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DENTAL DISORDERS AMONG RESIDENTS OF UGBO-ODOGWU ESCARPMENT, UDI HILLS, EASTERN NIGERIA

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ABSTRACT

Oral epidemiological assessment of dental disorders was carried out between April and July 2006 among the residents of Ugbo-Odogwu escarpment on Udi Hill near Enugu, Eastern Nigeria. Dental abrasions with prevalence rate of 37.3 %, attrition (31.3 %), calculus (87.5 %), caries (78.8 %), gingivitis (62.6 %), gum recession (53.8 %), halitosis (82.7 %), periodontitis (52.6 %), stains (78.6 %) and teeth erosions (24.8 %) were the specific dental disorders observed in the area. Every subject had one form or the other of these oral conditions occurring concomitantly. Gender and age specific prevalence of dental disorders as well as nutritional habits, suspected to play major roles in the initiation and development of dental disorders in the study population were discussed. The result of this study could be used to develop a Management Information System (MIS) for Dental Health Care in Nigeria. It may also stimulate further research interests in the relationships between dental disorders and the nutritional habits of other communities in the developing world.

Keywords: Oral Epidemiology, Dental caries, Oral disorders, Eastern Nigeria

INTRODUCTION

Coal mining had attracted immigrants who encamped at several sites on Udi Hill escarpments near Enugu. Ikpeze (2005) reported that the encampments later metamorphosed into unregulated villages namely, Ugbo-Odogwu ($\approx 1.12 \text{ km}^2$), Agu-Abor ($\approx 0.76 \text{ km}^2$), Ugwu Aaron ($\approx 0.64 \text{ km}^2$) and Ugwu-Alfred ($\approx 0.7 \text{ km}^2$), which are generally regarded as semi-urban slums with inadequate social amenities and security. This author opined that parasitic infections and unsanitary conditions largely contributed to different health problems in the areas. Experience, from the Federal School of Dental Technology and Therapy Clinics Enugu, indicated that outpatients from these villages had almost entirely preventable oral problems, which sometimes necessitated expensive dental therapies.

Healthy teeth and gums are part of the general good health. The teeth are used for the mastication of foods and are essential for good nutrition, understandable speech and attractive facial appearance of the individual. There is a dearth of published information on dental diseases from this part of the country. The major aim of this study is to carry out an epidemiological assessment of dental disorders in Ugbo-Odogwu, where no previous data exist. The result of the study will provide useful epidemiological data for the development of a Management Information System (MIS) on Public Health; create dental health awareness and help to enhance compliance with community directed dental health education and counseling in the study area and elsewhere in the country. The result may also

stimulate further research interests on the relationship between dental disorders and nutritional habits of many communities in Nigeria.

MATERIALS AND METHODS

Study Area: The study area, Ugbo-Odogwu, situates on the Udi Escarpment via the Enugu-end of the Onitsha – Enugu Expressway (Figure 1).

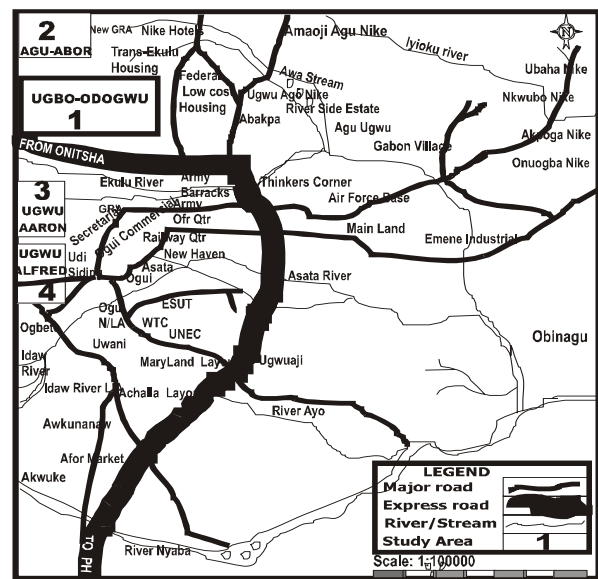


Figure 1: Map of Enugu town showing Ugbo-Odogwu (Ikpeze, 2005)

