Research Article

DMFT Index and OHI-S in Children Attending Public Schools in Abuja, Nigeria

Nathan U Ikimi[1]*, Funmilayo Jumoke Morebise[2], Alade Azeez[3], Busayo Immaculate Oludara[1], Olumide Alabi[1] and Wisdom Temitope Olatunbosun[1]

[1]*Dental Department, State House Clinic, Abuja, FCT Nigeria*

[2]*National Universities Commission, Abuja, FCT Nigeria*

[3]*Department of Oral Pathology, Radiology and Medicine, Iowa Institute of Oral Health Research, College of Dentistry, Unuversity of Iowa IA, USA*

*Corresponding Author: Nathan U Ikimi, Dental Department, State House Clinic, Abuja, FCT Nigeria.

Abstract

To examine the relationship between DMFT and OHI-S among children attending the Local Education Agency (LEA) schools in Gwarinpa, Abuja.

This is a descriptive cross-sectional survey of 270 pupils from the six primary Schools in Gwarinpa present at the 2019 National children's day celebration organized by a non-governmental organization (NGO), "Eat Right Society of Nigeria". Interviewer administered questionnaire was used to obtain socio-demographic data from the pupils and oral examination with children seated in an upright position under natural light was done by another NGO "Early 5years of Life International Initiative" (Abuja5). Collected data were tested statistically using SPSS software (ver.20.0; IBM, Chicago, IL, USA).

The study population is made up of 44.1% males and 55.9% females, between 4 - 20 years of age with mean age ($\pm$ SD) at 11.42 $\pm$ 2.6. Prevalence of tooth decay in children reported in this study was 11.9% with mean DMFT = 0.124 $\pm$ 0.5. Females had less tooth decay (11.3%) and statistical significantly better oral hygiene (70.2%) than males (47.9%).

There was no statistically significant difference between gender and DMFT; however, females had less decayed teeth with a significantly higher percentage of good oral hygiene compared to their male counterpart.

From this study, a clear relationship between DMFT and OHI-S exist among the pupils of six primary schools in Gwarinpa, Abuja. More oral health campaigns should be done to create oral health awareness among children. In addition, free oral health care for children should be prioritized by the Federal Government of Nigeria and implemented to local government level. School oral health visits by Dentist should be initiated by the Federal Ministry of health in collaboration with Non-governmental organizations.

Keywords: Awareness; DMFT; OHI-S

Introduction

A good oral health status could be defined to "include the ability to speak, smile, smell, taste, touch, chew, swallow and convey a range of emotions through facial expressions with confidence and without pain, discomfort and disease of the craniofacial complex" [1]. The general health of an individual is considered to be good based on certain indicators and a good oral health status is one of those indicators [2]. Thus, a good oral health in a child means that the child can eat, sleep, and develop better physically and psychologically into a healthy adult [3]. The absence of dental caries and periodontal diseases in a child are indications of a good oral health status of that child especially since these are the most frequently seen oral diseases known to affect several countries in dissimilar ways while also affecting people from diverse socio-economic background differently [4]. Nevertheless, it has been reported that dental caries and gingival infections affect close to 80% of school-

going age children, globally [5]. Unfortunately, there seems to be a steady unhindered increase in these dental infections especially in developing countries and some of the reasons attributed to the increase in poor oral health is lack of dental care in rural communities [6,7]; which also could be as a result of dentist/patients ratio, that is having few dentist attending to more patients in various rural communities [8,9]. Conflicting oral hygiene incidence has however been reported among children population living in the same neighbourhood despite the presence of dental clinics and this has been attributed to difference in socio-economic background of children [11] as well as the poor attitude of some parents to oral health issues concerning their children [10]. In addition to socio-economic factors, cultural barriers could also affect the oral health of children and adolescents despite being exposed to the same preventive strategy, thus emphasizing the need to include various ethnic community leaders in the planning of oral health policies [12].

Aim of the Study

The aim of this research is to find out if the oral health status of children attending public schools, in Gwarinpa, a satellite town in Abuja, north central Nigeria, has any relationship with dental caries present in these children. Information gathered at the end of this research could be used by Oral Health Policy makers to formulate effective preventive strategies for poor oral health and dental caries while taking the various socio-economic and diverse cultural background of the parents into consideration. It could also be used to compare the oral health and dental caries of children from other cultural background worldwide.

