



Research Article

Dental Service Utilization, Oral Hygiene Practices, and Periodontal Treatment Needs of Pregnant Women in Nigeria

Soroye Modupeoluwa O.¹ and Bello Kamilu A²

¹Department of Preventive Dentistry, Faculty of Dentistry, University of Port Harcourt, Nigeria;

²Department of Restorative Dentistry, University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria

**Author for Correspondence:*

Soroye Modupeoluwa O

Email: docdupe@yahoo.com

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ABSTRACT

Objectives: To access pregnant women's oral hygiene practices, their use of dental services during pregnancy and their periodontal status.

Methods: A descriptive cross-sectional study. Multivariable logistic regression models were used to assess the associations between oral hygiene practice and dental service use during pregnancy. Data analysis was done using SPSS version. 20.0 and statistical significance was set at $p < 0.05$.

Results: One hundred and one pregnant women aged between 20 and 40 years participated in this study. Mean age was 29.73 ± 3.87 years. Majority were in the second trimester of pregnancy. About ninety-nine percent of participants brushed with toothbrushes and 63.4% used fluoride toothpaste. Three-tenth (29.7%) brushed twice daily. About half (45.5%) used medium bristled toothbrushes, and only 16.8% visited the Dentists during pregnancy. Reasons for non-attendance were lack of dental problems (83.3%), fear of dental instruments (8.3%) and treatments (3.6%), fear of pain (3.6%) and unpleasant past dental experience (1.2%). Clinical examination revealed that 45.4% had gingivitis. Almost 50% of those who said they had 1 or 2 dental problems had gingival bleeding. None of the participants had oral education before pregnancy. All had no knowledge of the relationship between oral health and pregnancy outcomes. About forty-four (44.6%) bled while brushing with gingival bleeding index of 1. Three-fifth had good oral hygiene. About 70% of participants who utilized dental services had CPI-Score of 0 as against 40% of those who did not.

Conclusion: There is the need to educate pregnant women about the need to utilize dental services particularly during pregnancy.

INTRODUCTION

The oral cavity as well as every organ of the body undergoes physical and psychological changes (hormonal, immunologic, dietary and behavioural) during pregnancy. Changes in the oral cavity associated with the periodontium (which comprises the alveolar bone, periodontal ligament, gingiva and the cementum) are well documented.[1-5] Likewise, the increased prevalence of oral mucosal lesions have been reported in pregnant than non-pregnant women.[6] Numerous studies have shown that periodontal infections such as maternal periodontitis not only affect the mother but may also affect the foetus, resulting in increased likelihood of adverse pregnancy outcomes like premature deliveries, preterm low birth weight (PLBW) and low birth weight infants.[7-10] Some intervention studies had documented that mechanical periodontal therapies such as scaling and root planing during the second trimester of pregnancy may reduce these risks.[11-15] Though, many countries have introduced specific activities and programs so as to improve the oral health of women, data from other parts of the world showed that the uptake of oral health services

during pregnancy ranges from 27% to 61%.[16-23] According to some studies, the percentage of dental clinic attendance during pregnancy in Nigeria is low.[24,25] Nigeria has no specific program or activity in place, though both the private and public sectors provide oral health care for the populace. Mothers attending the antenatal clinics of the Obstetrics and Gynaecology out-patient clinics of private Hospitals, State Government Hospitals and Federal Government Hospitals are not routinely referred to the dental clinics for oral health examination and oral health education. Thus, the majority of pregnant women do not make use of dental services during pregnancy.

The aim of this study was to assess pregnant women's oral hygiene practices, their use of dental services during pregnancy and their periodontal status.

METHODOLOGY

This is a cross-sectional study involving women who presented at the antenatal clinic of the Obstetrics and Gynaecology out-patient clinic of the University of Port Harcourt Teaching Hospital (UPTH), Port Harcourt between

July and August, 2017. Consecutive patients who consented were recruited into the study.

Data was collected with self - administered questionnaire which captured patient's age, educational level, age of gestation and parity, oral hygiene practices of the participants, dental attendance and reasons for utilization and non-utilization of dental services. The participants also rated their oral health. The authors then examined the participants to determine their oral health status and periodontal treatment need. The questionnaires were pretested and necessary adjustments made.

