteristics may significantly influence their oral hygiene practices. In conducting oral health education, these factors should be considered. Attendance at antenatal clinics offers an opportunity to educate pregnant women regarding oral health, provide preventive services and other treatment where appropriate.

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## CONFLICT OF INTEREST

Nil conflict of interest.

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