EFFECT OF ORAL HEALTH EDUCATION ON MOTHERS' KNOWLEDGE FOR ORAL HEALTH CARE OF CHILDREN IN ENUGU, NIGERIA

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ABSTRACT

AIM: The study identified the effect of oral health education on mothers' knowledge for oral health care for children.

METHODS: This was a cross-sectional study of 408 mothers who brought their children for immunization at a tertiary health care centre in Enugu, Nigeria. The association between the mother's age, level of education, and good knowledge of oral health care for children was assessed. Data analysis was performed using SPSS version 17.0 (IBM, Chicago, IL, USA) and the effect of all significant factors was inferred at $p< 0.05$.

RESULTS: Only 167(36.0%) mothers had good knowledge on oral health care for children prior to oral health education. There was significant association between level of education ($p=0.01$) and mothers' knowledge of oral health care for children. Mothers with secondary level of education had good knowledge of oral health care for children. After the study intervention, the proportion of mothers with good knowledge of oral health care for children increased by 40.8% when compared with the baseline ($p<0.001$).

CONCLUSION: Oral health education significantly improved mothers' knowledge of oral health care for children.

KEY WORDS: oral health, children, knowledge, mothers

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INTRODUCTION

Oral health is defined as the status of oral and related tissues which enables an individual to eat, speak and socialize without active disease, discomfort or embarrassment and which contributes to the general wellbeing of the individual.[1] Oral diseases have a life course because oral health of an adult is influenced by oral health experiences in childhood and adolescence, with poor oral health in childhood resulting in poor oral health in adulthood.[2] To achieve this, others who are the immediate care givers in children need adequate knowledge on oral health. It is thus of importance to set the template for a good oral health in childhood. Prior studies have shown an association between mother's knowledge of the importance of primary dentition, level of education, socioeconomic status and measures taken to provide preventive dental care for children.[3,4] According to Suresh et al,[5] 73.8% Indian mothers have a good knowledge of the effect of diet and dietary practices on the teeth. However, only about a quarter each of the mothers had a good knowledge of the importance of oral hygiene practice and primary dentition. In a Brazilian study, 65.4% of the women had a poor knowledge of oral health care in children.[6] In Nigeria, 71% of mothers seen at an antenatal clinic believed that the primary teeth are important[4] while mothers who attended baby well clinic had poor knowledge of oral health in children.[7]

In south eastern Nigeria, there is a dearth of information on mothers' knowledge on oral health care of the primary dentition. Prior study in Enugu showed that prevalence of early childhood caries was high.[8] Hence, this study assessed the relationship between mother's age, level of education, and knowledge of oral health care of the primary dentition. In addition, the effect of oral health education on oral health knowledge of mothers four weeks after the education was assessed'

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MATERIAL AND METHODS

Study Area and Study Population

The study was conducted at the University of Nigeria Teaching Hospital (UNTH), Enugu State, Nigeria. Enugu State is one of the 36 states in Nigeria and is located in the south eastern part of the country. The population is about 3.3 million.[9] UNTH runs a routine immunization clinic for children aged I day to 15 months. The clinic is used by mothers of different socioeconomic status as routine immunization is provided mainly through the public health sector. The vaccines for routine immunization of children in Nigeria include BCG (Bacilli Calmette Guerin)—at birth or as soon as possible after birth., OPV (Oral Polio Vaccine)—at birth and at 6, 10, and 14 weeks of age, DPT (Diphtheria, pertusis, tetanus)—at 6, 10, and 14 weeks of age, Hepatitis B—at birth, 6 and 14 weeks, Measles—at 9 months of age, Yellow Fever—at 9 months of age, Vitamin A—at 9 months and 15 months of age[10]

The study population was all the mothers that brought their children for immunization against diphtheria, pertusis, tetanus—(DPT 1 and 2) at 6 and 10 weeks

Research Design

This was an uncontrolled before and after study. The dependent variables were age, level of education while the independent variable is having good knowledge on oral care of children.

Selection Criteria

Inclusion criteria: Mothers whose children were to receive DPT 1 or DPT 2 vaccination and gave consent to participate were included in the study. These mothers were chosen so that the 4 weeks follow up post intervention could be conducted. Usually, DPT 1, DPT 2 and DPT 3 are received at 4 weekly intervals (6, 10, 14 weeks respectively)

Exclusion criteria: Mothers who had mental illnesses (depression and psychiatric disorders) and health disorders that prevented them from giving adequate information were excluded from the study.