Ethical approval for the study was obtained from the Research and Ethics committee of UPTH.

Periodontal Examination

The oral hygiene and periodontal conditions were assessed using:

1. **Gingival Bleeding Index.[26]**

Bleeding was assessed by probing gently along the wall of soft tissue of the gingival sulcus. The following scores were recorded

0 = No bleeding on probing

1 = mild bleeding on probing

2 = moderate bleeding on probing

3 = spontaneous bleeding

2. **Simplified Oral Hygiene Index (OHI-S).[27]**

The OHI-S developed by (Greene and Vermillion,[27] is a composite index that scores debris and calculus deposition on selected teeth. It is expressed as the sum of the mean debris index (DI-S) and calculus index (CI-S) of the examined teeth. The OHI-S is interpreted as follows: Score 1 (good oral hygiene) = 0.0 – 1.2, Score 2 (fair oral hygiene) = 1.3 – 3.0, Score 3 (poor oral hygiene) = 3.1 – 6.0

3.

3. The Community Periodontal index of treatment needs (CPITN).[28] The Community Periodontal Index of Treatment Needs (CPITN) discovered by Ainamo,[28] is an epidemiologic tool developed by the World Health Organization (WHO) for the evaluation of periodontal disease in population surveys, throughout the world. It allows rapid examination of population groups to determine their periodontal treatment needs. The CPITN is primarily a screening procedure which requires clinical assessment for the presence or absence of periodontal pockets, calculus and gingiva. The mouth is divided into sextants defined by tooth numbers.

Scoring system

0 - Health i.e. no pocketing or gingival bleeding on probing.

1 - Gingival bleeding on probing.

2 - Supra\subgingival calculus present

3 - Pathological Pockets of 4-5mm (gingival margin on black area of probe.)

4 -Pathological Pockets $\geq$ 6mm (black area of probe no longer visible.) The individual's CPITN score is the maximum or worse score per sextant.

The Treatment Needs

Code 0 = No treatment required

Code 1 = Oral hygiene requires improvement

Code 2 = code 1 + Scaling and Polishing

Code 3 = code 2 + subgingival scaling and root planning

Code 4 = code 3 + complex periodontal treatment (Periodontal Surgery)

Data analysis was done using Statistic Package for Social Sciences version 20.0 (IBM SPSS statistics, Armonk New York). Descriptive analyses were done and statistical comparison was accomplished with chi-square test taking p-values < 0.05 to be statistically significant.

The formula for sample size for cross sectional study was used for this study.

$$n = \frac{z^2 pq}{d^2} = \frac{1.96^2 \times 0.10(1-0.10)}{0.05^2} = 3.84 \times 0.06(0.94) = 86.6$$

Where n is the sample size

Z = the statistic corresponding to level of confidence at 95% = 1.96

P = expected prevalence.[29]

D = precision of 5% at type I error of 5% = 0.05

Q = 1 - p

101 participants participated in this study

RESULTS

Table 1 shows the demographics of the participants. Participants aged between 20 and 40 years with mean age of 29.7 ± 3.87 years. Majority of the participants (61.4%) were in their second trimester of pregnancy.

Almost all participants brushed with toothbrushes and three- fifth (63.4%) brushed with fluoride containing toothpaste. About one third (29.7%) brushed twice daily. Over forty five percent used medium bristled toothbrushes. Table 2.

