

Awareness of the Causes and Prevention of Dental Caries among Dental Outpatients in Central Hospital Benin City, Nigeria

*Elliot A. OKUNDIGIE, **Alphonsus R. ISARA

*Family Dentistry, Dental Centre, Central Hospital Benin City.

**Department of Community Health, University of Benin

ABSTRACT

Objective: To determine the awareness of the causes and prevention of dental caries among dental outpatients in Central Hospital, Benin City.

Methods: This study was a cross-sectional study carried out in Dental Centre of Central Hospital, Benin City. A total of 194 participants (18 years and above) attending the clinic during the four weeks study period participated in the study. An informed consent was obtained from the respondents following which a questionnaire was administered by a research assistant. Data was collected on their socio-demographic characteristics, awareness of dental caries and their causes and prevention.

Results: A total of 166 (85.6%) of the respondents reported awareness of dental caries. Those that were aware, their major (77.2%) source of information was human (relatives, friends and colleagues and so on). The majority (60.8%) thought that worm was the cause of dental caries and only 38.6% knew the actual cause of dental caries. The respondents that were aware of prevention of dental caries were 83.1% and 79.3% knew the correct method of preventing it.

Conclusion: The awareness about dental caries and its prevention was high but the awareness about the actual cause is low as many of the respondents still believed in the ancient theory that dental caries is caused by tooth worm.

Correspondence

Dr. E.A. Okundigie
Dental Centre
Central Hospital
Benin City, Edo State
Nigeria 300001
Email: okunselli@yahoo.com

Keywords: Awareness, Benin City, Central Hospital, Dental caries,

INTRODUCTION

Dental caries is a disease wherein bacterial processes damage hard tooth structure (Purkait, 1999; Bretz, 2002 and is one of the most common oral disease, worldwide. If dental caries is left untreated, it can lead to pain, tooth loss, infection and in severe cases death (Deroux, 2001). Archaeological evidence shows that tooth decay is an ancient disease dating far into prehistory and skulls dating to a million years ago through the Neolithic period show signs of caries, excepting those from the Paleolithic and Mesolithic ages (University of Illinois, 2011). The increase of caries during the Neolithic period may be attributed to the increased consumption of plant foods containing carbohydrates (Richards, 2002).

The bacteria namely *Streptococcus mutans*, *Lactobacillus acidophilus*, *Actinomyces viscosus*, *Nocardia spp* that exist in plaque convert sugar in the eaten food into acids, which dissolves minerals in the tooth and may result in cavity (Hardie, 1982; Suddick & Harris, 1990; Baehni & Guggenheim, 1996; Kleinberg, 2002). The presentation of caries is highly variable; initially it may appear as a small

chalky area, discolouration and may eventually develop into a cavity.

Citation: Okundigie EA, Isara AR (2019). Awareness of the causes and prevention of dental caries among dental outpatients in Central Hospital Benin City, Nigeria. *Nig J Res Orolfac Infect Oncol*; 2(1):9-14.

Dental caries may be directly visible; however other methods of detection such as radiographs are used for less visible areas of teeth and to judge the extent of destruction. In addition to the bacteria and their substrate, time is important for dental caries to develop; the length and frequency of time which the teeth are exposed to cariogenic environment affects the likelihood of caries developing.

Preventing dental caries can be achieved through adequate oral hygiene and this consists of regular professional cleaning, brushing at least twice a day and flossing at least daily. Dietary control to reduce sugary diet and minimize snacking is also vital. Worldwide, an estimated 90% of adults have experienced caries, with the disease being most prevalent in Asia and Latin

American countries and least prevalent in African countries but with increasing incident (Healthy People, 2010). The objective of the study was to determine the level of awareness of the causes and prevention of dental caries among dental outpatients in Central Hospital, Benin City.

MATERIALS AND METHODS

The cross-sectional study was carried out among adult dental patients in Central Hospital which is situated in Sapele Road in Central Benin area in Oredo Local Government Area of Edo State. A total of 194 patients were selected which exceeded the 163 minimum sample size calculated using the formula (Cochran, 1977). $n = Z^2pq / d^2$ Where n = the minimum sample size, Z = standard normal deviation, usually set at 1.96 corresponding to a 95% confidence level, p = target population estimated to be aware of causes and prevention of dental caries. (The prevalence (p) value was derived from a study done in Kenya to determine the dental caries experience and knowledge on the causes and preventive measures in an arid rural setting where 12% knew that bacteria was possible cause of dental caries (Owino, 2010), $q = 1 - p$ = the proportion of target population estimated not aware of causes and prevention of dental caries., d = degree of accuracy desired, usually set at 0.05. The total population of patients of 18 years and above attending the dental clinic of Central Hospital, Benin within the study period of four weeks was used for the study.

