Assessing Oral Health Status of Children in An Urban Setting in Sub-Saharan Africa

hygiene status significantly had lower odds of having good oral hygiene (AOR: 0.154; CI: 0.____7; P=0.014) when compared to ___es.

Conclusion: ___ children had fair oral hygiene and ___ a risk indicator of oral hygiene st___ among children in this population.

INTRODUCTION

Oral hygiene practices help attain and maintain ___ and calculus free tooth surfaces ___ is an aetiological factor for dental c___ gingivitis, periodontitis and halitosis ___ can be reduced by effective toothb___ using dental cleaning aids. Children ___ brush more than o___ day have le___ ment in dental dis___ comp___ those who brush ___ less.[2] ___rara Uganda, th___ estab___ oral hygiene ___ status of the ___ ___geria, th___ ___oral self-___ ___fluoridated ___was low,[4] an___ ___a, older child___ ___status than ___ional oral pr___ ___removal of ___ ___mful to the ___ ___to the de___ ___al visit n___ ___ophylaxis ___acces ___nfor___ ___ch___

cleansing potential and at times, greater mechanical and chemical cleansing of oral tissue than the tooth brush.[16]

Meanwhile, the oral hygiene status of individuals may be influenced by the environment.[17,18] Children in urban areas have better access to dental care than children in rural areas who have limited or no access to the dental clinic due to the non-availability of dental clinics.[19] Prior studies conducted in Nigeria indicated that the oral hygiene status of children in a rural community in South east Nigeria was mainly fair,[17] while in the South West, it was poor.[18] The oral hygiene status of children in urban areas of Lagos was better than that of children in rural areas of Lagos.[20] Also, in urban areas of Abuja, many children had good oral hygiene.[13] In urban areas of Lagos, Ibadan and sub urban area of Nigeria, the oral hygiene status of most children was also fair.[9,13,21] There is, however, little known about the oral hygiene status of children in urban area of Enugu, SouthEast, Nigeria. Understanding the oral hygiene status of children in the urban areas will be a guide in planning oral health awareness program for children in the study population. This study, therefore, assessed oral hygiene status of children in Enugu metropolis and its association with age, sex, level of education, tooth brushing tool, frequency of tooth brushing, and dental visit.

MATERIALS AND METHODS

Study Setting and design

This was a secondary analysis of data. The primary study[22] recruited 657 children from primary schools in Enugu East Local Government Areas in Enugu in 2020. This work has been approved by University of Nigeria Teaching Hospital Research and Ethics committee and the study participants care givers gave informed consent to the work. The study was carried out in Enugu, Enugu State, South East, Nigeria.

The study population were children attending primary schools (public and private) in Enugu East Local Government Area in Enugu. Enugu East LGA is one of the three LGAs that make up Enugu metropolis. The total number of pupils in primary schools was 92,415 at the time of the study.[23] The criteria for selection of the children were provision of signed informed consent, giving

assent and being cooperative during the study. Oral hygiene status was assessed using the criteria by Greene and Vermillon.[24]

Determination of sample size

Sample size was determined using this formula by Aaroye[24] $N=t^2 x\, p\,(1-p)/m^2$. 'N' is the sample size while p is prevalence of good oral hygiene among rural primary school children (33.3%),[17] and 'm' is the margin of error at 5% standard value of 0.05, confidence level at 95% precision at the standard value of 1.96 is 't'. The minimum sample size was 335 although the data of 636 children were available.

Sampling technique

The sample was selected using multistage sampling technique. Ten primary schools (7 private and 3 public) were selected from Enugu East LGA. In each primary school, 66 children were recruited to have an even distribution of children using stratified sampling technique. From each of the six class levels, a class was selected by random sampling technique. Lastly, children picked a paper on which was written 'Yes' or 'No' from a ballot box, and those who picked 'yes' participated in the study.