As regards dental clinic attendance, though two-fifth (39.6%) of the participants had visited the dentists in the past for dental treatments like extraction, restoration and scaling and polishing, only about 16% of them regularly visit the Dentist. Table 3

Table 1. Socio-demographics and obstetric profiles of the participants

Variables	Frequency	Percentage
Age Group (years)		
20-25	14	13.9
26-30	47	46.5
31-35	32	31.7
36-40	8	7.9
Ethnicity		
Yoruba	17	16.8
Igbo	32	31.7
Hausa	1	1.0
Others	51	50.5
Educational Level		
Primary	66	.0
Secondary	39	38.6
Tertiary	56	55.4
Period of gestation(weeks)		
0-13	12	11.9
14-26	62	61.4
>26	27	26.7
Parity		
1	29	28.7
2	48	47.5
>2	24	23.8
Total	101	100.0

Mean age = 29.73 ± 3.87 years

Reasons given by participants for non-regular attendance of the dental clinic varied. Four-fifth (83.3%) of the participants said lack of dental problems, 8.3% and 3.6% respectively fear of dental instrument and treatment, 3.6% fear of pain and 1.2% unpleasant past dental experience. Table 3

Table 2. Participants' practice of oral hygiene

Variables	Frequency	Percentage
Cleaning Item		
Toothbrush	100	99.9
Chewing Stick	1	0.1
Toothbrush Bristles		
Soft	9	8.8
Medium	46	45.6
Hard	46	45.6
Method of Brushing		
Horizontal (H)	3	3.0
Vertical (V)	10	9.9
H & V	88	87.1
Cleaning Material		
Fluoride containing Toothpaste	64	63.4
Herbal Toothpaste	37	36.6
Frequency of Brushing		
Once Daily	71	70.3
Twice Daily	30	29.7
Total	101	100.0

More than four-fifth (83.3%) of the participants thought they had no dental problems but clinical examination revealed that about half (45.4%) of them had gingivitis. Of the 11.9% who said they had 1 or 2 dental problems, almost half of them had gingival bleeding. The prevalence of pregnancy gingivitis among the participants was 44.6%.

None of the participants had oral education before pregnancy, all do not know of any relationship between poor oral hygiene and pregnancy outcomes. Table 4

Three-fifth (59.4%) of the participants had good oral hygiene. 60.4% had CPITN score of 1 and 2 and treatment need of 1 and 2. Table 5

Majority of the participants who utilized dental services were in their third and fourth decade of life and had tertiary education. Statistical analysis of education showed a statistical significance. Table 6

Crosstab of participants' dental service utilization and oral hygiene practices showed that almost all participants used toothbrush to clean their teeth. Though, more of those who utilized dental service used medium bristled toothbrushes, less of them used fluoride containing toothpaste when compared to those who did not access dental care. Equal number of participants who utilized dental care brushed once and twice daily. More participants who did not access dental care brushed once daily. Statistical analysis showed this to be significant. Table 7

More than half (54.5%) thought their oral health status was good. Ninety-five percent of those who regularly utilize dental services had no oral health problem. None of the

Table3. Participants' utilization of dental facilities

Variables	Frequency	Percentage
Have you ever visited the dental clinic		
Yes	40	39.6
No	61	60.4
Total	101	100.0
Reasons for attendance		
Check-up	2	5.0
Scaling and Polishing	19	47.5
Extraction	10	25.0
Restoration	8	20.0
Others	1	2.5
Total	40	100.0
Regular dental clinic attendance		
Yes	17	16.8
No	84	83.2
Total	101	100.0
Reasons for non-regular dental visit		
No problem	70	83.3
Fear of dental instrument	7	8.3
Fear of dental treatment	3	3.6
Fear of pain	3	3.6
Unpleasant past experience	1	1.2
Total	84	100.0

Table4. Participants' oral health profile

Variables	Frequency	Percentage
Self-reported oral health problems		
0	89	88.1
1	11	10.9
>2	1	1.0
Total	101	100.0
Type of health problems		
Gum bleeding	5	45.4
Bad tooth	3	27.3
Others	3	27.3
Total	11	100.0
Oral education before pregnancy		
No	101	100.0
Do you think there is a relationship between oral health and pregnancy outcomes		
No	101	100.0
Halitosis		
Yes	7	6.9
No	94	93.1
Bleeding while brushing		
Yes	45	44.6
No	56	55.4
Gingival Bleeding Index		
0	56	55.4
1	45	44.6
Total	101	100.0

participants who utilized dental services had halitosis as against 88.5% of those who don't. Table 8

Two-fifth of participants had gingival bleeding index of 1. More of those who did not access oral care. More participants (67.5%) who utilized dental services had CPI-Score of 0 as against 40% of those who did not.