Sample Size Calculation

The sample size was calculated with formula by Araoye[11]: $N=t^2 \times p(1-p)/m^2$. A 10% non- respond rate was also accounted for. The minimum sample size required for the study was 427. This was approximated to 430.

Study Procedure

Ethical approval for the study was obtained from the University of Nigeria Health Research and Ethics Committee (IRB00002323). Permission for recruitment of study participants from the immunization clinic was sought from Institute of Child Health, UNTH, Enugu. Informed consent was obtained from the mothers.

All consecutive mothers who satisfied the inclusion criteria were selected for the study. Before commencement of immunization, study questionnaire was administered to the mothers by the study team after consent for study participation was obtained. The questionnaires were retrieved once completed and oral health education on child dental care was given to the mothers as a group in the clinic. The education was based on the oral health education curriculum pilot tested in Nigeria[12] which was adapted from the infant oral health care curriculum developed by American Academy of Paediatric dentistry.[13] It has sections on prevention of dental caries, use of fluoride containing tooth paste, diet, good hygiene practices and importance of primary teeth. The education lasted 10 minutes; questions from the mothers were answered.

Four weeks later, the immunization clinic was revisited. All previous study participants were given another questionnaire containing the same questions as the first one to assess the effect of the oral health education on their knowledge of oral health care of children. Assistance in filling the questionnaire was rendered to those who found it difficult to fill the questionnaire.

Description of Instrument

The questionnaire has three sections: The first section elicited information on socio-demographic profile of mother. Information collected included the age of mother and the level of education of the mother.

Level of education: This was classified illiterate: when the mother did not attend any formal school; primary when the mothers had primary and incomplete secondary education; secondary: when the participants completed the secondary education and/or incomplete post secondary education; tertiary: mothers with completed post secondary education.

The second section elicited information on the mother's knowledge on oral hygiene practices.

This included questions on if they clean the baby's mouth, what they use to clean the baby's mouth, when they will start tooth brushing for the child, if they will use fluoridated toothpaste and how often they should brush the child's teeth when they erupt. These questions were adapted from the questionnaire used in a prior study.[5]

The third section elicited information on knowledge of the importance of primary teeth. This included questions on the importance of the primary teeth for mastication, speech, aesthetic and maintenance of space for permanent teeth.

Pilot Study: This was done two weeks before the study. The questionnaire was administered to ten mothers in the immunization clinic who were not part of the study. This helped to modify the questions by making it simple for better understanding of the study participants.

Standardization of Field Workers

Two dentists were recruited as field workers and trained on the data collection procedure and details of the study collection tool.

Data Handling

Aside from bio-data, any correct answer was scored 1 while wrong answer was scored 0. The total score of answers ranged from 0 to15. Good knowledge was taken to be a cut off of 12 points or above (an average of 80% and above) while poor knowledge was taken to be below 12 points (below 80%) adapted from a prior study.[14]

Data analysis

Statistical Package of Social Science (SPSS) version 17 was used for analysis. Exploratory analysis was conducted to ensure data consistency. Results were expressed using frequency tables and percentages. Descriptive analysis was conducted using mean and standard deviation. Bivariate analysis was conducted to test the association between the mother's age, educational level, occupation and knowledge of oral health care for children. The level of statistical significance was inferred at $p<0.05$.

RESULTS

Four hundred and eight mothers participated in the study. The age of the study participants ranged from 15 to 52 years. The mean age was 28.04±5.28 years.

Table 1 highlights the general characteristics of the study participants. Most of the participants (66.2%) were aged 21-30 years and had secondary education (48.0%). Only 167 (36.0%) had good knowledge of oral health care of their children.

Table 2 shows study participants' response to question on knowledge/oral hygiene practices in respect of primary dentition, feeding practices and importance of primary teeth of their children. Only 105 (25.7%) of the study participants knew the right time to start brushing their baby's teeth and 209 (51.2%) knew that night feeding can lead to tooth decay. Majority of study participants knew the importance of teeth: 334 (84.3%) identified that teeth were for chewing, 359 (88.0%) identified teeth were important for aesthetics, 355 (87.0%) identified teeth were important for speech, 338 (82.8%) identified teeth were important as space maintainers, and 346 (84.8%) identified that primary teeth need to be disease free throughout its life.

Table 3 highlights study participants' knowledge of oral health care of children by age, level of education before and after oral health education. There was no significant association between mother's age ($p=0.72$), and knowledge of oral health care for children before the oral health education was conducted. However, there was significant association between level of education ($p=0.01$) and mothers' knowledge on oral health care of children before oral health education. Most of the mothers with secondary level of education had good oral health knowledge when compared to the mothers with primary and tertiary level of education.