The data collection tool is an interviewer-administered questionnaire which elicited information on socio-demographic, worry and their health seeking behaviour when they have the condition. The data collection tools was pretested at the Dental Centre, Central Hospital, Auchi, Edo State which is a secondary health care facility with a similar characteristics as with the study population.

Ethical approval was obtained from Edo State Ministry of Health Ethics and Research Committee. Written informed consent was obtained from respondents

IBM SPSS version 20 was used for the analysis of data collected. The test of significance was used to find out whether the study result which was observed in the sample can be considered as a result which exists in the population from which the sample was drawn while chi-square was used to compare more than two groups in the study population. The level of significance was set at $p < 0.05$, with confidence level of 95%.

RESULTS

The mean age is 37.8 ± 1.5 years. More than half of the respondents were between 20-29 years (32.5%) and 30-39 years (22.2%). Male respondents (50.5%) were slightly higher than the female (49.5%) respondents. Most of the

respondents were either singles (42.3%) or married (50.0%) and 43.3% of the respondents were secondary school certificate holders and those without any education were low (6.2%). Majority (94.3%) of respondents are Christians (Table 1).

More than three-quarter (85.6%) of the respondents reported awareness of dental caries. The respondents between the ages 20-29 and 30-39 were more aware than other age group. The association between the age groups and respondents' awareness of dental caries was not statistically significant. Awareness among male respondents was more than that of female respondents. There was no statistically significant association between sex of the respondents and their awareness of dental caries. The respondents with tertiary education were more aware of dental caries than other respondents. Those respondents without any formal education had the least awareness. There was statistically significant association between the educational level of respondents and their awareness of dental caries (Table 2).

Majority (77.2%) of respondents knew about dental caries or tooth decay through human source such as relatives, friends, colleagues and so on. Those that heard through electronic media such as television, radio and internet were 9.6% while those that heard through reading of books were 10.8%. A very small proportion (2.4%) could not remember their source of information (Table 3). Majority (60.8%) of respondents think that dental caries is same as tooth affected by worm and only 37.4% of respondents think that dental caries means a hole in the tooth (Table 4). Majority (60.8%) of respondents believed that worm is the cause of dental caries or tooth decay (Table 5). Respondents that believe that maintaining good oral hygiene can prevent dental caries were 37.7% while 29.7% believed that it is a multiple approach method such as good oral hygiene, reduction in sugary food, and scaling and polishing (Table 6).

DISCUSSION

The male respondents (50.5%) were slightly higher than that of the female respondents (49.5%). This revealed that dental problems affect both male and female sexes almost equally. A higher proportion of the respondents were between the ages of 20-29 years (32.5%) and 30-39 years (22.5%). This showed that the middle-aged people attend clinic more than the old people. This is probably due to increased awareness of dental care in the recent times. In a similar study carried out in the Department of Conservative and Prosthetic Dentistry, University of Nairobi, Kenya, the ages of respondents were 18 years and above of which majority (41.1%) were between 18-24 years which is about the same for this study (Kassim et al., 2006).

Table 1: Socio-demographic characteristics of Respondents

Characteristics	Frequency (N= 194)	Percent
Age (years)		
10-19	14	7.2
20-29	63	32.5
30-39	43	22.2
40-49	26	13.4
50-59	23	11.9
≥60	25	12.9
Sex		
Male	98	50.5
Female	96	49.5
Marital status		
Single	82	42.3
Married	97	50.0
Divorced	9	4.6
Widow/Widower	6	3.1
Level of education		
None	12	6.2
Primary	37	19.1
Secondary	84	43.3
Tertiary	61	31.4
Religion		
Christianity	183	94.3
Muslim	11	5.7

Table 2: Association between age, sex, level of education and respondents' awareness of dental caries