It has recently been integrated into Enugu-East Local Government Area. Ogbanokwute Spring, which serves as its only source of water, influenced the early migrant settlement in the area. However, Ekulu River, which traverses the Expressway, is a few kilometers from Ugbo-Odogwu. The population ($n \approx 10000$) is composed mainly of retired coal miners, railway artisans, peasant farmers and their wives. The active population included petty traders, commuter-bus operators, school children, trades apprentices, junior civil servants and touts who shuttle to Enugu for their daily businesses. There is the potential for rapid urbanization of Ugbo-Odogwu due to its proximity to the Expressway. Two Missionary Centres provide Primary school education. The nearest Secondary School is about 3 km away from the express road. The Federal School of Dental Technology and Therapy, Trans-Ekulu, which is a tertiary institution, is about 2 km away from the study area.

Awareness Mobilization: Information dissemination on the impending study was achieved through church announcements. The support of opinion leaders and landlords in the area was solicited. A female facilitator, recruited from the Ugbo-Odogwu accompanied the research team during the sensitization visits and throughout the study period. The community was thus adequately mobilized for the eventual study, which took place between April and July 2006.

Sample Population: Stratified random sampling technique was used to select the sample population of 80 individuals. It was primarily intended that equal numbers of each gender be used for the study. The researchers carried out personal interviews and clinical examinations of the oral cavities of the subjects to ascertain their dental health. The clinical signs studied included halitosis (bad breath), dental caries, tooth erosion, tooth stains, bleeding gums, calculus formation, gingivitis, gum recession, teeth abrasions, periodontitis and mobile tooth.

Data Collation and Analysis: Well-structured formats were used to record the subject's bio-data, dental disorders and nutritional habits. The results of analyses of epidemiological parameters were presented in the form of tables, histograms and descriptive assays. For tabular presentations, data were sorted, arranged, condensed and set out in such a way as to bring out the essential points. For histograms, the variables of interest were shown on the axis while the adjoining bars were drawn so that their areas represented the relative frequency of events studied.

RESULTS AND DISCUSSION

The study population was stratified under, gender, age groups, occupation and literacy levels (Table 1). Each age group provided 10.0 % subjects to the sample population of 80, comprising 39 (48.75 %) males and 41 (51.25 %) females.

Table 1: Stratification of the sample population of Ugbo-Odogwu (April-July 2006)

Age (years)	Male no.	Female no.	Total no. (%)
≤10	5	5	10 (10.0)
11-20	4	6	10 (10.0)
21-30	6	4	10 (10.0)
31-40	4	6	10 (10.0)
41-50	5	5	10 (10.0)
51-60	6	4	10 (10.0)
61-70	4	6	10 (10.0)
≥71	5	5	10 (10.0)
Total	31	41	80 (100.0)
Occupation			
Students	8	12	20 (25.0)
Civil servants	3	9	12 (15.0)
Petty traders	12	18	30 (37.5)
Farmers	8	2	10 (12.5)
Pensioners	8	0	8 (10.0)
Total	31	41	80 (100.0)
Educational level			
Primary	27	23	50 (62.5)
Secondary	6	14	20 (25.0)
Tertiary	5	2	7 (8.75)
Informal	1	2	3 (3.75)
Total	31	41	80 (100.0)