Also, there was no significant association between mother's age ($p=0.51$), level of education ($p=0.09$), and knowledge on oral health care for children after the oral health education was conducted.

Table 4 highlights study participants' knowledge before and after the oral health education on children's oral health care. Some mothers 46(26.8%) had good knowledge before the oral health education, while 104(73.2%) had good knowledge after oral health education. There was 40.8% increase in knowledge and this was statistically significant ($p<0.001$). However, 5(15.2%) mothers who had good oral health knowledge on children oral health care prior to oral health education had poor oral health knowledge after oral health education.

Table 1: General characteristics of the study participants (N=408)

Variables	Frequency N(%)
Age(years)	
=20	28(6.9)
21-30	270(66.2)
31-40	100(24.5)
=41	10(2.5)
Level of education	
Primary	51(12.5)
secondary	196(48.0)
Tertiary	161(39.4)
Knowledge of before oral care of children	
Good	147(36.0)
Poor	261(64.0)

Table 2: Distribution of study participants who answered correctly the questions on knowledge of oral hygiene practices, feeding practices and importance of primary teeth of their children (N=408).

Variables	Correct N(%)	Wrong N(%)
Oral hygiene practices		
Do you clean your baby's mouth	367(90.0)	41(10.0)
What do you use to clean your baby's mouth	304(74.5)	108(25.5)
When do you think that children should start tooth brushing?	105(25.7)	303(74.3)
Do you think that fluoridated toothpaste is important for children's teeth?	280(68.6)	128(31.4)
How often should children brush in a day?	232(56.9)	176(43.1)
Feeding practices		
Breast feeding is essential in the first 6 months of life	390(95.6)	18(4.4)
In a child with teeth, night feeding can lead to tooth decay	209(51.2)	196(48.8)
Sharing utensils, tasting the baby's food, kissing the baby can lead to transfer of bacteria that cause tooth decay from mother/care giver to the child	288(70.6)	110(29.4)
Juice, biscuits, sugar drinks, sweets can lead to tooth decay?	367(90.0)	41(10.0)
Snacking more than thrice a day can lead to tooth decay	303(74.3)	105(25.7)
Importance of primary teeth		
Important for chewing	344(84.3)	64(16.7)
Important for aesthetics	359(88.0)	49(12.0)
Important for speech	355(87.0)	53(13.0)
Serve as space maintainer	338(82.8)	70(17.2)
Should be disease free throughout life	346(84.8)	62(15.2)

Table 3: Study participants' knowledge of oral health care of children. (N=408)

Variables	Before oral health education				After oral health education			
Variables	good N=147 n(%)	poor N=261 n(%)	Total N=408 n(%)	P value	Good N=104 n(%)	Poor N=38 n(%)	Total N=142 n(%)	P value
Age(years)								
=20	11(7.5)	17(6.5)	28(6.9)	0.72	7(6.7)	3(7.9)	10(7.0)	0.51
21-30	99(67.3)	171(65.5)	270(66.2)		77(74.0)	27(71.1)	104(73.2)	
31-40	35(23.8)	65(24.9)	100(24.5)		17(16.3)	8(21.1)	25(17.6)	
=41	2(1.4)	8(3.1)	10(2.5)		3(2.9)	0(0.0)	3(2.1)	
Level of education				0.01				0.09
primary	22(15.0)	29(11.1)	51(12.5)		16(15.4)	2(5.3)	18(12.7)	
secondary	81(55.1)	115(44.1)	196(48.0)		53(51.0)	17(44.7)	70(49.3)	
tertiary	44(29.9)	117(44.8)	161(39.5)		35(33.7)	19(50.0)	54(38.0)	

Table 4 Study participants' knowledge before and after oral health education on children's oral health care (N=142)

Before		After	Total	McNemar P value
	n(%)	n(%)	n(%)	
	Good	Poor		<0.001
Good	41(39.4)	5(15.2)	46(32.4)	
Poor	63(60.6)	33(84.8)	96(67.6)	
Total	104(100.0)	38(100.0)	142(100.0)	

DISCUSSION

Before oral health education, less than half of the mothers had good knowledge on oral health care for their children and the level of education was significantly associated with mothers' knowledge of oral health care of their children. There was an increase in mothers' knowledge of oral health care of their children after oral health education.

