Knowledge, attitude towards and practice of oral hygiene among antenatal clinic attendees in public secondary health facilities in Benin City, Nigeria

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Abstract

Introduction: Oral hygiene involves the prevention of oral diseases which have been found to be common in pregnancy. Dental care in pregnancy aims at achieving healthy oral environment. This study assessed the knowledge, attitude towards and practice of oral hygiene among antenatal clinic attendees in public secondary health facilities in Benin City, Nigeria.

Methods: A descriptive cross-sectional study was conducted among antenatal clinic clients in the two state-owned secondary health facilities in Benin City. Respondents were selected using a two-staged sampling technique. A structured, interviewer-administered questionnaire was utilized for data collection. Data were analyzed using the Statistical Package for Scientific Solutions. Test statistics was done using chi-square test.

Results: The mean age of respondents was 29.3± 4.7 years, with 39.1% in the age group of 25-29 years. Majority of respondents, 228 (83.2%) were aware of oral hygiene. Also, 272 (99.3%) practiced tooth brushing while 43 (15.7%) used dental floss. Halitosis was identified as a form of poor oral hygiene by 177 (77.6%) of the respondents. More than half 54.4% of the women had poor knowledge of oral hygiene. The associations between their knowledge and attitude towards oral hygiene and the practice of oral hygiene were statistically significant ($p < 0.001$).

Conclusion: Though the respondents had poor knowledge of oral hygiene, there was a positive attitude and good practice of oral hygiene. There is a need for education on oral hygiene to antenal clinic attendees as a means of improving knowledge and preventing oral pathologies in pregnancy.

Key words: Oral hygiene, pregnant women, antenatal clinic, secondary health facilities

INTRODUCTION

Oral hygiene involves the prevention of oral diseases which have been found to be common in pregnant women. Dental care in pregnancy aims at achieving healthy oral environment through adequate plaque control by brushing, flossing and professional prophylaxis including scaling, root planing and polishing.[1,2] Periodontal disease and caries are highly prevalent in women of childbearing age and typically could remain asymptomatic for long periods of time. Advancing age, smoking, and diabetes are risk factors for the development of periodontal disease.[3]

There is a relationship between maternal periodontal disease and spontaneous preterm birth among pregnant women with moderate or severe periodontal disease.[4] The hormonal changes during pregnancy are associated with changes in the oral mucosa. Most of this changes are reversible clinically, however they can complicate pregnancy.[3]

Studies have shown that poor knowledge of oral health is associated with low socio-economic status and inadequate oral health seeking behaviour including poor personal preventive

practices.[5-8] There is a need for oral health promotion to routinely educate pregnant women about the importance of oral health and to promote an understanding of their ability to prevent common oral conditions.[9]

This study assessed the knowledge, attitude towards and practice of oral hygiene among antenatal clinic (ANC) attendees in public secondary health facilities in Benin City, Nigeria.

METHODS

The study was done in Benin City, the capital and largest city in Edo State, Nigeria with a population of 1,242,226. The city comprises mainly of 4 Local Government Areas: Oredo, Egor, Ovia North-East and Ikpoba Okha. Two state-owned secondary health facilities: Central Hospital Benin City and Stella Obasanjo Women and Children Hospital (SOWCH), with bed compliment of 500 and 300 respectively were used for the study. The healh facilities provide a range of clinical services including emergency care, promotive care, preventive care, curative as well as surgical care for the residents of Benin City and its environs.[10-13]

It was a descriptive cross-sectional study carried out between October 2014 and October 2015. The respondents were antenatal clinic attendees who gave verbal consent to participate in the study and were in a stable state of health.

The sample size, **n** was determined using Kish's formula[14] for simple proportion: $\mathbf{n = Z^2pq/d^2}$, where **d** = degree of 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}[6] and **q = 1- p**. With the addition of 10% non-response rate, a sample size of 274 was obtained and utilized for the study.

Two-staged sampling method was used to select participants from a representative sample, based on the average monthly antenatal clients. A total of 1420 and 1560 ANC attendees are seen monthly in Central Hospital and SOWCH. Using proportional allocation of respondents, 130 and 144 study participants were recruited from Central Hospital and SOWCH, respectively.

Stage 1: Simple random sampling method (balloting) was used to select three days each out of five days in a week used for antenatal clinics in the hospitals. For Central Hospital, approximately 71 clients are seen daily (355/week) while for SOWCH, 78 ANC clients are seen daily (390/week). After calculating the sampling fraction, an average of 27 respondents will be recruited on each selected clinic day in each of the hospital.

Stage 2: Systematic sampling method was used to select the respondents on each selected clinic day. A sampling interval of 3 was obtained. Before commencing questionnaire administration daily, a die was tossed to choose the first respondent, subsequently, every third respondent was recruited for the study, out of the daily clinic attendees. This was carried out over a period of 4 weeks till the required sample size was obtained.