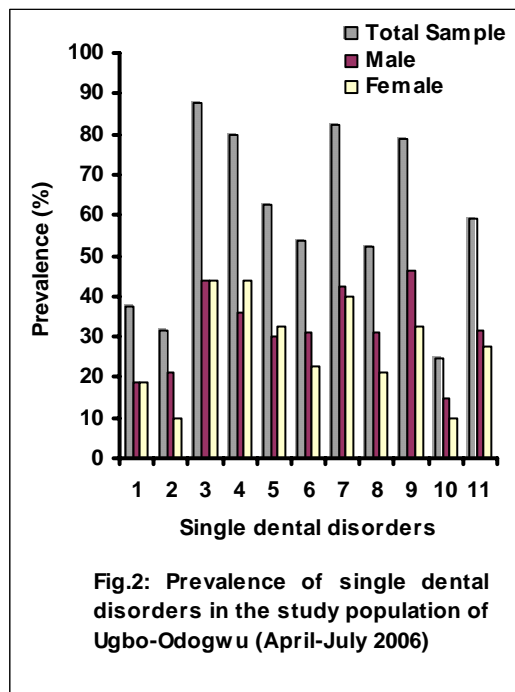
School children contributed 25.0 %, junior civil servants (15.0 %), petty traders (37.5 %), peasant farmers (12.5 %) and retired coal miners and railway artisans (10.0 %). Only 62.5 % of the study population obtained primary school education, 25.0 % (secondary education), 8.75 % (tertiary education), while the remaining 3.75 % did not have formal education. This result indicates that Ugbo-Odogwu residents are lower class citizens but literate enough to benefit from any coordinated community directed dental health education and counseling, to be complimented with the provision of appropriate social amenities and improved environmental sanitation.

10 specific dental disorders were observed in the area (Table 2). All the people examined were found to have one form of dental disorder or the other. Concomitant infections with 2 to 3 dental disorders were common in the community. The overall frequency of single dental disorders was 473 or 59.1 % prevalence rate, with a male: female ratio of 53.5: 46.5 (i.e. 1.15:1). The relative frequency of specific dental disorders was dental calculus 14.8 %, followed by halitosis (14.0 %), caries (13.5 %), and stains (13.3 %). Others were gingivitis (10.6 %), gum recession (9.1 %), periodontitis (8.9 %), abrasions (6.3 %), attrition (5.3 %), and teeth erosion (4.2 %). Males had higher prevalence of attrition (21.3 %), gum recession (31.2 %) periodontitis (31.2 %), stains (42.2 %) and teeth erosion (31.2 %) than females, with 9.9 %, 22.5 %, 21.2 %, 32.4 % and 9.9 % respectively (Figure 2). However, females had a higher prevalence of caries (43.7 %) than males (36.2 %). Generally, there were no marked gender differences in the prevalence of abrasions (18.7 – 18.8 %), calculus (43.7 – 43.8 %), gingivitis (29.9 – 32.5 %) and halitosis (39.9 – 42.5 %).

Table 2: Gender distribution and prevalence of dental disorders in the study population (n = 80) of Ugbo-Odogwu (April-July 2006)

