ORIGINAL ARTICLE

A Ehizele J Chiwuzie A Ofili

Authors' affiliations:

A Ehizele, Department of Periodontics, University of Benin Teaching Hospital, Ugbowo, Benin-City, Edo-State, Nigeria J Chiwuzie, A Ofili, Department of Community Health, School of Medicine, University of Benin, Benin-City, Nigeria

Correspondence to:

A Ehizele Department of Periodontics New Dental Complex University of Benin Teaching Hospital P.M.B. 1111 Ugbowo Benin-City Edo-State, Nigeria Tel.: +2348023205869 E-mail: deblosco@yahoo.co.uk

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Oral health knowledge, attitude and practices among Nigerian primary school teachers

Abstract: Background: A multi-disciplinary approach is needed for effective dental education of children. Teachers can be used as oral health educators but only if they have a good knowledge, attitude and practice of oral health. This study's main objective was to compare the oral health knowledge, attitude and practices of public and private primary school teachers and to determine the proportion of teachers presently involved with oral health education of school children. Method: The study was carried out on 320 private and 320 public school teachers in Benin-City, Nigeria, using self-administered questionnaire. Results: The result revealed that the teachers involved in this study generally had positive attitude to oral health. Many of the two groups of primary school teachers had poor oral health practices. Only 42.4% of the respondents have ever been to the dentist for routine dental checkup or treatment. About 87.6% of teachers still use potentially traumatic materials for interdental cleaning and 60% of teachers consume regularly various forms of refined sugar. Over 90% of the two groups of teachers are presently involved in teaching their pupils basic oral health education although they have a poor knowledge of the aetiology of the two most common oral diseases. The teachers' major source of oral health information is the dentist. Conclusion: Similar pattern of incomplete oral health knowledge, inappropriate oral practices but positive oral health attitude was observed among the two groups of the studied teachers. This observation suggests that the primary school teachers can serve as oral health educators after organized training to heighten their oral health knowledge and perfect their oral practices.

Key words: attitude; knowledge; oral health; practice; teacher

Introduction

Oral health is fundamental and is an essential part of general health and well-being (1). Through oral health, the overall health, education and development of children, families and community is enhanced (2) but the consequences of oral diseases include pain, difficulty in eating and speaking, poor school performance and poor self-esteem (3).

The prevalence of caries in Nigerian school children is as low as that of children in developed countries of central Europe and lower than the global standard according to WHO classification (4). The prevalence of caries in suburban Nigerian school children was 13.9% and the mean decayed-missing-filled-teeth was 0.14 (5). This value is still within acceptable limit but it may increase in the future because the dental visit behaviour of the

school children, which has always been infrequent, has not improved (5). Dental health education and caries prevention programmes are expected to minimize caries in this group of children (5). The caries decline observed in many developed countries was the result of public health measure coupled with changing living conditions, lifestyle, improved self oral care practices and better utilization of oral health care services (6).

Oral health services in Nigeria are available predominantly in secondary and tertiary health facilities in urban centres. The available services are more of curative services rather than preventive services. According to the Federal Ministry of Health in Nigeria, data collected from professional regulatory agencies in December 2007 showed that there are 2 571 dentists (0.19 of the 1000 population) and 1 517 dental technologist and therapists (0.11 of the 1000 population) registered in Nigeria (7). There are fewer therapists than technologists as the annual students' enrolment in Federal School of Dental Technology and Therapy showed a dental technologist to dental therapists ratio of 2.1:1 (7). The shortage of oral health manpower, limited access to dental health education and increasing prevalence of dental diseases in Nigeria justify the incorporation of non-dental professionals in preventive oral health services proposed by the World Health Organization (8).

Children's health outcomes result from a complex interaction of biological determinants with sociocultural, family and community variables (9) and so there is a need for a multi-disciplinary approach to achieve effective dental health education. The largest and the most important group that may be reached by health education is found in the school system (10). Therefore, primary school teachers form a very important group that can be used for health education. The teachers, by virtue of being trained persons and because of their proximity to the children, have a determining role in disseminating knowledge on oral health and hygiene (11). They are known to exert a considerable influence on their pupils and to an extent, on the larger community (12).