A quantitative tool for data collection comprising of an interviewer-administered, structured questionnaire was utilized for this study. Questions in the questionnaire were used to score and assess knowledge, attitude towards and practice of oral hygiene.

All data were coded, entered and analysed using IBM SPSS version 21. A modified International Labour Organization, Standard Classification of Occupations (ISCO-08) was used to classify occupation into skill levels.[15]

Data were analyzed and expressed as frequencies, percentages and means $\pm$ standard deviation. Data were presented in the form of frequency and cross tables. For the assessments of

knowledge and practice, a percentage score of ≥ 70.0% was graded as good, 50.0 – 69.9% as fair and < 50.0% as poor. For attitude, percentage score of < 50.0% was assessed as negative attitude and that ≥ 50.0% was graded as positive attitude. The statistical test to determine associations between knowledge and attitude towards oral hygiene and the practice of oral hygiene were made with the use of the chi-square (χ^2) test. The level of significance set at $p < 0.05$.

Approval for the study was obtained from the Edo State Ministry of Health Ethics and Research Committee and the two hospitals used for the study. The purpose and procedure of the research was explained to the study participants and verbal informed consent was obtained from them respectively. Health education on the importance of oral hygiene in pregnancy was carried out after every interview.
A possible limitation of this study is that the information obtained from the respondents may have been prone to self-reporting bias, attempts were made to overcome this by asking the questions repeatedly in different forms. Further research could be done at the community level using a combination of quantitative and qualitative data collection methods to observe the oral hygiene practice of pregnant women.

RESULTS

A total of 274 respondents participated in this study. Majority of the respondents, 107 (39.1%) were in the age group of 25-29 years. The mean age of the participants was 29.2± 4.7 years. Over three-quarters, 224 (81.8%) were ever married. More than half, 167(61.0%) had tertiary level of education. Majority, 108(39.4%) were in skill level 2 occupational classification with less than a fifth, 49(17.9%) earning over ₦100000, monthly income. The respondents had an average of 1.5±1.3 children. Also, the mean number of pregnancies of the participants was 2.7±1.5. In addition, the average antenatal visitations of the respondents in the current pregnancy was 5.4±2.9 visits (Table 1).

Over three-quarters, 228 (83.2%) were aware of oral hygiene. School and media were the most reported sources of information on oral hygiene by 109(47.8%) respondents each. On respondents knowledge of oral hygiene, 192(84.2%) recognised tooth brushing while chewing xylitol gums was reported by 53 (23.2%) as components of oral hygiene. More than half of the respondents mentioned correctly the various signs of poor oral health status such as bad breath (77.6%), hole in tooth (55.3%), including gum pain (55.3%). Also, 149(54.4%) of the respondents had poor knowledge of oral hygiene (Table 2).

Majority of the respondents had a positive attitude towards oral hygiene, 240 (87.6%). Also, 208 (75.9%) and 218 (79.6%) of the respondents reported that they would see the dentist immediately for dental caries and tooth ache remedies respectively. The self reported oral hygiene status of the respondents was good, with 237(86.4%) of them reporting between good - excellent state of oral hygiene. About the same proportion, 236 (86.1%) revealed that they would need more training on oral hygiene during antenatal visits **(**Table 3).

More than two-thirds, 194 (70.8%) of respondents had a good practice of oral hygiene. Slightly over half, 147 (53.6%) of respondents brushed their teeth twice a day. Almost all the participants 272 (99.3%) used toothbrushes while a lower proportion 6 (2.2%) used either baking soda or table salt. Also, 201 (73.4%) of the respondents changed their toothbrushes within 1-3 months of use. Most 272 (99.3%) used brush with toothpaste to clean their teeth. Also, 203 (74.1%) revealed that they use toothpaste containing fluoride (Table 4).

The major reason reported by 165 (60.7%) of the respondents for brushing was to remove germs and bacteria. Other reasons mentioned include: prevention of mouth odour 66 (24.3%); clean teeth 31 (11.4%); and massage gum 10 (3.7%).

In addition, the respondents' knowledge and attitude towards oral hygiene and the reported practice of oral hygiene was statistically significant with $p < 0.001$ (Table 5).

