

COMPARISON OF ORAL HEALTH STATUS OF ADULTS IN RURAL URBAN COMMUNITIES IN LAGOS, NIGERIA.

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ABSTRACT

Health inequalities and disparities are a global trend and could be found between rural and urban areas of both developed and developing countries. This study aimed to assess and compare health status of adults resident in rural and urban areas of Lagos State. A descriptive, comparative cross-sectional study conducted among 474 consenting adults aged 18-64 years in one rural and one urban local government area of Lagos State was done. Ethical approval was obtained from the Institutional Ethics Committee, Lagos University Teaching Hospital (LUTH). Data was obtained using an interviewer administered questionnaire. Descriptive statistics was used in data analysis whilst P values of <0.05 were considered significant.

Majority of the respondents were within the age brackets of 20-39 years, with a mean age of 36.4 ± 36.1 . Caries prevalence was 15.4% and 19.5%, mean DMFT was 0.72 and 0.62 in the rural and urban populations respectively. More respondents in the rural population (10%) (1.6389 ± 1.05) had poorer oral hygiene than the urban population (6.5%). (Mean OHI 1.555 ± 1.00). Urban respondents had greater need for periodontal treatment than rural respondents (2.3% vs 0.5%). There was a significant difference in the periodontal status and treatment need between rural and urban population. ($P=0.041$) But there was no significant difference in the oral hygiene status and dental caries experience between urban and rural populations. However, the oral hygiene status of the rural population was poorer. This study highlights the need for improved oral health promotion measures and preventive programs in rural and urban communities in Lagos state.

Keywords: Adults, Oral health status, Rural, Urban.

INTRODUCTION

Oral health remains an integral part of general health. Good oral health impacts significantly on general health contributing to an individual's overall well-being and quality of life, enabling optimal functioning. The oral cavity has a plethora of roles relating to daily living and functioning which include eating, speech, smiling, appearance and aesthetic appeal as well as conveying other social and emotional expressions using the teeth and adjoining structures. It contributes to an

individual's identity, total wellbeing and self-esteem. Dental diseases therefore constitute serious public health concerns globally (Petersen P.E.2003). They impact negatively on the quality of life affecting daily performance and general living.

The WHO recognizes that dental diseases such as dental caries and periodontal disease constitute a public health concern worldwide. Though the prevalence of dental caries appears low in some developing countries like Nigeria, the situation remains unsatisfactory (Sofola et al 2014). A vast majority of these lesions remain untreated and there is an increasing adoption of western dietary habits with consumption of food rich in refined sugar (Akpata E.S 2004). Oral diseases impact significantly on individuals. It influences their nutritional status, social activities, workplace productivity and family life. Individuals with poor oral health status are likely to experience dental pain, have low self-esteem from impaired aesthetics, miss work and perform poorly in life's daily activities (Gift et al 1992).

Recently, emerging evidences from both epidemiological and interventional studies have revealed a link between oral and systemic diseases such as cardiovascular and renal diseases (Igari et al 2014) Risk factors for most oral and systemic diseases include unhealthy diet and nutrition, harmful lifestyle practices like smoking, alcohol consumption and poor oral hygiene.

These variables are in turn influenced by oral health determinants such as race and ethnicity, socioeconomic status, geographical location, sex, age and cultural beliefs and practices (Sofola et al 2003).

In developing countries, investment in-oral care is low compared to developed countries (US Dept of Health 2008). Nigeria has been reported to have a low caries prevalence as evidenced by a mean DMFT (decayed, missing and filled teeth) of 4 or below in most communities (Akpata 2004, Soroye et al 2016) However, the restorative index remains extremely low. This leaves a lot of people with caries unattended to.