Dental disorders	Total no.	Gender distribution		Population with dental disorders			*Prevalence		
		Male (M) no. (%)	Female (F) no. (%)	T (%)	M (%)	F (%)	T (%)	M (%)	F (%)
Specific dental disorders									
1. <i>Abrasions</i>	30	15 (50.0)	15 (50.0)	6.3	3.17	3.17	37.3	18.7	18.6
2. <i>Attrition</i>	25	17 (68.0)	8 (32.0)	5.3	3.59	1.69	31.3	21.3	9.9
3. <i>Calculus</i>	70	35 (50.0)	35 (50.0)	14.8	7.39	7.39	87.5	43.7	43.8
4. <i>Caries</i>	64	29 (45.3)	35 (54.7)	13.5	6.13	7.39	79.9	36.2	43.7
5. <i>Gingivitis</i>	50	24 (48.0)	26 (52.0)	10.6	5.07	5.48	62.4	29.9	32.5
6. <i>Gum recession</i>	43	25 (58.1)	18 (41.9)	9.1	5.28	3.80	53.7	31.2	22.5
7. <i>Halitosis</i>	66	34 (51.5)	32 (48.5)	14.0	7.18	6.76	82.4	42.5	39.9
8. <i>Periodontitis</i>	42	25 (59.2)	17 (40.8)	8.9	5.28	3.59	52.4	31.2	21.2
9. <i>Stains</i>	63	37 (58.7)	26 (41.3)	13.3	7.82	5.49	78.6	46.2	32.4
10. <i>Teeth erosion</i>	20	12 (60.0)	8 (40.0)	4.2	2.53	1.69	24.8	14.9	9.9
Cumulative Frequency	473	253 (53.5)	220 (46.5)	100	53.5	46.5	59.1	31.6	27.5
Multiple (concomitant) dental disorders									
1) <i>Abrasions with Halitosis</i>	12	7 (58.3)	5 (41.7)	3.2	1.85	1.35	14.9	8.7	6.2
2) <i>Abrasions with Periodontitis and Halitosis</i>	10	6 (60.0)	4 (40.0)	2.6	1.59	1.06	12.4	7.5	4.9
3) <i>Calculus with Attrition and Halitosis</i>	8	5 (62.5)	3 (37.5)	2.1	1.32	0.79	9.9	6.2	3.7
4) <i>Calculus with Erosions and Stains</i>	5	4 (80.0)	1 (20.0)	1.3	1.06	0.26	6.2	4.9	1.3
5) <i>Calculus with Halitosis</i>	40	25 (62.5)	15 (37.5)	10.6	6.63	3.97	49.9	31.2	18.7
6) <i>Calculus with Stains</i>	50	23 (46.0)	27 (54.0)	13.3	6.10	7.16	62.4	28.7	33.7
7) <i>Calculus with Stains, Gingivitis and Halitosis</i>	12	5 (41.7)	7 (58.3)	3.2	1.33	1.86	14.9	6.2	8.7
8) <i>Caries with Calculus</i>	60	28 (46.7)	32 (53.3)	15.9	7.42	8.48	74.9	34.9	40.0
9) <i>Caries with Calculus and Gum recession</i>	30	19 (63.3)	11 (36.7)	8.0	5.04	2.91	37.4	23.7	13.7
10) <i>Caries with Calculus and Halitosis</i>	45	20 (44.4)	25 (55.6)	11.9	5.30	6.63	56.2	24.9	31.3
11) <i>Caries with Calculus, Stains and Halitosis</i>	30	14 (46.7)	16 (53.3)	8.0	3.71	4.24	37.4	17.5	19.9
12) <i>Caries with Gingivitis</i>	30	5 (16.7)	25 (83.3)	8.0	1.33	6.63	37.4	6.2	31.2
13) <i>Caries with Periodontitis</i>	25	15 (60.0)	10 (40.0)	6.6	3.97	2.65	31.2	18.7	12.5
14) <i>Caries with Stains</i>	20	15 (75.0)	5 (25.0)	5.3	3.97	1.23	24.9	18.7	6.2
Cumulative Frequency	377	191 (50.7)	186 (49.3)	100	50.7	49.3	47.1	23.8	23.3

Prevalence = Relative frequency (%) x MF, where MF is the multiplying factor. [MF for specific dental disorders = (473/80) = 5.9125. MF for multiple dental disorders = (377/80) = 4.7



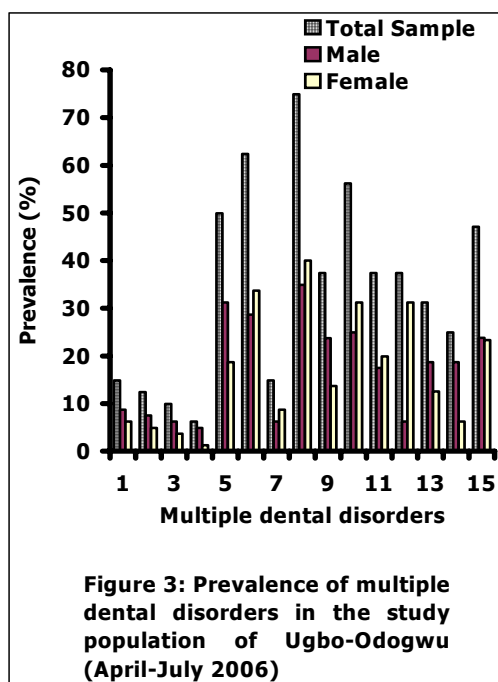
Barker and Less (1996) opined that tooth-tooth contact or input of foreign objects such as nails, pens, and pins and chewing of bones etc., in the mouth caused tooth abrasion. It is worth knowing that most young people in the study area took delight in opening bottles of beer and soft drinks with their

teeth, and not realizing the inherent harmful effects. Heymsfield *et al.* (1994) reported high prevalence of dental caries from Western Europe, North and South America, Japan and Australia. Shills *et al.* (1994) noted that while 65 % of North American population required dental treatment and about one out of every 20 persons needed to have at least one tooth extracted as a result of caries.