Crosstab of participants' dental service utilization, oral hygiene and periodontal status showed that about two-third (59.4%) of the participants had good OHI-Status. 80% of those who accessed dental care as against 60% of those who did not. Statistical analysis showed a statistical significance. Table 9

Table5. Participants' oral hygiene status, periodontal status and periodontal treatment needs

Variables	Frequency	Percentage
Oral Health Status		
Good	60	59.4
Fair	30	29.7
Poor	11	10.9
Total	101	100.0
CPI-Score		
0	40	39.6
1	21	20.8
2	40	39.6
Total	101	100.0
CPI-Need		
1	40	39.6
2	21	20.8
3	40	39.6
Total	101	100.0

Table 6 Crosstab of participants' dental service utilization and some demographics

Variables	Dental Visit						χ^2	p
	Yes Freq	%	No Freq	%	Total Freq	%		
Age Group (years)							1.53	0.68
20-25	6	15.0	8	13.1	14	13.9		
26-30	20	50.0	27	44.3	47	46.5		
31-35	10	25.0	22	36.1	32	31.7		
36-40	4	10.0	46.6	8	7.9			
Education							37.0	<0.0001
No Formal	0	0.0	0	0.0	0	0.0		
Primary	0	0.0	6	9.8	6	5.9		
Secondary	3	7.5	36	59.0	39	38.6		
Tertiary	37	92.5	19	31.2	56	55.5		
Total	40	100.0	61	100.0	101	100.0		

Table7. Crosstab of participants' dental service utilization and oral hygiene practises

Variables	Dental Visit						χ^2	p
	Yes Freq	%	No Freq	%	Total Freq	%		
Cleaning Material							0.66	0.60
Toothbrush	40	100.0	60	98.4	100	99.0		
Chewing Stick	0	0.0	1	1.6	1	1.0		
Cleaning Item							1.23	0.26
Fluoridated Toothpaste	28	70.0	36	59.0	64	63.4		
Herbal Toothpaste	12	30.0	25	41.0	37	60.6		
Frequency of Cleaning							13.07	<0.0001
Once Daily	20	50.0	51	83.6	71	70.3		
Twice Daily	20	50.0	10	16.4	30	29.7		
Type of Brush Bristles							31.76	<0.0001
Soft	1	2.5	8	13.1	9	9.0		
Medium	32	80.0	14	23.0	46	45.5		
Hard	7	17.5	39	63.9	46	45.5		
Total	40	100.0	61	100.0	101	100.0		

Table8. Crosstab of participants' dental service utilization and oral health

Variables	Dental Visit						χ^2	P
	Yes Freq	%	No Freq	%	Total Freq	%		
Oral Health Problem							3.12	0.21
None	38	95.0	51	83.6	89	88.1		
1	2	5.0	9	14.8	11	10.9		
≥ 2	0	0.0	1	1.6	1	1.0		
Total	40	100.0	61	100.0	101	100.0		
Type of Oral Health Problem							0.90	0.64
Bleeding Gum	1	50.0	4	40.0	5	41.7		
Tooth Decay	1	50.0	4	40.0	5	41.7		
Others	0	0.0	2	20.0	2	16.6		
Total	2	100.0	10	100.0	12	100.0		
Self-rated Oral Health Status							6.95	0.03
Fair	11	27.5	33	54.1	44	43.5		
Good	28	70.0	27	44.3	55	54.5		
Very good	1	2.5	1	1.6	2	2.0		
Halitosis							4.93	0.03
Yes	0	0.0	7	11.5	7	6.9		
No	40	100.0	54	88.5	94	93.1		
Total	40	100.0	61	100.0	101	100.0		

Table9. Crosstab of participants' dental service utilization and oral hygiene and periodontal status

