GLOBAL SCIENCE LIBRARY

RESEARCH

Dental & Craniofacial Research

Caries experience of young adults attending a tertiary health institution in Nigeria

Joan E Enabulele[1*], Kennedy E Omanudhowho[1] and Nneka M Chukwumah[2]

[1]Department of Restorative Dentistry, University of Benin Teaching Hospital, Nigeria

[2]Department of Preventive Dentistry, University of Benin Teaching Hospital, Nigeria

Abstract

Introduction: *Dental caries is a public oral health problem and one of the major unmet needs in oral health amongst children and young population. This study sought to assess the caries experience as well as determine the significant risk indicators for caries among young adults attending a tertiary health institution in Nigeria.*

Method: *A one year retrospective study of patients within the age group 20-40 years who visited the dental out-patient clinic of University of Benin Teaching Hospital. The data of interest retrieved from the files included demographics (Gender, Age, Marital Status and Occupation), presenting complaint, missing teeth, decayed teeth, filled teeth. All data collected was subjected to statistical analysis in form of frequencies, percentages, Mean, T-test, cross tabulations, logistic regression and chi square with level of significance set at 0.05 using Statistical Package of Social Sciences version 21.0.*

Results: *A total of 1,803 patients' records were used for the study. The caries prevalence in this study population was high (65.2%) with a mean DMFT score of 1.93±2.3.The mean DMFT for males was 1.75±2.02 while for females was 2.12±2.54 and this was statistically significant. Occupation and age were associated with caries experience. The tooth with the highest caries affectation was the first permanent molars.*

Conclusion:*The caries prevalence in this study population was high; occupation and age were significant risk indicators for caries, while married young adults had a greater caries experience.*

Keywords: *dental caries; young adults; caries experience*

Introduction

Dental caries is a public oral health problem and one of the major unmet needs in oral health amongst children and young population [1-4]. It's an infectious contagious disease that has been ascribed to an imbalance of normal molecular interactions between the teeth's surface/subsurface and the adjacent microbial biofilm [1]. It becomes expressed during a certain period of time as an accumulative demineralization which, if not treated, has the potential for producing cavities in the enamel and collateral damage in dentine and pulpal tissues [1-5].

Dental caries results from a complex pathway [6,7] with risk factors changeable during life and a person's risk for caries varying with time [6]. Dental caries has been reported to be related to an individual's lifestyle with socio-behavioural factors clearly implicated [6]. Some of these factors are poor dietary habits, poor oral hygiene, frequent consumption of refined carbohydrates, and frequent use of oral medications that contain sugar [6,9,10]. Physical and biological risk factors for enamel or root caries comprise insufficient fluoride exposure, inadequate salivary flow and composition, high numbers of cariogenic bacteria, need for special health care, and genetic factors [6,8,9].

Dental caries experience in permanent dentition is assessed by Decayed, Missing and Filled teeth index (DMFT) and at the World Health Assembly in 1982, World Health Organization (WHO) defined the acceptable dental health level for adults in different age groups as 4 DMFT at age 18 years, 6 DMFT for age 35–44 years and 12 DMFT for age 65+ years [11].

Dental caries has been studied mainly in groups of children and adolescents aged 3 to 15. However, adolescents older than 15 and young adults are frequently not included in oral health reports [1]. Although opinions and variations exist in the stages of human development, generally, a person in the age range 20-40 is considered a young adult [12,13]. Most epidemiological studies on dental caries affecting age-groups above 15 have been carried out in high-income countries and in military populations [1,14,15]. with a paucity of such studies in low-income countries and developing economies. This study sought to assess the caries experience as well as determine the significant risk indicators for caries among young adults attending a tertiary health institution in Nigeria.