Overall frequency of multiple dental disorders was 377 or 47.1 % prevalence rate, with a male: female ratio of 50.7: 49.3 (i.e. 1.03:1). Caries with calculus was of most frequent occurrence (15.9 %), followed by calculus with stains (13.3 %), caries with calculus and halitosis (11.9 %), and calculus with halitosis (10.6 %). The staple foods in Nigeria, including Ugbo-Odogwu, contain high carbohydrate, and also encourage tooth-tooth contact. People need to keep their mouths clean after such meals to avoid infection that may lead to oral diseases.

There was higher prevalence of calculus with halitosis (31.2 %), caries with calculus and gum recession (23.7 %), and caries with stains (18.7 %) in males than in females with 18.7 %, 13.7 %, and 6.2 % respectively (Figure 3). However, females had higher prevalence of calculus with stains (33.7 %), caries with calculus (40.6 %), caries with calculus and halitosis (31.3 %) and caries with gingivitis (31.2 %) than males with 28.7 %, 34.9 %, 24.9 % and 6.2 % respectively.

Age-specific distribution of dental disorders is shown in Table 3. Abrasions, attrition, periodontitis and teeth erosions appeared to be rare in subjects



halitosis, abrasion with periodontitis and halitosis, calculus with attrition and halitosis, calculus with erosions and stains were rare and not observed in age groups less than 30 years old. Calculus with halitosis, calculus with stains, caries with halitosis, and caries with calculus and halitosis appeared to follow almost the same pattern and were widespread in the study population. Cumulative frequencies of specific and concomitant dental disorders (Figure 4) indicated that the conditions were generally age dependent. This was in line with the findings of Adegbebo (1995) who reported that the prevalence of caries increased from childhood to adulthood in Nigeria.

Gender and age distribution of subjects with peculiar nutritional habits is presented in Table 4. The consumption of biscuits, cake, candies and soft drinks were rampant in the area, especially among the adolescents and young adults. Cigarette smoking, sniffing of ground tobacco (snuff), drinking of wine were not observed in subjects under 20 years of age, but the bibbing of alcohol (palm wine, spirits, brandy, Locally-brewed Gin etc) was a common spectacle to behold in the study area.

Table 3: Age-frequency distribution of dental disorders in the study population (n = 80) of Ugbo-Odogwu (April-July 2006)

Dental disorders	Age-frequency distribution								Cumulative frequency no.
	≤10	11-20	21-30	31-40	41-50	51-60	60-70	≥71	
Specific dental disorders									
1. Abrasions	0	0	0	1	5	7	8	9	30
2. Attrition	0	0	0	2	4	5	6	8	25
3. Calculus	7	8	8	9	9	9	10	10	70
4. Caries	8	9	9	8	7	7	8	8	64
5. Gingivitis	1	1	6	7	8	8	9	10	50
6. Gum recession	1	3	5	6	6	7	7	8	43
7. Halitosis	4	6	9	9	9	9	10	10	66
8. Periodontitis	0	0	0	6	8	9	9	10	42
9. Stains	6	7	7	8	8	8	9	10	63
10. Teeth erosion	0	0	0	0	3	3	6	8	20
Cumulative frequency	27	34	44	56	67	72	82	91	473
Multiple (concomitant) dental disorders									
1) Abrasions with Halitosis	0	0	0	1	1	3	3	4	12
2) Abrasions with Periodontitis and Halitosis	0	0	0	1	1	2	2	4	10
3) Calculus with Attrition and Halitosis	0	0	0	0	0	1	2	5	8
4) Calculus with Erosions and Stains	0	0	0	0	0	1	1	3	5
5) Calculus with Halitosis	4	6	2	5	6	4	7	6	40
6) Calculus with Stains	4	6	7	6	5	6	6	10	50
7) Calculus with Stains, Gingivitis and Halitosis	0	1	0	2	1	1	4	3	12
8) Caries with Calculus	5	6	7	7	8	8	9	10	60
9) Caries with Calculus and Gum recession	0	0	2	3	4	6	7	8	30
10) Caries with Calculus and Halitosis	4	7	6	5	6	4	7	6	45
11) Caries with Calculus, Stains and Halitosis	2	4	3	4	5	4	3	5	30
12) Caries with Gingivitis	1	3	2	4	3	5	6	6	30
13) Caries with Periodontitis	0	0	1	2	4	5	7	6	25
14) Caries with Stains	2	3	1	3	3	2	3	3	20
Cumulative frequency	22	36	31	43	47	52	67	79	377