Effective organization of experiences is the function of the teacher and naturally this effective organization will depend on the teacher's own belief and experiences. Teachers can effectively inculcate habits by naturally guiding the process of acquiring good habits with a definite aim. Long term habits are formed when they are allowed to develop over time when the children are young through repeated reinforcement. This ability of teachers is of great importance in dental health education as most of the inappropriate or ineffective dental practices observed in adults are formed from childhood. Ideally, primary school teachers should be able to give basic oral health information about the value of good oral health, tooth and gingival care, proper oral hygiene, fluoride use, dietary advice and timely dental visits (13).

It has been ascertained that teachers traditionally have educated children about oral health and often participate in school-based prevention programmes (14–18). A key step in planning oral health promotion will be to conduct a situational analysis (19). This situational analysis will involve collection and analysis of information to gain more understanding on the teachers' level of knowledge about oral health, their practices, beliefs and misconceptions and their willingness to impact their knowledge on the primary school children. The information is crucial to the design, planning and implementation of any school-based oral health education programme and will serve as a platform, on which a well-tailored oral health education programme can be placed. This study's objective was to achieve all the above stated objectives and also to see if there is a significant difference in the way public and private primary schoolteachers approach oral health education.

The main difference observed in the two groups of teachers is generally in the wages and salaries. Public school teachers have more organized unions and earn better salaries. This contentment may invariably translate to increased job satisfaction and more commitment to duties. Also, there may be a form of uniformity in the public school teacher's pattern of teaching and choices of instructional materials as the public school curriculum is drawn up by a Central Education Board.

Health education curriculum development in Nigeria actually started with hygiene and sanitation as school subjects (20). In the present national health education curriculum developed by the Federal Ministry of Education, teachers are expected to carry out health education, which involves teaching children general hygiene including proper care of the teeth and also health observation like regular checking of the children's nails, hair, teeth and general personal hygiene.

Although the general objective of the study was to compare the oral health knowledge, attitudes and practices of the public and private primary school teachers, the specific objectives were to determine the awareness of the teachers of the inclusion of oral health education in the curriculum used for training teachers in the various Nigerian institutions where teachers are trained, to assess the proportion of the study population involved in oral health education of school children presently and to determine the public and private primary school teachers' present source of oral health knowledge.

Methods

Subjects

The comparative descriptive cross-sectional study was carried out in Oredo Local Government Area (LGA) of Edo-state, South-south region of Nigeria involving 320 public and 320 private primary school teachers.

Sampling technique

A systematic sampling technique was used to select the teachers. The total number of teachers and the total number of schools were obtained from the local government education authority. There were 120 registered public primary schools and 107 registered private schools in the LGA.

There were 1920 teachers in the public primary schools (an average of 16 teachers in each public primary school) and 1360 teachers in the private primary schools (an average of 13 teach-

ers in each private primary school). Based on the expected sample size and the number of schools in each group, sampling interval of six and four was used to select 20 public and 25 private primary schools respectively. A starting point was obtained from a table of random numbers. All the teachers in the selected schools who met the inclusion criteria were used. Non-teaching support members of staff, teachers less than 18 years of age and teachers with less than 1 year teaching experience were excluded.

Instrument

A quantitative data collection method using pretested, selfadministered questionnaire was employed. The questionnaire was pretested using 20 teachers from both public and private primary schools in another LGA in the same state with similar characteristics with the study population. The 40-item questionnaire was divided into four parts: part one elicited information on demographic data, part two tested knowledge of oral health, part three tested oral health practices and part four tested attitude to oral health education. The questions were both open and closed ended types. The options for closed ended questions were obtained from relevant literature and an option of 'others (please specify)' was included to enable the respondents to freely decide on a response. Some closed questions required dichotomous yes or no responses.

To test for knowledge, respondents were asked the aetiological factors for tooth decay and gingival bleeding, which are considered common oral conditions. Oral health practice was tested by questions on previous dental visit, flossing, material used for interdental cleaning and frequency of consumption of cariogenic substances. Two questions were used to assess the rate of consumption of cariogenic substances. (1-do you eat sweets, chocolate or biscuit? and 2-do you use sugar in drinks or food?). The respondents were categorized as regular, irregular and non-users. Regular users gave positive response to the two questions, irregular users gave negative response to only one question and nonusers gave negative response to the two questions. Their attitude was tested by asking if they consider dental problem a serious health issue, if they consider dental treatment effective and if they expect deterioration in oral health with advancing age.

Ethical issues

Permission to carry out the study was obtained from all the selected school principals and administrators where ever applica-

ble. Informed consent was also obtained from the participating school teachers. Participants were assured of the confidentiality of their responses. The study was approved by University of Benin Teaching Hospital Ethics and Research Committee.