Methodology

This is a cross sectional descriptive survey of 270 pupils from the six primary Schools in Gwarinpa present at the 2019 National children's day celebration organized by a Non-Governmental Organization (NGO), "Eat Right Society of Nigeria". Oral examination with children siting in an upright position under natural light was done by another NGO "Early 5years of Life International Initiative" (Abuja5); free toothpaste was distributed after the examination. Ethical permission was obtained from the Research and Ethical Committee of the Federal Capital Territory (FCT) Abuja, Nigeria. Interviewer administered questionnaire was used to obtain socio-demographic data from the pupils. After discussing the criteria for examination, three calibrated examiners did oral examination on the pupils using disposable wooden spatula, hand gloves and face mask with pupil sitting in an upright position on a chair under natural light. The pupil's oral health status was evaluated using the World Health Organization (WHO) caries diagnostic criteria for Decayed, Missing and Filled Teeth for both primary and permanent dentition index (DMFT) [13] and Oral hygiene was assessed using the simplified OHI by Green and Vermilion (OHI-S) [14] where six selected surfaces on six index teeth are examined as stated below:

- In the posterior portion of the dentition, the first fully erupted tooth distal to the second bicuspid (15), usually the first molar (16) but sometimes the second (17) or third molar (18), is examined. The buccal surfaces of the selected upper molars and the lingual surfaces of the selected lower molars is examined.
- In the anterior portion of the mouth, the labial surfaces of the upper right (11) and the lower left central incisors (31) are given scores. In the absence of either of these anterior teeth, the central incisor (21 or 41 respectively) on the opposite side of the midline is substituted.

Criteria for classifying debris:

- 0: No debris or stain present.
- 1: Soft debris covering not more than one third of the tooth surface, or presence of extrinsic stains without other debris regardless of surface area covered.
- 2: Soft debris covering more than one third, but no more than two third, of the exposed tooth surface.
- 3: Soft debris covering more than two thirds of the exposed tooth surface (2).

Inclusions criteria included being a pupil from an identified primary school putting on the school uniforms, within the ages of 4 - 20, good general health, absence of tumours or any oro-facial anomalies and voluntary participation.

Excluded from the examination were children who were not wearing their primary school's uniform, those with any facial deformity or syndrome and pupils who were not willing to participate.

Statistical software was used for data entry of the data obtained (Microsoft Office Excel 2007 for Windows, Microsoft Corporation, Redmond, WA, USA) and all statistical tests were conducted using SPSS software (ver.20.0; IBM, Chicago, IL, USA).

Results

Variable	Frequency (n = 270)	Percentage
Gender		
Male	119	44.1
Female	151	55.9
Age group (Years)		
1 - 5	9	3.3
6 - 10	73	27.0
11 - 15	183	67.8
16 - 20	5	1.9
Mean ± SD	11.42 ± 2.6	
Ethnic group		
Hausa	164	60.7
Igbo	76	28.1
Yoruba	30	11.1

Table 1: Sociodemographic characteristics of subjects.

	Male	Female
Decayed teeth		
Present	15 (12.6)	17 (11.3)
Absent	104 (87.4)	238 (88.1)
Missing teeth		
Present	2 (1.7)	5 (3.3)
Absent	117 (98.3)	146 (96.7)

Table 2: Association between gender and DMFT status of subjects.

No significant between gender and decayed/missing teeth.

Variable	Frequency (n = 270)	Percentage
Decayed teeth		
Present	32	11.9
Absent	238	88.1
Missing teeth		
Present	7	2.6
Absent	263	97.4
Filled teeth		
Present	0	0
Absent	270	100.0

Table 3: DMFT status of subjects.

Mean decay score = 0.207 ± SD 0.7.
Mean missing score = 0.041 ± SD 0.3.
Mean DMFT = 0.124 ± 0.5.

	0 - 5	6 - 10	11 - 15	16 - 20
Decayed teeth				
Present	1 (11.1)	12 (16.4)	18 (9.8)	1 (20.0)
Absent	8 (88.9)	61 (83.6)	165 (90.2)	4 (80.0)
Missing teeth				
Present	0 (.0)	3 (4.1)	4 (2.2)	0 (0.0)
Absent	9 (100.0)	70 (95.9)	179 (97.8)	5 (100.0)

Table 4: Association between age group and DMFT status of subjects.

	Oral hygiene			
	Good (n = 163)	Fair (n = 79)	Poor (n = 28)	p-value
Gender				
Male	57 (47.9)	47 (39.5)	15 (12.6)	0.001*
Female	106 (70.2)	32 (21.2)	13 (8.6)	
Age group (Years)				
1 - 5	8 (88.9)	0 (0.0)	1 (11.1)	
6 - 10	48 (65.8)	21 (28.8)	4 (5.5)	0.207
11 - 15	103 (56.3)	57 (31.1)	23 (12.6)	
16 - 20	4 (80.0)	1 (20.0)	0 (0.0)	
Ethnic group				
Hausa	95 (57.9)	55 (33.5)	14 (8.5)	
Igbo	50 (65.8)	13 (17.1)	13 (17.1)	0.024*
Yoruba	18 (60.0)	11 (36.7)	1 (3.3)	

Table 5: Association between oral hygiene and socio demographic characteristics subjects.