In Nigeria, there are few health services in the country and the existing ones are located in Urban cities (Orenuga 2006). The dentist population ratio is abysmally low with one dentist catering for a population of over 40,000 people. The majority of these very important set of health care providers remain in the cities, further

compounding the already existing health disparity between rural and urban climes in the country as obtains in most other countries (Jamiesen et al 2006). The traditional curative approach to treatment of oral disease is extremely expensive. It ranks as the fourth most expensive disease to treat in most industrialized countries with 5-10% of health expenditure going into the provision of oral health (Widstrom et al 2004). Scarce government resources are primarily allocated to emergency care and pain relief. It has been estimated that the cost of dental caries treatment alone in children would exceed the total health care budget for children if treatment were to be given (US Dept of Health 2000)

Variations exist in oral health practices and prevalence of oral disease worldwide (Ogunbodede et al 2015). In the developed countries, rural dwellers are more likely to have untreated dental caries than non- rural dwellers. Generally, they have lower prevalence of dental caries, more periodontal scores and poorer oral hygiene than urban dwellers in developing countries. (Azodo et al 2013) In developing countries, there is a vast difference in oral health status between urban and rural populations with enormous and widening disparities in access to quality care predominantly in rural areas. In the rural areas, their oral hygiene and health practices have been defined as suboptimal (Dela Sante 1983, WHO 2016). Very few studies however have attempted a comparison of the dental health status among adult rural and urban populations in a single study in Nigeria.

Furthermore, the need for evidence based epidemiological data which will be key to informing efficient health policies and programs to address existing disparities in health status of rural and urban population cannot be overemphasized. An understanding of the peculiarities and inherent differences in adult dental health status in rural and urban areas will help relevant stakeholders like governments and policy makers, non-governmental organization and rural human right groups as well as practitioners in the planning of oral health preventive and educational interventions with relevant messages to ensure optimum benefits and the attainment of oral health promotion goals. Hence this study seeks to assess and compare the dental health status of adult population in rural and urban areas of Lagos State.

MATERIALS AND METHODS

Study Location

This study was carried out in two randomly selected local government areas; namely Badagry (rural) and Ikeja, (Urban) in Lagos state, Nigeria. They constitute

part of the 20 local government areas in Lagos state, a cosmopolitan state located in the southwestern geopolitical zone of Nigeria. The state is regarded as the commercial capital of Nigeria.

Study design and Sample size determination:

A cross sectional study of adults was carried out to ascertain and compare the different dental health status as well as determinants of oral health of populations resident in these local government areas in Lagos State. A total of 474 adults within the ages of 18 to 64 years who consented to the study were selected using a multistage sampling technique after a calculated minimum sample size of 442 adults was done.

Data Collection: A pretested, structured interviewer-administered questionnaire was the instrument for data collection and it had three sections. Information on socio demographic background like age, sex, religion were assessed in section A, while oral hygiene practices and habits were assessed in section B and indices were used as tools for measurement of oral health status in section C. Indices included Oral hygiene index simplified by Green and Vermillion 1963 which assessed the oral hygiene status, CPITN index by Ainamo et al 1983 to assess the periodontal health and treatment needs, and the DMFT index and its derivatives by Klein, knutston and Palmer 1938 was used to assess the decayed, missing and filled teeth due to caries in order to ascertain the caries experience, treatment need and treatment failure of the respondents. Information on self-reported halitosis was obtained using the questionnaire. Selfreported halitosis was assessed in lieu of halitosis because of the anticipated challenge of using other diagnostic modalities, ie organolepsy, halimeter and gas chromatography to diagnose halitosis in such a field study. Two trained and calibrated examiners carried out oral examination on a mobile dental chair in conducive areas in the various locations using sterile gloves, mouth mirrors, probes and spatula for each patient under natural light with strict observance of principles of standard precautions according to WHO criteria. After examination, respondents who needed treatment were given referral letters to Lagos University Teaching Hospital, (LUTH) or any nearby dental health center.

Data Analysis

Data obtained were cleaned, coded and analyzed using Statistical Package for Social sciences (SPSS) for windows (Version 16.0 Chicago, USA). Results were expressed in percentages and frequencies. Appropriate Statistical tests (chi square

and t test) were employed to compare the oral health status between two locations with a set statistical significance of $p < 0.05$.

Ethical Consideration:

Approval for this study was obtained from the Health Research and Ethics Committee of the Lagos University Teaching Hospital, LUTH with approval no: ADM/DCST/HREC/APP/991 and the study commenced on the 6th of August, 2016. Informed consent was given by all participants before enrollment into the study.

RESULTS Table I: Distribution of the Respondents by Study Location

Location	Frequency N = 474	Percent (%)
Urban	247	52.1
Rural	227	47.9

More than 50% of the respondents were from the urban settlement while 47.9% were from the rural settlements.

