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Research Paper

Knowledge, Practices and Perceptions of Oral hygiene in a tropical semi-urban setting (Bafia-Cameroon)

H. Blaise Nguendo-Yongsi
Department of Public Health, Institute for Population Studies, University of Yaoundé II, Cameroon

***ABSTRACT: Background**: Oral diseases are the most common disease that affect people throughout their life time, causing pain, discomfort, disfigurement and even death. The Global Burden of Disease Study 2017 estimated that oral diseases affect nearly 3.58 billion people worldwide. **Objective** : This study aims to address knowledge, attitude, and practices regarding the prevention of oral diseases among young and adult population, from both urban and rural areas, of Bafia, Cameroon. **Methods**: A commnunity-cross-sectional study was carried out. 2,840 individuals were requested to complete an adapted WHO Integrated Package for Basic Oral Care questionnaire on sociodemographic and practice characteristics; knowledge on risk factors; attitude and practices towards the prevention of oral diseases. The statistical significance of any difference between the residency context and age-group was determined using the Chi-square test. **Results**: The study population was finally composed of 2,759 participants of age 05-69 years. Nearly 86% of the participants are aware that oral health affects general health, and 67% know that teeth brushing can prevent tooth decay or keep from having gum troubles. 45.4% of urban youth vs 53.5% of rural youths were not aware that dental bleeding is a primary sign of poor oral health, and 62.8% vs 44.3% respectively disagree that dietary habits and teethbrush techniques increase the risks of oral diseases. However, about 43% have reported brushing their teeth daily. We found significant difference in brushing habit between age groups and residency areas (P = 0.001) with yuths and city dwellers showing a better dental practice. Over the preceding one year, 45.0% of the participants had had some problem with their teeth and/or gums, but only 11% visited the dentist. Oral health-related perception was globally relatively poor. **Conclusion**: The results showed a lack of knowledge among general population. Therefore, systematic community-oriented oral health promotion programmes are needed to target inhabitants' lifestyles and needs, for youth and those living in rural areas. A prevention-oriented oral health care policy would seem more advantageous than the present curative approach. **Keywords**: Oral hygiene, knowledge, practices, perceptions, public health, Bafia, Cameroon.*

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I. INTRODUCTION

Oral diseases are one of the most prevalent problems throughout the world. Despite great improvements in the oral health of population, global problems still persist.[1] Therefore, preventive strategies for oral health are an essential public health priority since oral heal conditions are, for example, the most common chronic disease among general population worldwide. Maintenance of adequate oral health depends on the adoption of specific behaviors, namely dental checkups, toothbrushing frequency, diet and sugar consumption, and other methods of interproximal cleaning.[2,3] These habits play an essential role in the prevention of dental diseases since adequate oral hygiene habits and regular use of dental services have shown effectiveness in reducing the prevalence of these diseases.[4] As oral health and general health are interrelated, a preventive approach consisting of daily oral hygiene procedures can stabilize progressive lesions and prevent acute complications, so contributing to a gratifying oral function and satisfying quality of life.[5] A necessary condition for maintaining oral health entails to seriously taking care of the oral cavity (mouth). This can only be achieved through oral hygiene. Defined as a set of living practices to ensure good oral health, oral hygiene participates in the ability to speak, smile, touch, chew, and express emotions through facial expressions confidently, without pain and without embarrassment.[6] A recent study revealed that oral hygiene is an important public health concern and that, oral diseases have significant negative effects on populations quality of life.[7] Globally, oral disease is a major global public health problem affecting more than 3.5 billion people, and more than 70% of the world's population (mainly in low- and middle-income countries) do not have access to adapted and affordable oral care.[8] These oral diseases and conditions are the source of a significant disease burden in many countries