Characteristics	Yes n (%)	No n (%)	P-value
Age (years)			0.474
10-19	13 (92.9)	1 (7.1)	
20-29	53 (84.1)	10 (15.9)	
30-39	40 (93.0)	3 (7.0)	
40-49	20 (76.9)	6 (23.1)	
50-59	19 (82.6)	4 (17.4)	
≥60	21 (84.0)	4 (16.0)	
Sex			0.197
Male	87 (88.8)	11 (11.2)	
Female	79 (82.3)	17 (17.7)	
Level of education			0.023
Non formal	7 (58.3)	5 (41.7)	
Primary	32 (86.5)	5 (13.5)	
Secondary	70 (83.3)	14 (16.7)	
Tertiary	57 (93.4)	4 (6.6)	
Total	166 (85.6)	28 (14.4)	

A higher proportion of the respondents were Christians (94.3%) and this could be attributed to the location of the study where majority of the respondents are Christians. The study revealed that 166 (85.6%) of respondents have heard of dental caries while 28 (14.4%) have not heard of the disease condition and among those that have heard,

the male and female proportion was about the same. This could be as a result of equal opportunity to information by both sexes in these modern days. This study therefore, showed that respondents' main source of information was human and this human source includes relatives, colleagues, friends, and so on. This

could be so because people rely more on information from other people instead of utilizing other sources and this could be responsible for the higher proportion of

wrong response by respondents on perceived knowledge of what is dental caries or tooth decay.

Table 3: Respondents' source of awareness about dental caries or tooth decay

Source of information	Frequency	Percent
Human source (Relatives, friends, colleagues etc)	128	77.2
Electronic media	16	9.6
Reading of books	18	10.8
Can't remember source	4	2.4
Total	166	100.0

Table 4: Respondents' perceived knowledge on what is dental caries or tooth decay

Knowledge	Frequency	Percent
Tooth affected by worm	101	60.8
Mobile tooth	1	0.6
Hole in the tooth	62	37.4
Dark or Black coloured tooth	2	1.2
Total	166	100.0

Table 5: Knowledge of respondents of the causes of dental caries or tooth decay

Knowledge	Frequency	Percent
Worm	101	60.8
Bacteria	13	7.8
Sugary food	31	18.7
Bacteria and Sugary food	20	12.1
Hereditary	1	0.6
Total	166	100.0

Table 6: Respondents' knowledge of methods of prevention of dental caries

Knowledge	Frequency	Percent
Remove worm	28	20.3
Maintain good oral hygiene by brushing twice daily	52	37.7
Reduce intake of sweet food	14	10.1
Scaling and polishing	3	2.2
Good oral hygiene, reduction in sweet food intake, scaling and polishing	41	29.7
Total	138	100.0

Majority (60.8%) of respondents believed that worm is the cause of dental caries or tooth decay. Respondents that believe that maintaining good oral hygiene can prevent dental caries were 37.7% while 29.7% believed that it is a multiple approach method such as good oral hygiene, reduction in sugary food, and scaling and polishing. Only 2.2% of the respondents believed that professional scaling and polishing alone can prevent dental caries.

A Sumerian text from 5000BC described a tooth worm as the cause of dental caries (ADA, 2012). The evidence of this belief has been found in India, Egypt, Japan and China. This belief was later unacceptable in the Islamic medical community from the 13th century onwards¹³. This belief was also discarded during the European medical community (Gerabek, 1999). Surprisingly, in these modern days, this study revealed that 60.8% of respondents which was more than half of the entire respondents believe that dental caries is caused by tooth

worm. This ancient belief is still being accepted in our environment because respondents' main source of information is human and these humans continue to pass this erroneous belief from one generation to another. Unfortunately, the modern source of information (television, radio, internet and journals et cetera) that could have erased this belief only account for 20.4% of respondents' source of information.

In this study, 7.8% and 18.7% of respondents believed that bacteria and sugary food (diet) were the causes of dental caries and this is in contrast to a similar study carried out in the Department of Conservative and Prosthetic Dentistry, University of Nairobi, Kenya where 12.0% and 36.0% of respondents believed that bacteria and diet respectively were the causes of dental caries (Kassim et al., 2006). This could be as a result of environmental factors such as stable electricity supply to access the internet and other electronic equipment, aggressive awareness campaign and better reading culture. The study showed that only 38.6% knew the actual causes of dental caries while the remaining 61.4% did not know the actual cause. This is due to the wrong information they have received over the years and this is further complicated by some traditional healers who claim they can extract worm from the tooth and that the worm is responsible for tooth decay (dental caries). Unfortunately, some of these traditional healers go on air to make this wrong claim and sometimes, establish a Trado-medical stand in markets or other open places to carry out this wrong practice (worm extraction).