Materials and Methods

This was a one year retrospective study of patients within the age group 20-40 years who visited the dental out-patient clinic of University of Benin Teaching Hospital between March 2012 and February 2013. Case note numbers of patients within this age group were identified and listed. The minimum sample size was calculated using the Corhan's formula (n = Z2pq/d2)for minimum sample size determination in a cross sectional study with the prevalence (78.7%) [16] of dental caries among young healthy adults taken as p and minimum sample size calculated to be 1806

A simple random technique involving picking of alternate case note numbers was used to select patients' record for the study. The data of interest retrieved from the files included demographics (Gender, Age, Marital Status and Occupation), presenting complaint,

missing teeth, decayed teeth, filled teeth. The DMFT index was calculated as follows [17]:For individual =DMF = D + M + F while for population: Mean DMF = Total DMF/Total number of the subjects examined. D (Decayed teeth) component was used to describe tooth records of carious tooth, filled tooth with recurrent decay, retained roots, defective filling with caries, temporary filling and filled tooth surface with other surface decayed. M component was used to describe records of missing teeth due to caries only and the F component was used to describe records of filled teeth due to caries. For the purpose of analysis any patient with DMFT of 0 was classified as "no caries experience" while patients with DMFT of 1 and above were classified as having "caries experience"

The standard International Labour occupational classification system [18-20]was adapted to classify the recorded occupation into five (5) socioeconomic groups: professionals and managerial officers and retirees of this type (e.g doctors, lawyers), skilled workers (e.g teachers, nurses), semi-skilled workers (e.g artisans), unskilled workers (traders), unemployed (students and other unemployed individuals).

Ethical approval was obtained from the Ethics and Research committee of the College of Medical Sciences, University of Benin. All data collected was subjected to statistical analysis in form of frequencies, percentages, Mean, T-test, cross tabulations, logistic regression and chi square with level of significance set at 0.05 using Statistical Package of Social Science (SPSS) version 21.0.

Results

A total of 1,803 patients' records were used for the study giving a retrieval rate of 99.8%. More than half (51.9%) were males with a male female ratio of 1:0.93. Majority (53.2%) were students and most (34.8%) of the patients were aged between 25-29 years (Table 1).

Characteristics	Frequency	Percent
Gender		
Male	936	51.9
Female	867	48.1
Marital status		
Single	1430	79.3
Married	373	20.7
Occupation		
Students/unemployed	960	53.2
Unskilled	191	10.6
Semi-skilled	144	8
Skilled	231	12.8
Professionals	277	15.4
Age (Years)		
20-24	569	31.6
25-29	627	34.8
30-34	382	21.2
35-40	225	12.5
Total	1803	100

Table 1. Socio-demographic distribution of the patients

Majority (65.2%) of the patients had at least one tooth carious with mean DMFT score 1.93±2.3. The mean DMFT for males was 1.75±2.02 while for females was 2.12±2.54 and this was statistically significant p=0.0001 (Table 2). The tooth with the highest caries affectation was the first permanent molars. The mandibular first molar had a higher frequency than the maxillary first molar. The right mandibular first molar had a higher frequency than the left while the reverse was the case in the maxilla. Toothache was the most frequent presenting complaint amongst the patients (Figure 1) and there was statistically significant relationship between caries experience and the patient's presenting complaints with more of those who presented with toothache, hole in tooth, swelling and missing teeth experiencing caries (Table 3).