and their effects are felt throughout life. However, so far dentistry has not been able to tackle this problem decisively. As oral health is a fundamental human right, WHO has identified priority areas on which efforts should be focused.[9] Among others, we have maintenance of oral hygiene and prevention of oral diseases. It is on the strength of this recommendation and especially of the fact that oral health is a resource of daily life and not the goal of life, that we undertook this study among the general population, especially since its oral health status is not well known due to the scarcity of surveys carried out in this area. Then, obtaining data from a population of this semi-urban setting could be essential to influence the development of oral health-care policies, to establish oral health promotion and prevention programs and to allocate medical-dental services appropriately. Thus, the objective of this study was to assess oral health-related knowledge, perceptions, and practices among Bafia's inhabitants. All this in the interest of effectively preventing oral disease, and developing a prevention program at the community level.

II. METHODS

Study area : This study focuses on the city of Bafia, which is located in Cameroon slightly above the Equator between 4°40'00''- 4°47'00'' latitude North and 11°07'30''- 11°17'30'' longitude East. It is a semi-urban setting located about 120 km from Yaoundé the national capital, at 1,100 and 1,300 m above sea level, and over the southern Cameroonian plateau in the Mbam-and-Inoubou department, over an area of approximately 1,300 km^2. The setting hosts nearly 69,270 inhabitants, and urban dwellers comprise 55% of the total population. Bafia is essentially an administrative city. Economic activities are dominated by agriculture, hunting, fishing, and other informal activities such as catering and small retail trade.

Study design, target population, and sampling: An observational and descriptive cross-sectional design study was conducted. Though a community-level study, the survey targeted only individuals aged 5 years and above. The sampling size was determined using the following formula: $n = \frac{\mathbf{z^2 \times p(1-p) \times f \times k}}{\mathbf{r} \times e^2}$ (n: size of the sample; e : sought precision; f : average household size; k : non-response rate; r : proportion of households with health conditions; z : value of the normal distribution for the desired confidence level 1-α; p : expected coverage or prevalence rate). From this, a size of 2,840 individuals was determined. The study being a cross-community one, participants were selected based on a stratified cluster random sampling, involving the 50 enumeration areas defined by the Census national agency[10]. The first cluster consisted of rural areas comprising 8 enumerated areas whereas the second cluster consisted of urban areas comprising 42 enumerated areas. Regarding the cluster variable, the rural areas had relatively few inhabitants and hence a much lower proportional weight compared with the urban areas. Therefore, the sample was disproportionately stratified by cluster using a post-sample weighting factor, to ensure a low error rate on the overall performance. Community results included a weighting coefficient applied to inhabitants of each of the clusters, in order to cancel out the influence of their different population sizes. The final sample was made up of 2,217 participants from the urban areas and 623 participants from the rural areas. Thus, this sample was considered as representative of the whole Bafia population of five years of age and more.

Survey tool: The survey relied on a structured and standardized questionnaire, adapted from the WHO Integrated Package for Basic Oral Care questionnaire[11]. With the aim to answer the research question, the questionnaire was composed of constructs pertaining to socio-demographic and practice characteristics, knowledge regarding the risk factors for oral diseases, attitude towards the prevention of oral diseases, management practice about preventive measures for oral diseases, and information about oral diseases. Assessment of participant's oral health-related attitude included items on self-perceived oral health status and number of visits to a dentist for treatment of dental problems in the last one year. Assessment of a participant's oral health-related practices included questions on frequency of cleaning, cleaning aids used, and tobacco use. Assessment of a participant's oral health-related knowledge included questions on benefits of fluoride, necessity of regular dental visits, the role of sugar in causing dental caries, and the importance of teeth in the body. The questionnaire was administered face-to-face to all participants by trained teams consisting of ten graduate students in epidemiology and two dentists. Prior to the data collection, questions were pre-tested among comparable groups in order to assess reliability and validity. Tests of reliability of answer were carried out in each cluster from a sub-sample of participants whose same questionnaires were given five days after completion of the initial questionnaire, and validity rate of at least 80% was considered.