Table II: Demographic characteristics of the respondents by location

Characteristics	Urban N= 247	Rural N = 227	Total
A. Age group			
Less than 20	19(7.7)	31(13.7)	50(10.5)
20 – 29	89(36.0)	56(24.7)	145(30.6)
30 – 39	76(30.8)	62(27.3)	138(29.1)
40 – 49	37(15.0)	45(19.8)	82(17.3)
50+	26(10.5)	33(14.5)	59(12.4)
B. Gender			
Male	177(71.7)	108(47.6)	285(60.1)
Female	70(28.3)	119(52.4)	189(39.9)
C. Religion			
Christianity	165(66.8)	154(67.8)	319(67.3)
Islam	80(32.4)	72(31.7)	152(32.1)
Others	2(0.8)	1(0.4)	3(0.6)

D. Tribe

Yoruba	144(58.3)	166(73.1)	310(65.4)
Igbo	48(19.4)	28(12.3)	76(16.0)
Hausa	32(13.0)	6(2.6)	38(8.0)
Others	23(9.3)	27(11.9)	50(10.5)

Table III: PREVALENCE OF DENTAL CARIES

LOCATION	PREVALENCE RATE (%)
Rural	15.4
Urban	19.5

(p >0.05)

Table IV: Mean DMFT of Respondents

Location	Mean DMFT (SD)
Rural	0.62 (1.46)
Urban	0.72 (1.63)

(p >0.05)

Table V: DMFT Derivatives

INDICES	PERCENTAGE (%)
Treatment Need Index	
Rural	50.4
Urban	61.1
Index of Treatment Failure	
Rural	60.6
Urban	48.1

Table II – IV,

The prevalence of dental caries was highest in the urban community (19.5%) with a mean DMFT of 0.72 than the rural community (15.4%) with a mean DMFT of 0.62. However, the index of treatment need for the rural and urban population was

50.4% and 61.1 respectively. Also, the index of treatment failure was 60.6 and 48.1% for the rural and urban population respectively.

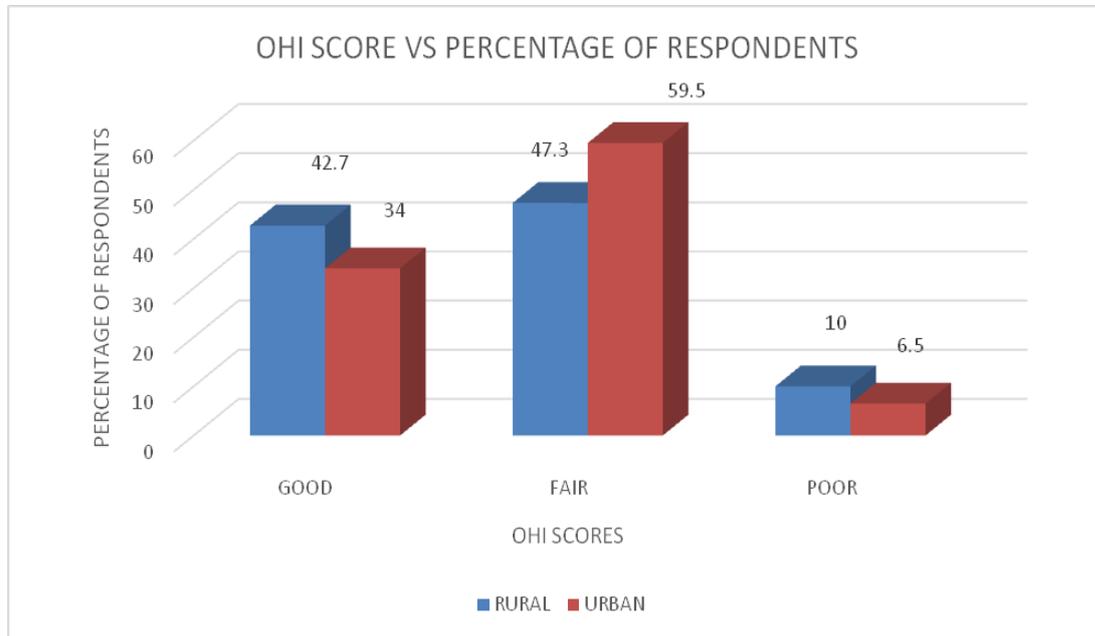


Figure I: ORAL HYGIENE STATUS BY LOCATION.