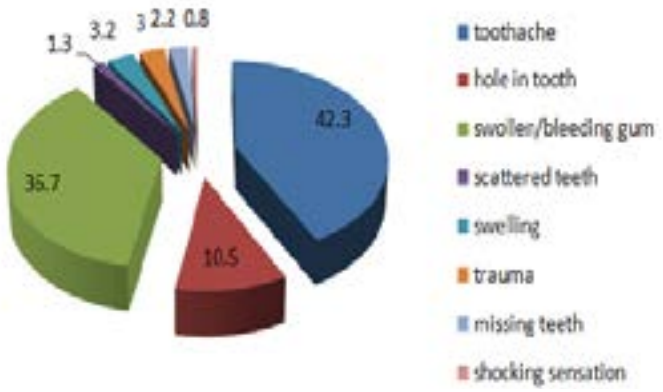

Figure 1. Presenting complaints among the patients

Gender	n	Mean	SD	SE
Male	936	1.75	2.02	0.66
Female	867	2.12	2.54	0.086

P=0.0001

Table 2. Relationship between mean DMFT and gender

Presenting complaint	Presence of caries		Total n (%)
	Yes n (%)	No n (%)	
Toothache	640 (84.0)	122 (16.0)	762 (100.0)
Hole in tooth	174 (92.1)	15 (7.9)	189 (100.0)
Swollen/bleeding gum	229 (34.6)	432 (65.4)	661 (100.0)
Scattered teeth	9 (37.5)	15 (62.5)	24 (100.0)
Swelling	51 (87.9)	7 (12.1)	58 (100.0)
Trauma	20 (37.0)	34 (63.0)	54 (100.0)
Missing teeth	37 (92.5)	3 (7.5)	40 (100.0)
Shocking sensation	15 (100.0)	0 (0.0)	15 (100.0)
Total	1175 (65.2)	628 (34.8)	1803 (100.0)

P=0.0001

Table 3. Relationship between caries experience and presenting complaints

Occupation and age were associated with caries experience (Table 4). Unskilled and semiskilled patients had higher caries experience while there was increasing caries experience with increasing age.

Characteristics	Presence of caries		Total n (%)
	Yes n (%)	No n (%)	
Gender p=0.08			
Male	592 (63.2)	344 (36.8)	938 (100.0)
Female	583 (67.2)	284 (32.8)	867 (100.0)
Marital status p=0.0001			
Single	864 (60.4)	566 (39.6)	1430 (100.0)
Married	311 (83.4)	62 (16.6)	373 (100.0)
Occupation p=0.0001			
Students/unemployed	556 (57.9)	404 (42.1)	960 (100.0)
Unskilled	152 (79.6)	39 (20.4)	191 (100.0)
Semi-skilled	109 (75.7)	35 (24.3)	144 (100.0)
Skilled	158 (68.4)	73 (31.6)	231 (100.0)
Professionals	200 (72.2)	77 (27.8)	277 (100.0)
Age (years) p=0.0001			
20-24	359 (63.1)	210 (36.9)	569 (100.0)
25-29	375 (59.8)	252 (40.2)	627 (100.0)
30-35	255 (66.8)	127 (33.2)	382 (100.0)
35-40	186 (82.7)	39 (17.3)	225 (100.0)
Total	1175 (65.2)	628 (34.8)	1803 (100.0)

Table 4. Relationship between caries experience and socio-demographic characteristics

Standard multiple regression showed that age, gender, occupation and marital status accounted for 2.4% variance in DMFT of the young adults. This shows that there are factors other than that tested which should also be used to predict DMFT.

Predictors	B	P-value	Odds Ratio (95% CI)
Gender	0.112	0.29	1.11 (0.90-1.35)
Marital status	0.895	<0.0001	2.45 (1.73-3.46)
Age		<0.0001	
20-24 years	0.113	0.65	1.12 (0.69-1.83)
25-29 years	-0.354	0.12	0.70 (0.45-1.09)
30-34 years	-0.369	0.1	0.69 (0.45-1.07)
Occupation		<0.0001	
Students/unemployed	-0.557	0.002	0.57 (0.41-0.81)
Unskilled workers	0.248	0.28	1.28 (0.82-2.01)
Semi-skilled workers	0.192	0.43	1.21 (0.75-1.95)
Skilled workers	0.001	0.99	1.00 (0.67-1.49)
Constant	-0.141	0.7	

Table 5. logistic regression model of predictors of caries experience

DMFT is positively related to the age and marital status of the young adults. However, there was no absence of multicollinearity (Tolerance >0.2, variance inflation factor <5). Binary logistic regression showed that age, gender, occupation and marital status can explain between 0.77 and 1.07 variance in caries experience of the young adults. The model correctly predicts 26.4% of young adults without any caries experience and 88.1% of young adults with caries experience. Overall the model predicts 88% of caries experience correctly.