Data collection and management: Data were processed and analysed using Social Sciences (SPSS-PC+) for Windows as described by Maroco[12]. Bivariate and multivariate analyses of the data on oral health knowledge, attitudes and practices were based on frequency distributions. The Chi^2 test was used in the statistical evaluation of the bivariate frequency distributions. All tests were applied at a significance level of 5%. An "oral health knowledge score" was calculated by adding the total number of items answered correctly by the participants. Thus, oral health knowledge scores ranged from 0 to 6, with higher scores indicating better dental knowledge.

Ethical considerations : The study was approved by the *Institutional Research Ethics Board for Human Health* of the School of Health Science (Catholic University of Central Africa). The informed written consent of each individual was taken prior to recording oral health, and confidentiality of responses was assured.

III. RESULTS

Demographic Details : A total of 2,840 individuals were selected to participate to this study. However, 2,759 completed the questionnaires, yielding a response rate of 97.1%. Of the 2,729 participants, 1,473 (53.4%) were males and 1,286 (46.6%) were females, that is a sex ratio of 1.1. Majority of the participants i.e. 52.4 % belonged to 17 years and more vs 47.6 % who belonged to 05-17 years age group. The level of education varied among the respondents with majority of them (77.9%) having attended school vs 22.1% who never went to school. Table 1 also indicates that what ever the residency context (rural or urban), most of the participants are involved in informal activities (61.4%), and 18.6% in agricultural and hunting activities.

Table 1 : Sociodemographic characteristics of the respondents

Variables	**Urban (n=2158)**		**Rural (n=601)**	
Gender	Frequency	%	Frequency	%
Male	1035	48.0	438	72.9
Female	1123	52.0	163	27.1
Age group				
[05-17]	1131	52.4	183	30.5
]17-75]	1027	47.6	418	69.5
Education level				
No Education	445	20.6	164	27.3
Primary level	647	30.0	287	47.7
Secondary level	903	41.8	139	23.2
University level	163	07.6	11	01.8
socio-professional status				
Unemployed/Retired	118	05.5	98	16.3
Civil servants	93	04.3	16	02.6
Self-employed professionals	216	10.0	10	01.7
Informal activities	1523	70.6	171	28.4
Farmer/hunter	208	09.6	306	51.0

Oral health-related knowledge: This aspect was assessed by asking questions to which participants had to respond with with 'agree', 'disagree', or 'don't know'. Table 2 presents the distribution of respondents by their answers to statements on knowledge and attitudes towards oral health. The differences in responses given by youth and adults were are slightly different. The majority of youth in urban areas reported that regular dental visits help preventing oral diseases whereas these answers were less frequent among rural youth. In rural areas, 58% of the youth were not aware whether eating and drinking sweet things can cause tooth decay while nearly half of the adults stated that consumption of sweet items may be harmful to teeth. Majority of the participants, wether in urban or rural areas, were aware about role of fluoride in caries prevention. 45.4% of urban youth vs 53.5% in rural areas were not aware that dental bleeding is a primary sign of poor oral health, and 62.8% vs 44.3% respectively disagree that dietary habits and teethbrush techniques increase the risks of oral diseases ($P<0.112$). Beside, urban and rural adults are in that agreement. Regardless of group age and area of residence, most of the respondents agree that healthy teeth means caries free ($P<0.001$), and that oral health affects general health ($P<0.003$).