Table 1: Socio-demographic and obstetrics characteristics of respondents

Variables	Frequency (n=274)	Percent (%)
Age group (years)*		
≤ 24	42	15.3
25-29	107	39.1
30-34	89	32.5
≥ 35	36	13.1
Marital status		
Ever married	224	81.8
Never married	50	18.2
Ethnicity		
Edo indigenes	207	75.5
Non-Edo indigenes	67	24.5
Level of Education		
Primary	10	3.6
Secondary	97	35.4
Tertiary	167	61.0
Occupational classification		
Skill Level 1	93	33.9
Skill Level 2	108	39.4
Skill Level 3	64	23.4
Skill Level 4	9	3.3
Monthly income (₦)		
≥ 18,000	66	24.1
18,001 – 60,000	118	43.1
60,001 – 100,000	41	15.0
> 100,000	49	17.9
Gravidity		
≤ 5	261	95.3
> 5	13	4.7
Parity		
≤ 3	252	92.0
> 3	22	8.0
ANC visits for current pregnancy		
≤ 3	86	31.4
4 – 9	162	59.1
>10	26	9.5

***Mean (sd) age = 29.2 ± 4.7 years; ANC = Antenatal Clinic**

Table 2: Respondents' knowledge of oral hygiene

Variable	Frequency (n=274)	Percent (%)
Awareness of oral hygiene		
Yes	228	83.2
No	46	16.8
Source of information	**(n=228)***	
School	109	47.8
Media	109	47.8
Health Facility	96	42.1
Friends	90	39.5
Family	70	30.7
Work place	2	0.9
Oral hygiene include	**(n=228)***	
Tooth brushing	192	84.2
Regular dental check-up	127	55.7
Using mouth wash	118	51.8
Flossing	84	36.8
Chewing xylitol gums	53	23.2
Signs of poor oral hygiene status	**(n=228)***	
Bad breath	177	77.6
Gum pain	126	55.3
Hole in tooth	126	55.3
Tooth ache	125	54.8
Gum bleeding	124	54.4
Tooth discolouration	124	54.4
Tooth loss	73	32.0
Causes of poor oral hygiene status	**(n=228)***	
Not brushing	168	73.7
Smoking	138	60.5
Eating sweets	126	55.3
Chewing tobacco	115	50.4
Not flossing	52	22.8
Level of knowledge		
Good	52	19.0
Fair	73	26.6
Poor	149	54.4

***Multiple responses**

Table 3: Respondents' attitude towards oral hygiene

Variable	Frequency (n=274)	Percent (%)
Attitude		
Negative	34	12.4
Positive	240	87.6
Dental caries remedy		
See dentist immediately	208	75.9
See dentist when it pains	33	12.0
Do not care	25	9.1
Take drugs	1	0.4
Rinse mouth with salt solution	1	0.4
Do nothing	6	2.2
Tooth ache remedy		
See the dentist immediately	218	79.6
Take drugs	30	10.9
Brush teeth more often	8	2.9
Chew herbs	2	0.7
Do nothing	16	5.8
Self reported oral hygiene status		
Excellent	97	35.4
Very good	70	25.5
Good	70	25.5
Average	26	9.5
Poor	3	1.1
Very poor	1	0.4
Do not know	7	2.6
Need more training on oral hygiene in ANC		
Yes	236	86.1
No	38	13.9

Table 4: Respondents' practice of oral hygiene

Variables	Frequency (n=274)	Percent (%)
Practice of oral hygiene		
Good	194	70.8
Fair	66	24.1
Poor	14	5.1
Frequency of teeth cleaning		
Once a week	3	1.1
2 – 6 times a week	9	3.3
Once a day	115	42.0
Twice or more a day	147	53.6
Teeth cleaning agents		
Tooth brush	272	99.3
Chew sticks	76	27.7
Tooth picks	52	19.0
Dental floss	43	15.7
Charcoal	21	7.7
Baking soda	5	1.8
Table salt	1	0.4
Time spent brushing (n = 272)		
< 2 minutes	28	10.3
2 minutes	63	23.2
3 minutes	75	27.5
> 3 minutes	106	39.0
Duration of brush change (n = 272)		
1 – 3 months	201	73.9
4 – 6 months	54	19.9
7 – 12 months	5	1.8
> 12 months	2	0.7
Do not know	10	3.7
Use of brush with toothpaste (n =274)		
Yes	272	99.3
No	2	0.7
Use toothpaste with fluoride (n =272)		
Yes	203	74.6
No	12	4.4
Do not know	57	21.0

Table 5: Knowledge and attitude towards oral hygiene and practice of oral hygiene among respondents

Variable	Practice			p-value
	Good(n=194)	Fair(n=66)	Poor(n=14)	
	Frequency (%)			
Knowledge				
Good	46 (88.5)	5 (9.6)	1(1.9)	p < 0.001*
Fair	60 (82.2)	11 (15.1)	2 (2.7)	
Poor	88 (59.1)	50 (33.6)	11 (7.4)	
Attitude				
Positive	182 (75.8)	51 (21.3)	7 (2.9)	p < 0.001*
Negative	12 (35.3)	15 (44.1)	7 (20.6)	

*Statistically significant

DISCUSSION

Most of the respondents were aware of oral hygiene. The media and schools were the most reported sources of information for oral hygiene reported by 47.8% of the respondents. This finding is similar to that obtained from an Indian study.[16] This could be because media are important means of disseminating information to a large audience. Information, communication and technology including social media networking are avenues that could be used as means of health education of the public on important health issues including importance of oral hygiene.