Table 5 shows the odds of experiencing caries was 1.1 times more likely when the young adult is a female however this was not statistically significant. Also, married young adults were more likely to have experienced caries compared to single young adults with an odd of 2.45 and this was statistically significant ($p \leq 0.0001$). Young adults who were students/unemployed were less likely to have experienced caries compared to professionals with an odd of 0.57 and this was statistically significant ($p=0.002$).

Discussion

Dental caries being a multifactorial disease is dependent on a lot of factors some of which includes diet, oral hygiene, age, sex, socioeconomic status, use of fluorides, attitude to oral health to mention a few and these factors all interact over time to affect the pattern of the disease [21]. We therefore attempted to determine how some of these factors influenced the caries experience in young adults.

The caries prevalence in this study population was high (65.2%) with a mean DMFT score of 1.93±2.3, this was slightly higher than that reported among young adults in Hong Kong which gave a caries prevalence of 59% with a mean DMFT of 1.4 [22] and Finland which observed a caries prevalence of 78.7% and DMFT of 4.1 [16]. This may be due to the increased sample size of our study and the wider age range of young adults studied.

Socio-demographic risk factors that were associated with caries experience in this study were occupation and age. The unskilled and semiskilled had a higher caries experience, this is similar to the findings of Roberts-Thomson and Stewart [23] and may also be due to financial barriers to assessing health care thus resulting in patients presenting late with the disease well advanced. An increased caries experience was also noticed with increasing age, though we could not find a study reporting the same age range of young adults as our study, a Mexican study [1]reported an increase in caries experience with increasing age and the reason for that may be the index used (DMFT) which records the life time caries experience of an individual which is irreversible. Another factor that may be responsible for this increase maybe increasing social responsibilities which may consume more of the individual's time and finances thus resulting in trivializing oral health till it is symptomatic.

Regression analysis showed that age, gender, occupation and marital status only accounted for 2.4% distribution of these factors. Thus it is in consonance with the fact that dental caries is a multifactorial disease and dependent on other factors occurring over time [21,24]. This study did not look at other factors such as oral hygiene, diet, habits and regular dental visits which may play a significant role in caries experience, as it is near impossible to assess for all the caries risk indicators in a cross sectional study. Furthermore the DMFT was positively related to age and marital status of young adults in this study population thus showing a linear association between the two independent variables, we did not find any literature to compare this finding with.

This study found an increased likelihood of having a caries

experience when married compared with single young adults with an odd of 2.45 and was statistically significant, this finding is in contrast to that reported by Treasure and co-workers [24] who found an increased odd of singles having increased caries experience compared with married or cohabiting couples, this odd was less than that reported in this study and was not statistically significant compared to divorced/separated and widowed in their study. The reason for this could be due to a resulting increase in financial and social responsibility with less attention is paid to oral health. This study cannot be wholly compared with that of Treasure et al. [24], as this study population was limited to the 20-40 year old age range.

Conclusion

The caries prevalence in this study population was high; occupation and age were significant risk indicators for caries, while married young adults had a greater caries experience.