From the chart above, 34% and 42.7% of the respondents had good oral hygiene in the urban and rural communities respectively. The majority of people in the rural and urban communities had fair oral hygiene with a prevalence of 59.5% and

47.3% in the urban and rural communities respectively. However, more of those with poor oral hygiene status could be found in the rural (10%) than in the urban communities with a prevalence of 6.5%. The mean OHI score for rural residents was poorer (1.6389 ± 1.05) compared to urban (1.555 ± 1.00).

Table V : Oral hygiene practices among adults in the Rural and Urban Locations.

Characteristics/Variables	Urban N= 259	Rural N = 220	Total
Daily mouth cleaning			
-Yes	243(93.8)	116(52.7)	359(75.0)
-No	11(4.2)	89(40.5)	100(20.9)
-I don't know	5(1.9)	15(6.8)	20(4.1)
Number of Times Mouth is cleaned daily.			
-Once	159(61.4)	207(94.1)	366(76.4)
-Twice	100(38.6)	12(5.5)	112(23.4)
-Others	0(0.0)	1(0.4)	1(0.2)
Time of daily Mouth cleaning			
-Morning Alone	156(60.2)	208(94.5)	364(76.0)
-Morning and Night	95(36.7)	11(5.0)	106(22.1)
-Others	8(3.1)	1(0.5)	9(1.9)
Tool for cleaning mouth			
-Toothbrush	243(93.8)	144(64.5)	387(80.8)
-Chewing Stick	16(6.2)	57(25.9)	73(15.2)
-Foam	0(0.0)	19(8.6)	19(4.0)
Additives for cleaning mouth			
-Toothpaste	245(94.6)	185(84.1)	430(89.8)
-Salt	13(5.0)	18(8.2)	31(6.5)
-Charcoal	1(0.4)	10(4.5)	11(2.3)
-Sand	0(0.0)	3(1.4)	3(0.6)
-Ground glass	0(0.0)	4(1.8)	4(0.8)
Duration of toothbrush use			
-1 month	149(57.5)	41(18.6)	190(39.6)
-3 months	101(39.0)	103(46.8)	204(46.6)
-6 months	6(2.3)	17(7.7)	23(4.8)
>6 months	3(1.2)	59(26.8)	62(12.9)

From the table above, more respondents in the urban location clean their mouths with toothbrush and toothpaste twice a day compared to the rural location. Also, majority of the respondents in the rural location used their toothbrush for more than three months without changing it compared to their urban counterparts.