The high awareness of oral hygiene did not translate to high proportion of respondents with good knowledge of oral hygiene. Majority, 54.4% of the respondents had a poor knowledge of oral hygiene, which is in contrast to findings from studies done in Australia.[6, 17] The study reveals that all the respondents had formal level of education with majority having tertiary level of education. Also, the average female literacy of the study locale as reported by the National Demographic Health Survey, 2013 for Edo State was 84.1%, which was above the national average of 53.1%.[13] This shows a highly literate population which would likely seek health care in a health facility with skilled manpower.[18, 19] In addition, there are dentists and other specialist oral health service providers that are readily available in the two health facilities where the study was carried out. This study findings is in agreement with an earlier study done in Benin City, Nigeria[19] and Sudan.[20] This high literacy level of the respondents and the presence of oral health experts can be utilized to provide routine health education of women of child bearing age that access health facilities for various services on oral health hygiene and care.

The use of dental floss was recognized by slightly more than a third of the respondents in this study which is in contrast to those found in the same population group from a 2007 Australian study [17] where over three-quarters, 325 (84.0%) of the women understood that the use of dental floss would help prevent gum problems.[6] This may be because the use of floss is yet to find much popularity in our environment. Flossing is used to remove food particles or plaques lodged between teeth more efficiently than toothpicks. This helps to eliminate nidus for periodontal bacteria growth that may cause periodontitis and its sequelae. Use of dental floss could be encouraged in our setting by increased sensitization of the public on the advantages of its use and making it accessible and affordable to all that require it.

Majority of the respondents reported various practices and behaviours that could predispose to poor oral hygiene including poor tooth brushing, smoking, eating sweet confectionaries and chewing tobacco. This was similar to findings reported in studies of pregnant women carried out in India [21] and Pakistan.[18] This is commendable, though there is need for further enlightenment so that the level of knowledge of the causes of poor oral hygiene can be increased. The school, health facilities and the media which were recognized in this study as sources of information could be utilized for the purpose of educating the populace including pregnant women on oral hygiene benefits and the consequences of poor oral hygiene status.

Majority of the respondents had good attitude towards oral hygiene, as majority affirmed to go see a dentist immediately they felt pain or noticed hole in their teeth. In addition, over four-fifth of the pregnant women reported that they needed more training on oral hygiene in ANCs, a finding similar to that obtained in Calabar in 2009.[8] The inclusion of dental education during antenatal clinics would improve oral health practice of pregnant women and also could lead to better attitude towards and practice of oral hygiene in the family and the community at large. Since oral health is an important component of Primary Health Care, the Local Government Authorities can help promote and sustain community dental care in Nigeria.

Most of the respondents had good practice of oral hygiene, as more than half of them brushed their teeth twice or more a day contrasting a 2005 survey in China that found 32.0% of the 35-44 year-olds brushed at least twice a day.[22] It is also commendable that most of the respondents used tooth brush with toothpaste especially those containing fluoride. This would help reduce the incidence and prevalence of dental caries which is of public health importance especially in resource poor settings. This good practice would go a long way in mitigating oral pathologies among respondents in their pregnant state and its attendant risk.

Though a high proportion of the antenatal clinic attendees mentioned various methods of achieving good oral health status such as regular dental check-up, use of mouth wash and even use of dental floss, in practice their use was not reported by majority of the respondents. Tooth brushing with additional use of the above mentioned oral hygiene agents will help boost optimal oral health status. This in turn will reduce oral morbidities and their consequences.

Cumulatively, the knowledge and attitude towards oral hygiene significantly affected the practice as most of those with good and fair knowledge were more likely to have good practice and less poor practice of oral hygiene, similarly most respondents with good and fair practice of oral hygiene also had a positive attitude towards oral hygiene. This our study findings is in agreement with reports from earlier studies done on oral health. [23-25]

CONCLUSION

The study showed that majority of the respondents had poor knowledge of oral hygiene, despite the high awareness. The major sources of information on oral hygiene were from the media and school. Most of the pregnant women that had positive attitude towards oral hygiene also had good oral hygiene practices. The knowledge and attitude towards oral hygiene was associated with the practice of oral hygiene.

There is a need for oral hygiene education of pregnant women during antenatal clinics as a means of improving their knowledge and preventing oral pathologies in pregnancy and its consequences to the women.

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CONFLICT OF INTEREST
The researchers hereby declare that there is no conflict of interest in this study and its reported findings.

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