under 30 years old, but caries, halitosis and stains were widespread in the study population. Increase in dental caries was reported in 12 year-old school children in all social classes in Ondo State, Nigeria, but the increase was only noticed in 5 year-olds who came from the upper class (Olujugba and Lennon, 1986). Halitosis, gum recession and gingivitis were however more pronounced in the older age groups. Concomitant disorders, such as abrasion with

An adult respondent from Ugbo-Odogwu explained that they indulge in alcohol because of the chilly weather of the escarpment, especially during the harmattan season. Males took kolanuts, fruit juice, liquor, snuff and wine more than females (Figure 5). Apparently, the people were unaware of the dental health implications of their nutritional habits. Wilkins (1976) posited that some indulge in such habits for the fun of it; others out of necessity,

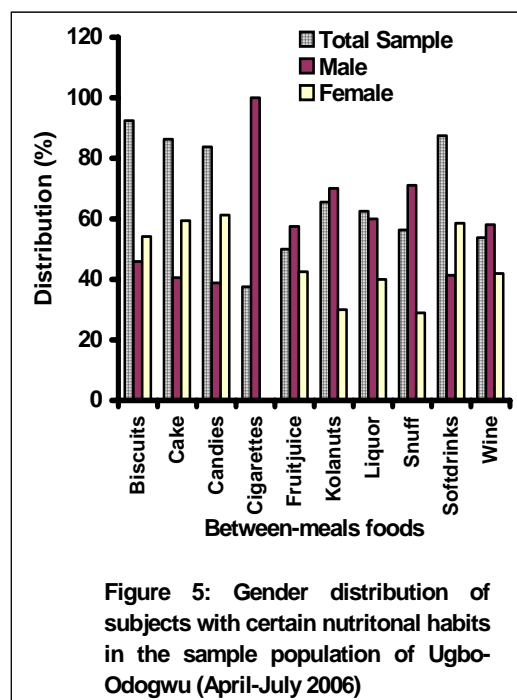
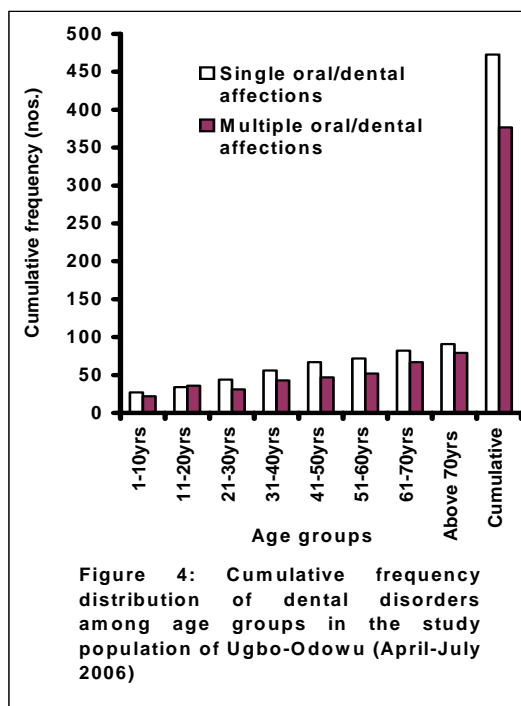


Table 4: Gender and age distribution of subjects with certain nutritional habits in the study population (n = 80) of Ugbo-Odogwu (April-July 2006)