Data analysis

The statistical package for social sciences (SPSS) version 13.0 for Windows (SPSS Inc., Chicago, IL, USA) was used for the analysis of data collected. The analysis was done using frequency distribution, cross tabulation, test of significance with chi-square, level of significance P < 0.05. The results were presented using tables.

Results

The teachers generally exhibited positive attitude to oral health. About 75% of teachers (72.9% of private and 76.5% of public primary school teachers) consider dental problem a serious problem and 76.9% (73.2% of private and 80.6% of public primary school teachers) feel that dental treatments can prevent tooth loss. On the other hand, fewer teachers i.e. 41.8%(41.6% of private and 41.9% of public primary school teachers) still think it is natural to lose teeth with advancing age and only 45.6% (47.1% of private and 44.2% of public primary school teachers) think they will be able to keep all their teeth throughout life (Table 1).

Many of the two groups of primary school teachers had inappropriate oral health practices. Only 42.4% of the respondents have ever been to the dentist for a routine dental checkup or treatment. The use of potentially traumatic materials, other than the recommended toothpicks and dental floss, to remove impacted food particles from the teeth was considered poor practice. Only 8.5% of teachers (7.7% of private and 9.4% of public school teachers) use the usually recommended dental floss whereas 84.7% of teachers still use potentially traumatic materials [Wooden toothpicks (35.6%), plastic toothpicks (25.2%), broomstick (20%) and pin (12.4%)] (Table 2).

Regular consumption of cariogenic substances (refined sugar) was rated poor practice. About 42.7% of teachers were regular consumers (48.7% of private and 36.8% of public primary school teachers), 31.0% were irregular consumers and 21.3% were non-consumer of cariogenic substances (Table 3).

Out of 89.4% of teachers (86.2% of private and 92.6% of public primary school teachers) who knew that tooth decay is not normal (Table 4), only 50.5% (54.5% of private and 46.4%

Table 1. Teachers' attitude to oral health

	Private (%)	Public (%)	Total (%)	χ^2	P-value
Teachers who consider tooth loss a serious problem	226/310 (72.9)	237/310 (76.5)	463/620 (74.7)	1.03	0.57
Teachers who consider tooth loss natural with age	129/310 (41.6)	130/310 (41.9)	259/620 (41.8)	0.01	0.94
Teachers who feel dental treatments can prevent tooth loss	227/310 (73.2)	250/310 (80.6)	477/620 (76.9)	4.81	0.03
Teachers who feel they will be able to keep all their teeth	146/310 (47.1)	137/310 (44.2)	283/620 (45.6)	0.53	0.47
throughout life					

Values in parenthesis are expressed in percentage (%).

Table 2. Oral health practice of the school teachers

	Private (%)	Public (%)	Total (%)	χ^2	P-value
Teachers who had previous dental visit	130/310 (41.9)	133/310 (42.9)	263/620 (42.4)	0.06	0.81
Teachers who brush at least twice daily	228/310 (73.5)	229/310 (73.9)	457/620 (73.7)	0.01	0.93
Teachers who pick teeth with injurious materials	260/310 (83.9)	265/310 (85.5)	525/620 (84.7)	0.31	0.58
Teachers who use dental floss	24/310 (7.7)	29/310 (9.4)	53/620 (8.5)	0.52	0.47

Values in parenthesis are expressed in percentage (%).

Table 3. Rate of consumption of cariogenic substances among the respondents

Frequency	Private (%)	Public (%)	Total (%)
Regular Irregular Non-user Non-response Total	151 (48.7) 93 (30) 46 (14.8) 20 (6.5) 310 (100.0)	114 (36.8) 99 (31.9) 86 (27.7) 11 (3.6) 310 (100.0)	265 (42.7) 192 (31.0) 132 (21.3) 31 (5.0) 620 (100)

Table 4. Respondents who consider dental decay normal

Is dental decay normal	Private (%)	Public (%)	Total (%)
Yes	28 (9)	11 (3.5)	39 (6.3)
No	267 (86.2)	287 (92.6)	554 (89.4)
No response Total	15 (4.8) 310 (100)	12 (3.9) 310 (100)	27 (4.3) 620 (100)