References

1. Garcia-Cortes JO, Medina-Solis CE, Loyola-Rodriguez JP, Mejia-Cruz JA, Medina-Cerda E, et al. Dental caries experience, prevalence and severity in Mexican adolescents and young adults. *Rev Salud Publica.* 2009; 11: 82-91.
2. Gushi LL, Soares Mda C, Forni TI, Vieira V, Wada RS, et al. Dental caries in 15-to-19 year-old adolescents in Sao Paulo State, Brazil, 2002. *Cad Saude Publica.* 2005; 21:1383-1391.
3. Peres MA, Peres KG, Traebert J, Zabot NE, Lacerda JT. Prevalence and severity of dental caries are associated with the worst socioeconomic conditions: a Brazilian cross-sectional study among 18-year-old males. *J Adolesc Health.* 2005;37:103-109.
4. Archila L, Bartizek RD, Gerlach RW, Jacobs SA, Biesbrock AR. Dental caries in school-age children residing in five Guatemalan communities. *J Clin Dent.* 2003;14:53-58.
5. Pitts NB, Stamm JW. International Consensus Workshop on Caries Clinical Trials (ICW-CCT) – Final consensus statements: Agreeing where the evidence leads. *J Dent Res 83(SpecIss C).* 2004; C125-128.
6. Hossein H. Oral Health among Young Adults and the Middle-aged in Iran. Department of Oral Public Health, Institute of Dentistry, Faculty of Medicine, University of Helsinki, Helsinki, Finland. 69 pp. 2009.ISBN 978-952-10-5458-7.
7. Fejerskov O. Changing paradigms in concepts on dental caries: consequences for oral health care. *Caries Res.* 2004;38:182-191.
8. Anderson M. Risk assessment and epidemiology of dental caries: review of the literature. *Pediatr Dent.* 2002; 24:377-385.
9. Fejerskov O, Kidd EAM. Dental caries: the disease and its clinical management. Copenhagen: Blackwell Munksgaard, 2003.
10. Bratthall D, HänselPG.Cariogram – a multifactorial risk assessment model for a multifactorial disease. *Community Dent Oral Epidemiol.* 2005; 33:256-264.
11. A review of current recommendations for the organization and administration of community oral health services in northern and Western Europe. Report of a WHO workshop, Oslo, Norway. Copenhagen, World Health Organization Regional Office for Europe.1982:88.
12. The theoretical basis for the life Model-Research and Resources on Human Development Retrieved 2009-08-2011.
13. Levinson DJ. "A conception of Adult Development", in Richard D. Gross ed. Key Studies in Psychology. 304-305
14. Sgan-Cohen HD, Katz J, Horev T, Dinte A, Eldad A. Trends in caries and associated variables among young Israeli adults over 5 decades. *Community Dent Oral Epidemiol.* 2000; 28: 234-240.
15. Kruger E, Thomson WM, Poulton R, Davies S, Brown RH, et al. Dental caries and changes in dental anxiety in late adolescence. *Community Dent Oral Epidemiol.* 1998;26:355-359.
16. Tanner T, Kamppi A, Pakkila J, Patinen P, Rosberg J, et al. Prevalence and polarization of dental caries among young, healthy adults: cross-sectional epidemiological study. *Acta Odont Scand.* 2013;7:1436-1442.
17. Hiremath SS. Indices. In: Hiremath SS. Textbook of preventive and community Dentistry. (2ndedn). India: Elsevier. 2011: 198-221.
18. Budlender D. Whither the International Standard Classification of Occupations (ISCO-88)? Working Paper No. 9. Bureau of Statistics. Policy Integration Department. ILO, Geneva. 2003.
19. Elias P. "Status in employment: a world survey of practices and problems", in Bulletin of Labour Statistics, 2000-1.
20. Hoffmann E. "International Statistical Comparisons of Occupations and Social Structures: Problems, Possibilities and the Role of ISCO-88". 1999. [http://www.ilo.org/public/english/bureau/stat/papers/index.htm].
21. Hopcraft M, Morgan M. Dental caries experience in a young adult military population. *Aus Dent J.* 2003; 48: 125-129.
22. Lu HX, Wong MCM, Lo ECM, McGrath C. Risk indicators of oral health status among young adults aged 18 years analyzed by negative binomial regression. *BMC Oral Health*. 2013; 13:40
23. Roberts-Thomson K, Stewart JF. Risk indicators of caries experience among young adults. *Aus Dent J.* 2008; 53: 122-127.
24. Treasure E, Kelly M, Nuttal N, Nunn J, Bradnock G, White D. Factors associated with oral health: a multivariate analysis of results from the 1998 Adult Dental Health survey. *Brit Dent J.* 2001; 190: 60-68.

***Correspondence:** Enabulele Joan, Department of Restorative Dentistry, University of Benin Teaching Hospital, Benin City, Edo State, Nigeria, Tel: +2348037275813, E-mail: emien.enabulele@uniben.edu

Received: May. 15, 2018; Accepted: Jun. 02, 2018; Published: Jun 14, 2018

Dent Craniofac Res. 2018;1(1):1
DOI: gsl.dcr.2018.00004