Overall, mothers in this study had poor knowledge on oral health care for their children before oral health education. This is similar to prior studies in Nigeria,[11] India[15] and Brazil.[6] Knowledge of commencement of tooth brushing immediately the tooth appears was poor (25.7%) in this study and it is similar to the findings in India in which only 21.1% of mothers commenced tooth brushing of their babies immediately the tooth appeared.[16] However, the finding from this study was better than a prior study from Nigeria in which 90.7% mothers felt that children should start brushing between the ages of 2 and 6 years.[17]Early commencement of brushing enables the child get use to foreign object in the mouth and also enhance early exposure of the teeth to fluoride from the tooth paste and prevent dental caries.[18]Fluoride has been shown to be beneficial in preventing tooth decay and it is not detrimental to children.[19] Hence, when a child brushes at least twice a day, the child is exposed to fluoride which reduces the risk of tooth decay. However, in this study, less than seventy percent of the mothers believed that fluoridated tooth paste is important for children and just about half believed that brushing twice is important. This reflects the poor knowledge of these mothers in early preventive dental practices and calls for immediate attention.

In this study a lot of mothers believed that breastfeeding the child exclusively for the first six months was beneficial to the child but just about half of them knew that night and prolonged breast feeding in a child who has erupted teeth and with

poor oral hygiene practices can lead to dental caries in such baby. This is similar to a study conducted in Tanzania among mothers attending reproductive and child health clinic.[20] When food particles or breast milk are retained in the mouth after feeding at night, bacteria will act on them producing acid which will dissolve the dental hard tissues resulting in dental caries during the long hours of sleep. Hence, efforts should be made to clean the mouth after night feeding. Human milk has less minerals but more lactose than cow milk[21] which are fermented by cariogenic bacteria. Also, human milk has lower pH value than cow milk[22] and this will increase the risk of caries.

Streptococcus mutans is known bacteria associated with dental caries and can be transferred from mother to child by vertical transmission. Preventive behaviours for acquiring strep mutans will help to reduce caries occurrence.[23] In this study, many mothers believed that sharing utensils, kissing the child and tasting the child's food can transfer the bacteria from their mouth to their babies' predisposing the children to dental caries.

Snacking has been associated with dental caries.[8] Many of the mothers believed that refined sugars in the form of biscuits and sweets can lead to caries especially if they are consumed more than three times a day as seen in a prior study.[24] Refined sugar is one of the aetiological factors of caries and its consumption need to be controlled to prevent caries occurrence.

There was good knowledge of the importance of primary teeth for chewing, aesthetics, speech, space maintainer and keeping the teeth free from decay throughout its life. This is similar to prior studies in Nigeria[4,7] but contrary to the study in India.[5] This is a pointer that the mothers in this study will try to preserve these teeth and moreso when they are educated appropriately on the preventive measures to adopt.

In this study, the level of education of the mothers was associated with having adequate knowledge on oral health care for children. Mothers with secondary education had adequate knowledge more than the others prior to oral health education. This is contrary to the findings from previous study where mothers with tertiary education had adequate knowledge more than those with primary and secondary education .[24] it however collaborates the finding by Olusile[25] which found general low awareness of dental care and poor attitude towards dental health regardless of level of education. Again, the source of information for mothers with secondary level of education might be different from source of those with tertiary level of education. If an individual is not exposed to oral health education, the individual will likely have poor knowledge of oral health.

Oral health education of the mothers resulted in improved knowledge of mothers with poor knowledge. Mothers having good oral health care knowledge of their children will lead to favourable practices and ultimately result in little or no dental disease in the children.[26] The few mothers whose knowledge were initially good but later became poor after oral health education may be that they were not sure of the information they possessed indicating that repeated oral health education may be necessary for the study population.

[4]
It is recommended that mothers should be targeted at the immunization clinics to improve their knowledge on oral health care for their children. Other carers of children like nurses and paediatricians should be educated on oral health care for children to prevent the occurrence of dental diseases. Study to assess the source of information on oral health care of children by mothers in immunization clinics is recommended. This study however had the limitation of recruiting mothers only from a government hospital. Mothers attending private hospitals were not recruited. Also, the small number of mothers in follow up study might have affected the result. However, this study has given an insight to the level of oral health knowledge of mothers concerning their children in the study area.

CONCLUSION

Oral health knowledge of mothers was poor in the study environment prior to oral health education but improved after oral health education. Level of education was associated with mothers having adequate knowledge of oral health care of their children.

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