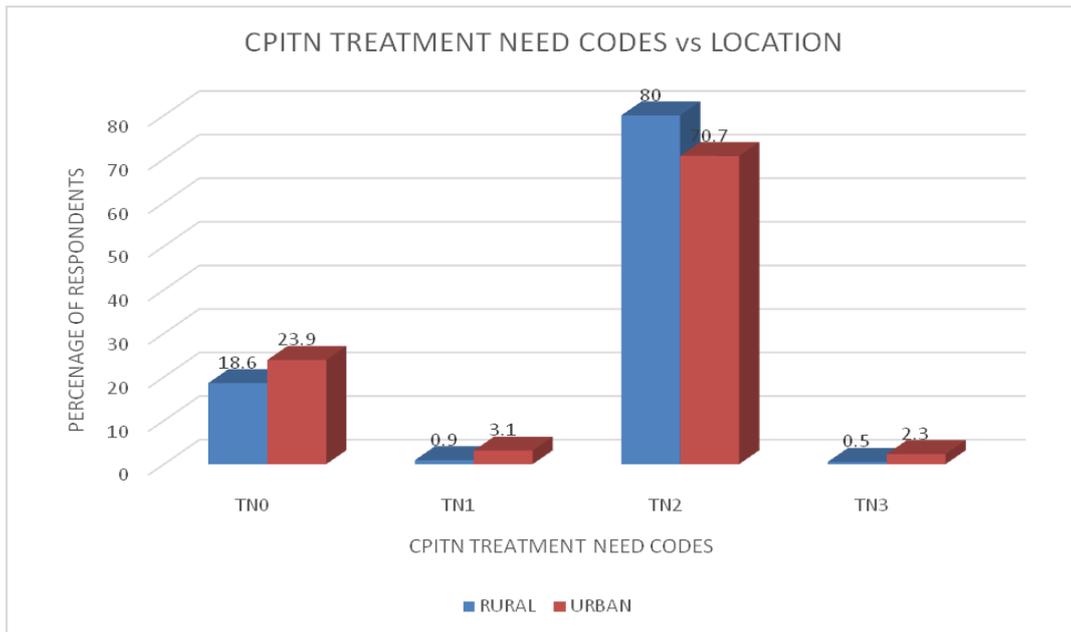


Figure II: Chart on the Community Periodontal Index of Treatment Needs (CPITN)

From figure II above, 3.1% of adults in the urban community and 0.9% in the rural community had bleeding gums on probing thus requiring oral hygiene instructions (TN1). The highest treatment need was TN2 which was required by 70.1% of individuals in the urban community and 80% in the rural community. Pocket depth of between 4 – 5mm were more common among respondents residing in the urban community (2.3%) compared to the rural population (0.5%). In this study, none of the respondents had pocket depths greater than 5.5mm.

Table VII: Relationship between Location and prevalence of self- reported Halitosis

	Yes	No	Chi-square	P-value
Location				
Urban	27(10.7)	232(89.3)	10.2	0.812
Rural	22(10.1)	198(89.9)		

The prevalence of halitosis is higher among respondents in the urban community (10.7) than the rural community (10.1%). However, this was not statistically significant.

Table VIII: Comparison in Oral health status between the Urban and Rural Community

Parameters	Location	N	Mean	STD	t-value	p-value
DMFT score	Urban	247	0.7287	1.64888	0.725	0.469
	Rural	227	0.6256	1.45001		
Oral Hygiene	Urban	247	1.555	1.00015	0.89	0.375
	Rural	227	1.6389	1.05362		
CPITN score	Urban	247	1.5061	0.88745	2.035	0.041
	Rural	227	1.6608	0.75516		

Dental Health

The student t-test was used to compare the health status between urban and rural residents. The result revealed that there was no significant difference in the dental caries experience between the urban and rural residents, so also is the oral hygiene. However, the community periodontal index of treatment needs showed significant difference between the urban and rural residents. This was so because the p-value is less than 5% level of significance used for the analysis.

DISCUSSION

Health disparities are population specific health differences in-terms of disease prevalence, access and outcomes that are avoidable and unfair when viewed from angles of social justice, ethics and human rights (Lee J.Y et al 2014, Zamaitiene et al 2016, Beaglehole 2009)

There is considerable variation in the distribution of health states globally. This study set out to assess the oral health status of adults resident in rural and urban areas with a view to comparing their oral health status as well as to find out the influence of socio-demographic characteristics on the oral health status in the respective populations. Hence, three very prevalent oral disease conditions; Dental caries, Periodontitis and Halitosis were assessed.

In this study, prevalence of dental caries was more in the urban population with a prevalence of 19.5% (mean DMFT=0.72) compared to the rural population which had a prevalence of 15.4% (mean DMFT=0.62). This result parallels similar studies carried out in other parts of Africa and Asia and falls well within reported rates in Nigeria of 4-30%. (Kida et al 2006, Omitola et al 2011, Sahil et al 2016, Bayat et al 2004). It is however lower than reports of 72.80% and 78.3% obtained in some European studies. (Blerin et al 2016, Vagas et al 2003). The high caries prevalence in these part of the world may be attributable to their dietary practices which is still largely composed of refined sugar. Though Blerin et al 2016 found a slight difference in caries status between urban and rural populations with a slightly higher prevalence for rural (75.9%) compared with urban (71.5%), the difference was not statistically significant. The same result was obtained in the present study as well as another study by Vargas CM et al. In the study by Sahil H et al 2016, the mean DMFT of the urban and rural populations were 2.27 and 1.78 respectively. Thus, more urban respondents had dental caries compared to their rural counterparts as reported in this study. However, studies by (Hessari et al 2008 and Wang et al 2002) reported a greater prevalence of caries in the rural population compared to the urban. A result attributable to poor oral hygiene