Data handling

The age of the study participants was grouped into 5years to 8 years and 9 years to 12 years, and it was recorded as'1' and '2'respectively. Sex was recorded as '1' for male, '2' for female. Visit to dental clinic: '1' for 'Yes'; '2'for No. Using tooth brushing aid was recorded as '1' for chewing stick and '2' for toothbrush. Frequency of tooth brushing was grouped into once day, twice a day, and irregular recorded as '1', '2', '3'respectively.

Data analyses

The data were analyzed using Statistical Package of Social Science (SPSS) version 25 (IBM Corporation, Armonk, NY, USA). Descriptive analysis was conducted using a wide variety of measures of central tendency (mean) and dispersion (deviation). Results were presented using frequency tables. Association between age, sex, level of education, dental visit, tooth cleansing tools, frequency of tooth brushing and oral hygiene status was done. Multivariate logistic regression for potential determinants of oral hygiene status was

carried out. Fair and poor oral hygiene statuses were merged while good oral hygiene status was not merged in a model that was developed. Factors that showed significant association with good oral hygiene status were included in the model. P value < 0.05 was considered significant.

RESULTS

Six hundred and thirty-six children participated in the study. There were 307 (48.3%) males and 329 (51.7%) females. The age range was between 5 years to 12 years and the mean age was 8.21±1.90 years. Only 44 (6.9%) had visited the dental clinic in the past, 535 (84.1%) brushed once a day, and 490 (77.0%) of them used toothbrush and toothpaste. (Table 1)

Table 1: General characteristics of study participants (N=636)

Variables	Frequency n(%)
Age (years)	
5-8	371(58.3)
6-12	265(41.7)
Sex	
Male	307(48.3)
Female	329(51.7)
Visit to dental clinic	
Yes	44(6.9)
No	592(93.1)
Brushing frequency	
Once a day	535(84.1)
Twice a day	43(6.8)
Irregular	58(9.1)
Tools	
Chewing stick	146(23.1)
Toothbrush and toothpaste	490(77.0)
Oral hygiene status	
Good	16(2.5)
Fair	540(84.9)
Poor	80(12.6)
Total	636(100.0)

Figure 1 shows that most of the children had fair oral hygiene status 540 (84.9%), while few had good — 16 (2.5%), and poor oral hygiene — 80 (12.6%), sFigure 1: Oral
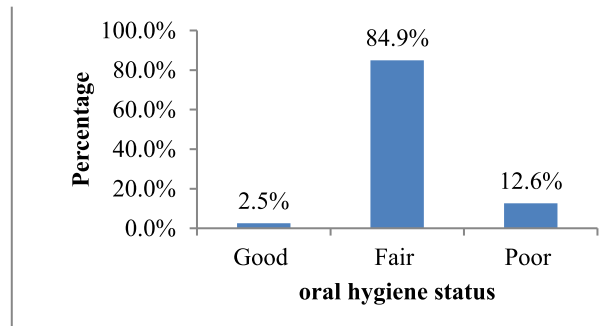
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Table 2 shows significant association between sex (p=0.001), brushing frequency (p=0.03), and oral hygiene status of children in Enugu metropolis. However, there was no significant association between age (p=0.37), visit to dental clinic (p=0.96), and tooth cleansing tools (p=0.07) and oral hygiene status of children in this study. Many females — 14 (87.5%) — had good oral hygiene while poor oral hygiene status was seen more in males: 48 (60.0%). tatus respectively.

Table 2: Association between age, sex, level of education, brushing frequency, cleansing tools, dental visit and oral hygiene status of children in Enugu metropolis (N=636)