Nutritional habits	Gender			Age (years)							
	Total no.(%)	Male no.(%)	Female no.(%)	≤10 no.	11-20 no.	21-30 no.	31-40 no.	41-50 no.	51-60 no.	61-70 no.	≥71 no.
Biscuits	74 (92.5)	34 (45.9)	40 (54.1)	10	10	10	10	10	9	8	7
Cake	69 (86.3)	28 (40.6)	41 (59.4)	10	10	10	10	9	9	6	5
Candies	67 (83.8)	26 (38.8)	41 (61.2)	10	10	10	9	9	8	6	5
Cigarettes	30 (37.5)	30 (100.0)	0 (0.0)	0	0	0	8	9	5	4	4
Fruit juice	40 (50.0)	23 (57.5)	17 (42.5)	2	2	5	8	9	7	5	2
Kolanuts	50 (65.5)	35 (70.0)	15 (30.0)	0	0	5	8	9	8	10	10
Liquor	50 (62.5)	30 (60.0)	20 (40.0)	3	4	4	5	8	9	8	9
Snuff	45 (56.3)	32 (71.1)	13 (28.9)	0	0	1	6	8	10	10	10

while many as a result of influence of peer groups, age, gender, location, economic status and availability of such foods and beverages. These factors were observed to be in operation in the study area. Kolanuts and hot drinks were usually presented to visitors at every home in the study area. Children were always given biscuits and snacks to be taken at break time in the school, while various brands of cigarettes, kolanuts, candies, soft drinks and snacks were hawked and openly patronized in the area. Brown nicotine stains from tobacco, red caffeine stains from kolanuts and stains of different colours were found on the teeth as reported. Caries activity became higher when sucrose was the major dietary component of soft drinks, candies and snacks. Unrefined sugar (carbohydrate) did not cause caries, calculus or any other dental disorder per-se, but most dental disorders resulted from plaque and calculus

formation due to poor oral hygiene (Shills *et al.*, 1994; Barker and Less, 1996). Carbohydrate foods usually stuck to teeth and oral tissues, and if not cleaned, formed the substrate for plaque. Widespread consumption of carbohydrate foods, biscuits, cakes and soft drinks may have influenced the formation of dental calculus, caries and stains in the study area. We observed that the rough way most people in the study area cracked palm-nuts and kernel with their teeth, as well as the improper used chewing sticks and brushes may not be unconnected with the levels of abrasions, gum recession and attrition reported in this study.

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REFERENCES

- ADEGBEMBO, A. O. (1995). National Survey of Dental Caries Status and Treatment Needs in Nigeria. *Journal of WHO Oral Health Country/Area Profile Programme*, 45: 35 – 44.
- BARKER, H. M and LESS, R. (1996). *Nutrition and Dietetics for Health Care*. 9th Edition. Churchill Livingstone, USA.
- HEYMSFILED, S. B., TIGBE, A. and WARY, Z. (1994). Nutritional Assessment by Anthropometric and Biochemical Methods. Pages 812 – 838. *In: SHILLS, M. E., OLSON, J. A. and SHIRES, M. (Editors). Modern Nutrition in Health and Diseases*, 8th Edition. Williams and Wilkins, USA.
- IKPEZE, O. O (2005). Stratification and Livestock Population Census for Enugu Urban, Nigeria: A Pilot Survey. *Animal Research International*, 2(2): 332 – 335.
- OLUJUGBA, O. O. and LENNON, M. A. (1986). Oral Epidemiology: Dental Caries Experience in 5 and 12 year-old School Children in Ondo State, Nigeria. *Journal of the Inter-Country Centre for Oral Health for Africa*. 1: 1 – 45.
- SHILLS, M. E., OLSON, J. A. and SHIRES, M. (1994). Assessment of Nutritional Status. Pages 112 – 308. *In: SHILLS, M. E., OLSON, J. A. and SHIRES, M. (Editors). Modern Nutrition in Health and Diseases*, 8th Edition. Williams and Wilkins, USA.
- WILKINS, E. M. (1976). *Clinical Practices of the Dental Hygienist*. 6th Edition. Lea and Febiger. Philadelphia.