practices seen in the rural locations compared to the urban. Also, absence of modern amenities such as pipe borne water and the absence of fluoride in their drinking water may have contributed to an increase in caries status in the rural population compared to the urban. Furthermore, globally, differences in the prevalence of caries between urban and rural areas appear to be reducing due to socioeconomic development in rural areas with an increasing prevalence of dental caries in rural areas seen in these studies. In the present study, there was no statistically significant difference between the caries status of the rural and urban population and this result is in tandem with other findings in Europe, America and Asia. (Blerin et al 2016, Vagas et al 2003, Hesari et al 2008).

Though population averages have been known to underscore the severity of health states, they still provide a quantitative means of describing these states amongst population. The mean DMFT (caries experience) of both urban (0.72) and rural population (0.6) was very low according to the WHO criteria as they were below 1.2 and within the WHO global mean of three for the year 2000 for all countries. This result is similar with several studies in other developing countries of Asia and Africa and in Nigeria in particular. (Hesari et al 2008, Wang et al 2002, Okeigbemen 2004, Okoye 2010). Notwithstanding the very low caries status, the treatment need index was high (55.5%) and restorative index low and this compares favorably with similar studies carried out in Nigeria. (Akpata et al 2004, Omitola et al 2011, Okeigbemen 2004, Okoye 2010). Thus, a lot of the carious lesions remain unrestored.

Periodontal disease conditions are a spectrum whose primary etiologic factor still remains plaque biofilm. The present study discovered that the rural population had poorer oral hygiene (10%) than the urban population (6.5%). This trend of poorer oral hygiene being more prevalent in the rural population compares with similar studies carried out in other parts of the world and in Nigeria in particular. (Peterson et al 2005, Mughan et al 2014, Levin et al 2013, Sofola et al 2003.) The reasons for this may be due to neglect of oral health as a result of poor awareness and poor oral health literacy among rural dwellers. The lack of a structured oral health care system and poor oral hygiene practices like use of charcoal and obdurate adherence to the use of chewing stick may also be adduced for this poor oral hygiene status. However, the result obtained is in contrast to a similar study which found out that oral hygiene status of rural inhabitants was better than their urban counterparts. (Singh et al 2016)

In the present study, males, older people and less educated people had poorer oral hygiene than females, younger and more educated people and this result correlates with a systematic review on oral health status by Ogunbodede et al 2015 and gives further credence to the importance of oral health literacy in oral health promotion. Furthermore, Moslems were found to have poorer oral hygiene when compared with Christians.

The CPITN index is used to measure periodontal treatment need. However, it may also provide useful information on signs of periodontal disease. The majority of the population in both urban and rural locations were found to require prophylaxis and oral hygiene instruction as they had bleeding gums on probing and supragingival calculus. However, more people in the rural population required this treatment compared with their urban counterparts. The prevalence of those with periodontitis was higher in the urban than rural population. This result is similar to studies by Singh et al in Asia and Kameini et al in Africa. It also explains the pathogenicity of periodontal disease as not being an inevitable sequelae of gingivitis.

Halitosis is a public health disease that has received little attention. In this study, the prevalence of self-reported halitosis was 10.7 and 10.1 percent in the urban and rural populations respectively. This is very similar to reports of 2-40% obtained in a study by Muhammed et al in Asia. There is a slightly higher number of people with halitosis in the rural than urban areas. This result is not surprising because one of the principal causes of halitosis is poor oral hygiene and as reported in this study, respondents in the rural population had poorer oral hygiene than their urban counterparts.

CONCLUSION: In this study, the dental caries experience was higher among urban than rural respondents but the oral hygiene status was poorer among respondents in the rural areas than their urban counterparts. However, there was no significant difference in the oral hygiene status and dental caries experience between urban and rural populations but there was a significant difference in the periodontal status and treatment need between rural and urban population. (P=0.041)

RECOMMENDATION

There should be a conscious effort by relevant health authorities at the Local, State and Federal levels to bring oral health care closer to the people by integrating oral health care into general health. The education of all relevant stakeholders on the importance of oral health to general health is imperative. The

inclusion of primary oral health care into primary health care should not just be in theory but must be put to practice.

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