Variables	Good n(%)	Fair n(%)	Poor n(%)	Total	P value
Age (years)					
5-8	12(75.0)	314(58.1)	45(56.3)	371(58.3)	0.37
9-12	4(25.0)	226(41.9)	35(43.8)	265(41.7)	
Sex					0.001
Male	2(12.5)	257(47.6)	48(60.0)	307(48.3)	
Female	14(87.5)	283(52.4)	32(40.0)	329(51.7)	
Visit to dental clinic					0.96
Yes	1(6.3)	38(7.0)	5(6.3)	44(6.9)	
No	15(93.8)	502(93.0)	75(93.8)	592(93.1)	
Brushing frequency					0.03
Once a day	11(68.8)	456(84.4)	68(85.0)	535(84.1)	
Twice or more than day	3(18.8)	39(7.2)	1(1.3)	43(6.8)	
Irregular	2(12.5)	45(8.3)	11(13.8)	58(9.1)	
Tooth cleansing tools					0.07
Chewing stick	2(12.5)	118(21.9)	26(32.5	146(23.0)	
Toothbrush and toothpaste	14(87.5)	422(78.1)	54(67.5)	490(77.0)	
Total	16(100.0)	540(100.0)	80(100.0)	636(100.0)	

Table 3 shows significantly lower odds of having good oral hygiene (AOR: 0.154; CI: 0.035-0.687; p=0.01) among males compared to females.

Table 3: Multivariate logistic regression analysis of factors associated with oral hygiene status of children in Enugu metropolis

Variables	AOR	95% CI	p value
Sex			
Male	0.154	0.035-0.687	0.01
Female	1		
Brushing frequency			
Once a day	0.559	0.119-2.625	0.461
Twice or more a day	1.683	0.263-10.776	0.583
Irregular	1		

DISCUSSION

In this study, most of the children had fair oral hygiene status. The association between sex, brushing frequency, and oral hygiene status of children in the study population was statistically significant. The risk indicator of good oral hygiene status among children in the study population was sex.

Sex was a potential determinant of good oral hygiene status in this study. More females than males had good oral hygiene status. This corroborates the findings from other studies.[9,13] Females pay attention to their oral health,[26] brush their teeth more frequently,[27] and are conscious of their appearance. A few studies, however, showed no association between sex and oral hygiene status.[28,29] Most of the children had fair oral hygiene similar to the finding in a previous study in a rural setting in the same State,[17] and urban areas of Lagos, Ibadan and sub urban area of Nigeria.[9,13,21] It was however

contrary to the findings in Abuja Nigeria[14] and Brazil, [8]where most (81.7%) of the children had good oral hygiene. This difference may be as a result of low practice of oral self-care among the children in Nigeria[4] when compared to children in Brazil.

Younger children had good oral hygiene when compared to older children in this study. This is similar to the findings in prior studies.[5,9] Caregivers usually supervise tooth brushing in children less than 8 years, resulting in better oral hygiene of younger children. Another reason may be pain from exfoliating and erupting teeth in mixed dentition which hinder effective brushing in older ones.[30]

A previous study showed that chewing stick has the same cleansing potential and at times greater mechanical and chemical cleansing of oral tissue than tooth brush.[31] However, this observation was not seen in this current study. Rather, those who used toothbrushes and paste had better oral hygiene than those who used chewing stick. The reason may be that the children may not know how to use chewing stick effectively.

Brushing twice or more a day was associated with good oral hygiene status although it was not a predictor as was seen in a previous study.[32] Children who brushed twice or more a day had good oral hygiene when compared to others. Brushing removes plaque which is the main aetiological agent of gingivitis and dental caries. Brushing twice especially last thing at night helps to maintain good oral health. There also was no significant association between age, cleansing tools, past dental visit and oral hygiene status of children. This is similar to a previous study in India[33], but contrary to the finding from a previous study conducted in Zimbabwe, which showed that students with good perceived status of teeth are more likely to have regular dental visit.[34]

A limitation of this study was that intra oral examination was conducted on the children while they were seated on their school chairs, instead of dental chairs. Also, being a school-based study, the findings may not be generalizable to the populace. However, the strength of the study is the large sample size.

CONCLUSION

Many children had fair oral hygiene, and sex was a potential determinant of their oral hygiene status. It is recommended that oral health promotion programmes should be targeted at children, especially the male children, for better oral hygiene outcome.

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Declaration of interest statement

The authors do not have any conflict of interest

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