Variables	Dental Visit						χ^2	P
	Yes Freq	%	No Freq	%	Total Freq	%		
OHI-Status							12.33	<0.0001
Good	32	80.0	28	46.0	60	59.4		
Fair	7	17.5	23	37.7	30	29.7		
Poor	1	2.5	10	16.3	11	10.9		
Gingival Bleeding Index							19.62	<0.0001
0	33	82.5	23	37.7	56	55.5		
1	7	17.5	38	62.3	45	44.5		
CPI-Score							1.63	<0.0001
0	27	67.5	13	21.3	40	39.6		
1	5	12.5	16	26.2	21	20.8		
2	8	20.0	32	52.5	40	39.6		
CPI-Need							21.63	<0.0001
1	32	80.0	29	47.5	61	60.4		
2	8	20.0	32	52.5	40	39.6		
Total	40	100.0	61	100.0	101	100.0		

DISCUSSION

Though 40 (39.6%) of the participants visited the Dentist in the past, dental clinic attendance during pregnancy among this study group was 16.8%. This is comparable to the studies conducted in Eastern China and Edo State in Nigeria that recorded 16.7% and 19.8% respectively.[24,25] A study conducted in Lagos, Nigeria; recorded dental clinic attendance as 33%.[30] Worldwide the prevalence of dental service attendance during pregnancy ranges between 16 and 83%.[17,19,31,32]

One hundred and one pregnant women participated in this study. Their mean age was 29.7 ± 3.89 years comparable to other studies with mean age of 29.6 ± 7.0 and 29.5 ± 5.3 years respectively.[17,33] A Tanzania study reported a mean age of 25.7 years.[34] Two-third (61.4%) of the participants were in their second trimester of pregnancy.

Studies have shown that brushing twice daily using a toothbrush and fluoridated toothpaste help in the maintenance of good oral hygiene.[19-21] Almost all participants brushed their teeth with toothbrushes and three fifth (63.4%) brushed with fluoride containing toothpaste. All participants brushed once or twice daily and this is comparable to another study who recorded same.[34]

Oral hygiene instructions given to patients who attend dental clinics include the type of toothbrush to use, the frequency of tooth brushing, the use of interdental cleaning aids, the need to use fluoride containing toothpaste and the importance of visiting a dentist every six month. In this study, more participants who did not access dental care brushed once daily.

Interestingly, though more of those who utilized dental service used medium bristled toothbrushes which probably

reflected the oral hygiene instruction they had received during dental visits, however, some of them still used herbal toothpaste. What could be responsible for this despite the dental education they would have received during their visits to the clinics that encouraged the use of fluoride containing toothpastes? Could it be the fact that in Nigeria the choice of herbal toothpaste is more popular despite the attendant complications?[35]

Various reasons have been reported for poor utilization of dental facilities and they include perception of lack of dental problems, fear of dental instruments and treatments, fear of pain, bad past dental experience and high cost of dental treatments. In this study, reasons given for non-regular attendance of the dental clinic by participants were lack of dental problems, fear of dental instruments and treatments, fear of pain and bad past dental experience. Two-fifth of the participants visited the Dentists in the past for dental treatments like extraction, restoration and scaling and polishing; only 16.8% of them visited during pregnancy. The percentage of women who did not access dental services because they felt they had no oral problems was high in this study and is comparable to another study that recorded same.[36]

Periodontal treatment scores and need is used to assess the periodontal status. The participants' periodontal treatment need of those who accessed care was 1 which means they only need to be taught how to improve on their oral hygiene by emphasizing tooth brushing techniques. Scores 2 and 3 require the dentist doing some procedures in addition to giving oral hygiene education. This better result recorded among those who accessed dental care might have been as a result of the dental education they received at the dental clinic during their visits.

The prevalence of pregnancy gingivitis among the participants in this study done in South-South Nigeria was 44.5%. A study done in Lagos University Teaching Hospital in western Nigeria recorded a higher prevalence of 85.2%.[37]. Other studies done among pregnant women reported a range of 30% to 100% prevalence.[38-43]. In this study, the participants did not have oral education before pregnancy and have poor knowledge of the relationship between poor oral hygiene and adverse pregnancy outcomes. In conclusion, the use of dental services by women during pregnancy in this study is poor, and the need to educate all women about this cannot be over-emphasized considering the established relationship between poor oral hygiene and adverse pregnancy outcomes.

Conflict of interest: Nil

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