 $\chi^2 = 8.47, P = 0.015.$

of public primary school teachers) have a good knowledge of what causes it (Table 5). Also out of 86.7% of teachers (85.8% of private and 93.5% of public primary school teachers) who knew that gingival bleeding is not normal (Table 6), only 5.2% of the teachers know the aetiological factors (Table 7). The major source of oral health information for both private and public primary school teachers is the dentist (32.8%). This finding is closely followed by textbooks (30.7%) and 16.4% teacher got their information from formal training at the teachers' training college. Many primary school teachers (91.6%) were presently involved in oral health education but more public primary school teachers were involved. (89.4% of private and 93.9% of public primary school teachers) (Table 8). About 64.4% are aware of the inclusion of oral health education in the curriculum used for training teachers in the Nigerian teachers training institutions. (69% of private and 63.8% of public primary school teachers) (Table 9).

Table 5. Knowledge of causes of dental decay

	Private (%)	Public (%)	Total (%)
Good knowledge	169 (54.5)	144 (46.4)	313 (50.5)
Poor knowledge	99 (31.9)	142 (45.8)	241 (38.9)
No response	42 (13.1)	24 (7.7)	66 (10.6)
Total	310 (100)	310 (100)	620 (100)

 $\chi^2 = 14.58, P = 0.0006.$

Table 6. Respondents who consider gingival bleeding normal

Is bleeding gum normal	Private (%)	Public (%)	Total (%)
Yes	28 (9)	15 (4.8)	43 (6.9)
No	266 (85.8)	290 (93.5)	556 (86.7)
No response	16 (5.2)	5 (1.6)	21 (3.4)
Total	310 (100)	310 (100)	620 (100)

 $\chi^2 = 10.73, P = 0.0046.$

Table 7. Knowledge of causes of gingival bleeding

	Private (%)	Public (%)	Total (%)
Good knowledge	16 (5.2)	16 (5.2)	32 (5.2)
Poor knowledge	250 (80.6)	274 (88.4)	524 (84.5)
No response	44 (14.2)	20 (6.4)	64 (10.3)
Total	310 (100)	310 (100)	620 (100)

 $\chi^2 = 10.10, P = 0.0064.$

Table 8. Respondents involved with OHE of school children

Involvement with OHE	Private (%)	Public (%)	Total (%)
Yes	277 (89.4)	291 (93.9)	568 (91.6)
No	10 (3.2)	8 (2.6)	18 (2.9)
No response	23 (7.4)	11 (3.6)	34 (5.5)
Total	310 (100)	310 (100)	620 (100)

OHE, oral health education.

 $\chi^2 = 4.8, P = 0.09.$

Table 9. Respondents aware of the inclusion of OHE in the curriculum used for training teachers

Inclusion of OHE in curriculum	Private (%)	Public (%)	Total (%)
Yes	214 (69)	198 (63.8)	412 (64.4)
No	70 (22.6)	93 (30)	163 (25.3)
No response	26 (8.4)	19 (6.2)	45 (7.3)
Total	310 (100)	310 (100)	620 (100)

OHE, oral health education.

 $\chi^2 = 4.96, P = 0.08.$

Discussion

The positive attitude to oral health demonstrated by the teachers used for this study is in keeping with a similar study on school health (21) carried out in Benin-City, where all the

teachers demonstrated positive attitude. This result is however different from the findings of a study among primary school teachers in Lagos state, Nigeria (12), which documented negative attitude to oral health issues among majority of the studied teachers. The difference observed from the two different regions could be due to environmental and cultural factors, which can affect individual's attitude to health matters (22).

Modern dentistry has established that the use of dental floss and other interdental cleaners is an important part of dental hygiene and required daily to remove plaque and other particulate from between the teeth and under the gingival line (23, 24). The use of dental floss is therefore recommended by virtually all dental health practitioners. The percentage of teachers who use dental floss for cleaning is very small and it is smaller than the 35% previously reported (25). Majority of the teachers use potentially traumatic materials like wooden toothpicks, plastic toothpicks, broomstick and pin to remove impacted food from the interdental spaces.

Various schools of thought are divided on the recommended interval between dental check-ups. The frequency of dental visit should be determined specifically for each patient, and tailored to meet his or her needs, on the basis of an assessment of disease levels and risk of or from dental disease. Preventive annual dental visit is still considered a standard oral health practice. In this study, more than half of the teachers have never had routine dental checkup done before. This result was similar to the results gotten from a cross-sectional study of adults in Benin-City, Edo-State, Nigeria (26), where 71% visited the dentist because of presence of symptom. The non-existent health insurance, out of pocket expense for dental care, poor standard of living and the few available and inequitable distributed oral health facilities are contributory factors.