Discussion

The study on the relationship between DMFT and OHI-S Index was done among 270 school children from primary schools present at the Children's Day celebration organized for the Children by the "Eat Right Society of Nigeria", a Non-Governmental Organization (NGO) interested in Healthy eating and the wellbeing of the entire family, in collaboration with "Early 5years of Life International Initiative", a different NGO interested in the health, especially oral health of Children and Mothers.

The study population was made up of 270 pupils consisting of 55.9% and 44.1% males; children between the ages of 11 - 15 made up 67.8%; the mean age (± SD) of the children was 11.42 ± 2.6. Hausa made up 60.7% of the study population and this is not unexpected since the study was conducted in north central Nigeria where Hausa is the dominate tribe.

The prevalence of tooth decay in children reported in this study (11.9%) is lower than the reported result among 12 years old school children in urban and rural areas of Zimbabwe [16] and also lower than the report (12.2%) of school children in rural southwest Nigeria [17]. While low access and utilisation of public and private dental centres due to cost could have been the reason for the results from Zimbabwe and Southwest Nigeria's [16-18] the children in this present study claimed that they had benefited from previous oral hygiene campaigns and free distribution of toothpaste and toothbrushes just like the one Eat Right Society of

Nigeria and Early 5years of Life International Initiative were doing for them, however they reported that no oral examinations were carried out. There was similar improvement in the oral health of Slovenian children when dental intervention such as increase supervision of tooth brushing with concentrated fluoride gels in schools and other preventive measures were implemented [19]. Nevertheless, tooth decay remains the major factor in DMFT of this study and this is in consonance with similar studies in rural Nigeria where decayed teeth were also in larger proportion compared to missing and filled teeth [20,21].

While females had slightly lower tooth decay than male in this study, there was no significant difference of DMFT recorded among gender. Still, a lower mean DMFT was noticed in this study (0.124) which agrees with a low DMFT recorded in a different study among 12 years old in Lagos, Nigeria [22]. Although there is an increase in prevalence of tooth decay and missing teeth reported among the 6 - 10 years, some studies indicated that the presence of dental caries in the primary dentition is a significant pointer for having caries in the mixed and permanent dentitions [23-25], however, the increase among 6 - 10 years old dropped in the group of 11 - 15 years old. Females in this present study had significantly better oral hygiene (p > 0.05) which agrees with previous studies in Lagos and Kosovo [22,26]. This could be as a result of females being more conscious of their appearance than their male counterparts. While cultural factors have been implicated as a dominant factor that influences OHI-S [27], the same conclusion cannot be made here from the significantly poor oral hygiene recorded among the Igbo ethic group in Nigeria, because the Igbo examined here are not a completely monogamous group and they are not in a predominate Igbo community.

Conclusion

This present study shows that a strong relationship exists between the DMFT index and the OHI-S among the children in public schools in Gwarinpa, Abuja north central Nigeria. This finding is in consonance with previous studies done in Nigeria and other parts of the world. Thus, efforts should be made to increase the frequency of oral health campaigns to primary schools and rural area with more participation of non-governmental organizations (NGO) to compliment government efforts. Free dental care should be made a priority for the government and programs for school oral health visits should be initiated. During such dental visits to primary schools, dental check-up should be done, healthy and regular consumption of fruits and meals that would build strong teeth should be encouraged. Furthermore, unhealthy regular consumption of large quantity of candies and soda should be discouraged while stressing the need for tooth-brushing at least, twice daily. The United Nations Children Funds could be used to fund part of oral health care for children in primary schools; especially primary schools in developing countries.

Researchers are encouraged to do further studies on the effect of culture on DMFT and OHI-S among children. This could lead to

using culture as a tool to encourage healthy eating and regular tooth-brushing among children.

Bibliography

1. FDI World Dental Federation. "A new definition of oral health". *International Dental Journal* 66 (2016): 322-324.

2. Imai S and Mansfield C. "Oral health relationship with general health and behavioral risk factors in North Carolina". *North Carolina Medical Journal* 76 (2015): 142-147.

3. Souza J., *et al.* "Impact of untreated dental caries on the daily activities of children". *Journal of Public Health Dentistry* 78.3 (2017): 197-202.

4. B Rai., *et al.* "Relationship Between Dental Caries and Oral Hygiene Status Of 8 To 12 Year Old School Children". *The Internet Journal of Epidemiology* 4.1 (2006).