This study further revealed that 83.1% of respondents knew that dental caries can be prevented while 16.9% believed that dental caries cannot be prevented. A similar study was also done in the Department of Conservative and Prosthetic Dentistry, University of Nairobi, Kenya where 50.0% knew that dental caries could be prevented (Kassim et al., 2006). This study therefore, showed that a higher proportion of respondents know that dental caries can be prevented than the study carried out in the University of Nairobi as stated above. This could be due to variation in awareness campaigns on prevention of dental caries in both study populations. However, this study revealed that out of the 83.1% of respondents that knew that dental caries could be prevented, 79.3% knew the correct method of prevention such as scaling and polishing, maintaining good oral hygiene by brushing twice daily with toothpastes containing fluoride and reduction in the intake a sugary food. This could be so because it is a common knowledge in our environment that to enjoy healthy teeth, one should brush twice daily and avoid sugary food and this can be supported by the very low proportion (2.2%) of respondents who knew that scaling and polishing is a correct method of prevention of dental caries.

CONCLUSION

The study revealed that 85.6% of respondents have heard of dental caries and their source of awareness is mainly through human source (colleagues, friends and relatives). Though the respondents' awareness was very high but their knowledge on causes of dental caries was very low (38.6%) since most of the respondents still believe in the ancient theory that tooth worm is the cause of dental caries. In this study 83.1% of respondents knew that dental caries could be prevented and 79.3% of this knew the correct method of prevention such as scaling and polishing, maintaining good oral hygiene by brushing twice daily with toothpastes that contain fluoride, and reducing intake of sugary food. A high proportion of the respondents knew the correct method of prevention of dental caries

REFERENCES

- Baehni PC, Guggenheim B (1996). Potential of diagnostic microbiology for treatment and prognosis of dental caries and periodontal diseases. *Crit Rev Oral Biol Med*; 7(3):259-277.
- Bretz W (2002). Oral profiles of bulimic women: diagnosis and management: what is the evidence? *J Evid Based Dent Pract*; 2(4):267-272.
- Cochran WG (1977). *Sampling Techniques*. 3rd ed. New York: John Wiley and Sons, Inc.
- Deroux E (2001). Complications of dental infections. *Rev Med Brux*; 22(4):A289-295.
- Gerabek WE (1999). The Tooth-worm: Historical aspect of a popular Medical Belief. *Clin Oral Investing*; 3(1): 1-6.
- Hardie JM (1982). The microbiology of dental caries. *Dent Update*; 9(4):199-200, 202-4, 206-8.
- Healthy People: 2010
[http://www.healthypeople.gov/Document/HTML/Volume2/21 Oral.htm](http://www.healthypeople.gov/Document/HTML/Volume2/21%20Oral.htm). (Accessed 5th of September, 2011).
- History of Dentistry: Ancient origins (<http://www.ada.org/>) website. Hosted on the American Dental Association. (Accessed 12th September, 2011).
- Kassim BA, Noor MA, Chindia ML (2006). Dental caries experience and knowledge among mothers attending reproductive and child health clinics, Kinondoni, Tanzania. *East Afr Med J*; 83(2):100-105.
- Kleinberg I (2002). A mixed bacteria ecological approach to understanding the role of the oral bacteria in dental caries causation: an alternative to *Streptococcus mutans* and the specific-plaque hypothesis. *Crit Rev Oral Biol Med*; 13(2):108-125.
- Owino EA (2010). Knowledge, attitude and practices of prevention of dental caries among patients visiting the university of Nairobi dental hospital oral diagnosis clinic. BDS Dissertaion University of

Nairobi

Purkait SK (1999). Essentials of Oral Pathology. Medical Publishers(P) LTD. New Dehli. pp198-214

Richards MP (2002). A brief review of the archaeological evidence for Palaeolithic and Neolithic subsistence. Eur J Clin Nutr; 56(12):16

Suddick RP, Harris NO (1990). Historic perspective of oral

biology: a series Crit Rev Oral Biol Med; 1(2): 135-151.

University of Illinois at Chicago. Epidemiology of dental disease
(http://www.uic.edu/classes/osci/osci590/11_1Epidemiology.htm) (Accessed 10th of September 2011)