The teachers' inappropriate oral health practice reflected in this study may affect what they teach the children, as it is generally believed that an individual cannot give what he does not have. On the other hand, the finding may not have a negative effect as there are many people who teach good practices despite the fact that they still indulge in poor practices themselves. Studies have suggested that one can have the tendency to hold high standards for others while performing morally suspect behaviours oneself (27–29).

The result of this study showed a lack of knowledge of oral health. A great percentage of teachers know that dental caries and gingival bleeding are not normal but only few of them know the aetiological factors. The teachers gave a variety of wrong answers when asked about the causes of the two most frequent oral diseases. This result supports findings from another study (30), which suggests that teachers' knowledge about oral health and current methods of prevention is incomplete and is inaccurate in some instances. A study done in Iowa City (31) also revealed that teacher had deficiency in understanding the processes and reasons for periodontal diseases. The inaccurate knowledge may not be limited to only oral health. A previous study conducted in Benin-City to assess the knowledge of head teachers about school health programmes in general (21) revealed that none of the head teachers had adequate knowledge of school health programme.

The oral health team in Nigeria is made up of dentist, dental nurses/assistants, dental technologists and dental therapists. Dental therapists who are regulated by dental therapist board in Nigeria play an important role in promoting dental health as they are trained to carry out a range of dental procedures and provide oral health education on a one-to-one basis or in a group situation. In Nigeria, they have not been able to carry out these roles optimally because they are few and most of them work in the few available tertiary healthcare institutions. Most of the educational programmes targeted at groups are carried out by dentists and dental students in Nigeria. Based on the above, it is therefore not surprising that this study revealed that the teachers' major source of oral health information was the dentists. This finding is similar to findings of other studies, which documented dentist and dental office as the most frequent source of oral health information among teachers in Yichang, Hubei (32), Kuwait (33) and Belarus (34), northern Israel (35). When source of oral health information was investigated in a study among Saudi parents (36), it was also found that the most frequent source was the dentist. It can be deduced from the above that dentists and other oral health professionals are the most frequent source of oral health information among teachers in developing countries.

The national school curriculum sets out a clear and statutory entitlement of learning for all pupils through all levels of schooling. It determines the content of what will be taught and sets attainment targets for learning. It covers the area of general health education like how to keep the environment clean, balanced diet, body hygiene like good body bath, handwashing, regular hair and nail cut, cleaning of teeth with chewing stick or toothbrush and toothpaste. Oral health education is part of the primary school curriculum in many countries of the world (37-39). The training of Nigerian teachers is expected to have been based on this curriculum. The percentage of private and public primary school teachers who claimed to be presently involved in teaching of basic oral health education is quite high although fewer teachers are aware of the inclusion of oral health education in the curriculum used for their own training. This finding may be a result of the various other available sources of information like textbooks, dental clinic and neighbours previously reported among in-service and trainee teachers (33, 40).

The high involvement of teachers in oral health education reflected by this study is commendable and should be encouraged as contextualized oral health educational activities in the schools have been said to have positive effects on oral hygiene, gingival bleeding score, oral health behaviour and the level of information about oral health (41, 42). The recorded percentage of teachers involved in oral health education is higher than the 56% of the teachers who are in favour of oral health education in Saudi Arabia (43).

Teachers can be targeted for better oral education of children. When compared with mothers in a previous study, they were said to have a higher knowledge on oral health (33). The main challenge, however, will be how to ensure proper implementation of the existing guidelines and to evaluate effectiveness of the oral health education of the children. Presently, the central education board is responsible for the supervision of teaching content and methods in the primary schools in Nigeria. Involvement of dental professionals in the supervision of teachers in the area of oral health may be helpful and should be advocated.

Limitation

The data for the study relied heavily on the information received from the respondents and so there may be some degree of over estimation or under estimation especially as some respondents may believe that the result from the study may be used for their assessment for promotion by the school authority.

Conclusion

This study revealed similar pattern of incomplete oral health knowledge, inappropriate oral practices but favourable oral health attitude among the two groups of teachers studied. This study suggests that there is a need for an organized training of primary school teachers, by dental health professionals, to heighten their oral health knowledge and perfect their oral practices and ultimately make them better oral health educators.

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