5. Sharma A., *et al.* "Oral health status and treatment needs among primary school going children in Nagrota Bagwan block of Kangra, Himachal Pradesh". *Journal of Indian Society of Periodontology* 18.6 (2014): 762-766.

6. Okolo S., *et al.* "Oral hygiene and nutritional status of children aged 1-7 years in a rural community". *Ghana Medical Journal* 40 (2006): 22-25.

7. Akinyamoju CA., *et al.* "Dental caries and oral hygiene status: Survey of schoolchildren in rural communities, Southwest Nigeria". *Nigerian Postgraduate Medical Journal* 25 (2018): 239-245.

8. Sofola OO. "Implications of low oral health awareness in Nigeria". *Journal of the Nigeria Medical* 51 (2010): 131-133.

9. Maserejian NN., *et al.* "Rural and urban disparities in caries prevalence in children with unmet dental needs: The New England children's amalgam trial". *Journal of Public Health Dentistry* 68 (2008): 7-13.

10. Garbin Cléa Adas Saliba., *et al.* "Oral health education in school: parents' attitudes and prevalence of caries in children". *The Revista de Odontologia da UNESP* 44.5 (2015): 285-291.

11. White DA., *et al.* "Oral health habits amongst children in the United Kingdom in 2003". *British Dental Journal* 200 (2006): 487-491.

12. Lisa Bøge Christensen., *et al.* "Oral health in children and adolescents with different socio-cultural and socio-economic backgrounds". *Acta Odontologica Scandinavica* 68 (2010): 34-42.

13. World Health Organization. PAHO/WHO Oral Health survey Basic Methods (4th edition), World Health Organization, Geneva (1997).

14. Simplified Oral Hygiene Index | OHI-S - Oral Health Database, Malmö University (1964).

15. Okoye L and Ekwueme O. "Prevalence of dental caries in a Nigerian rural community: A preliminary local survey". *The Annals of Medical and Health Science Research* 1 (2011): 187-195.

16. Mafuvadze BT., *et al.* "Dental caries and oral health practice among 12 year old school children from low socio-economic status background in Zimbabwe". *Pan African Medical Journal* 14 (2013): 164.

17. Akinyamoju CA., *et al.* "Dental caries and oral hygiene status: Survey of schoolchildren in rural communities, Southwest Nigeria". *Nigerian Postgraduate Medical Journal* 225 (2018): 239-245.

18. Akhionbare O and Ojehanon PI. "The effect of dental facilities on the processes of tooth loss between urban and rural populations in Edo State Nigeria". *African Journal of Oral Health* 7 (2018): 21-28.

19. Vrbic V. "Reasons for the caries decline in Slovenia". *Community Dentistry and Oral Epidemiology* 28.2 (2000): 126-123.

20. Soroye MO and Adegbulugbe CI. "Oral health status, knowledge of dental caries aetiology and dental attendance: A comparison of school students in rural and urban areas of Lagos". *Port Harcourt Medical Journal* 10 (2016): 42-49.

21. Abiola AA., *et al.* "Dental caries occurrence and associated oral hygiene practices among rural and urban pre-school children". *Journal of Dentistry and Oral Hygiene* 1 (2009): 64-70.

22. Agbelusi GA and Jeboda SO. "Oral health status of 12-year-old Nigerian children". *West African Journal of Medicine* 25.3 (2006): 195-198.

23. El-Nadeef M., *et al.* "National survey of the oral health of 5-year-old children in the United Arab Emirates". *Eastern Mediterranean Health Journal* 16 (2010): 51-55.

24. Motohashi M., *et al.* "Employing dmft score as a risk predictor for caries development in the permanent teeth in Japanese primary school girls". *Journal of Oral Science* 48 (2006): 233-237.

25. Skeie MS., *et al.* "The relationship between caries in the primary dentition at 5 years of age and permanent dentition at 10 years of age - a longitudinal study". *International Journal of Paediatric Dentistry* 16 (2006): 152-160.

26. Shabani LF., *et al.* "The correlation between DMFT and OHI-S Index among 10-15-year-old children in Kosova". *Journal of Dental and Oral Health* 1.1 (2015): 1-5.

27. Tamimi Hal and Pani SC. "Dietary and Geographic and Cultural Factors as Predictors of Dental Caries Risk among Children in Saudi Arabia - A Systematic Review". *Primary Health Care* 5 (2015): 195.

Assets from publication with us

- Prompt Acknowledgement after receiving the article
- Thorough Double blinded peer review
- Rapid Publication
- Issue of Publication Certificate
- High visibility of your Published work

Website: www.actascientific.com/

Submit Article: www.actascientific.com/submission.php

Email us: editor@actascientific.com

Contact us: +91 9182824667