Table 2 : Distribution of participants' knowledge about oral hygiene according to area of residence and group age in Bafia

Variables	Youths (5-17 years)		Adults (≥18 years)		*P* value
	Urban (n=1131)	Rural (n=183)	Urban (n=1027)	Rural (n=418)	
Oral health affects general health					
Agree	731 (64.6%)	64 (35.0%)	571 (55.6%)	139 (33.2%)	0.003
Disagree	303 (26.8%)	37 (20.2%	285 (27.8%)	63 (15.1%)	
Don't know	97 (08.6%)	82 (44.8%)	171 (16.6%)	216 (51.7%)	
Keeping natural teeth is not that important					0.005
Agree	319 (28.2%	91 (49.7%)	327 (31.8%)	273 (65.3%)	
Disagree	684 (60.5%	74 (40.4%)	406 (39.5%)	131 (31.3%)	
Don't know	128 (11.3%	18 (09.8%)	294 (28.6%)	14 (03.3%)	
Regular visits to the dentist keep away dental problems					0.019
Agree	829 (73.3%)	90 (49.2%)	647 (63.0%)	319 (76.3%)	
Disagree	137 (12.1%	37 (20.2%)	144 (14.0%)	88 (21.1%)	
Don't know	165 (14.6%)	56 (30.6%)	236 (23.0%)	11 (02.6%)	
Teeth brushing can prevent tooth decay					
Agree	903 (79.8%)	104(56.8%)	862 (83.9%)	272 (65.1%)	0.001
Disagree	144 (12.7%)	41 (22.4%)	101 (9.8%)	77 (18.4%)	
Don't know	84 (07.5%)	38 (20.8%)	64 (6.3%)	69 (16.5%)	
Teeth brushing keep from having gum troubles					
Agree					0.121
Disagree	497 (43.9%)	112(61.2%)	882 (85.9%)	179 (42.8%)	
Don't know	389 (34.4%)	31 (17.0%)	91 (08.9%)	74 (17.7%)	
	245 (21.7%)	40 (21.8%)	54 (05.2%)	165 (39.5%)	
Fluoride strengthens teeth					
Agree	977 (86.4%)	126(68.8%)	874 (85.1%)	243 (58.1%)	0.003
Disagree	61 (05.4%)	41 (22.5%)	75 (07.3%)	114 (27.3%)	
Don't know	93 (08.2%)	16 (08.7%)	78 (07.6%)	61 (14.6%)	
Eating and drinking sweet things does not cause tooth decay					0.117
Agree	241 (21.3%)	39 (21.3%)	404 (39.3%)	76 (18.2%)	
Disagree	682 (60.3%)	38 (20.8%)	239 (23.3%)	97 (23.2%)	
Don't know	208 (18.4%)	106(57.9%)	384 (37.4%)	245 (58.6%)	
Dietary habits and teethbrush techniques increase the risks of oral diseases					0.112
Agree	197 (17.4%)	49 (26.8%)	399 (38.8%)	80 (19.1%)	
Disagree	710 (62.8%)	81 (44.3%)	102 (09.9%)	74 (17.7%)	
Don't know	224 (19.8%)	53 (28.9%)	526 (51.2%)	264 (63.2%)	
Bleeding is a primary sign of poor oral health					
Agree					0.004
Disagree	411 (36.3%)	34 (18.6%)	207 (20.1%)	93 (22.2%)	
Don't know	207 (18.3%)	51 (27.9%)	311 (30.3%)	137 (32.8%)	
	513 (45.4%)	98 (53.5%)	509 (49.6%)	188 (45.0%)	
Healthy teeth means caries free					
Agree	948 (83.8%	117(63.9%)	872 (84.9%)	311 (74.4%)	0.001
Disagree	51 (04.5%)	23 (12.6%)	71 (06.9%)	49 (11.7%)	
Don't know	132 (11.7%)	43 (23.5%)	84 (08.2%)	58 (13.9%)	

Oral health-related behaviors and practices: Table 3 provides details concerning oral health habits in the community. Hence, we want to highlight just few points. Tooth cleaning habits were more reported by urban participants than rural participants (P<0.113), and some difference according to group age, as rural adults claim seldomly or never clean their teeth (57.6%). For those who said they clean their teeth, regardless of age group and place of residence, it is much more to make teeth bright than to prevent bleeding gums or oral diseases. The majority of respondents reported that they make use of toothbrushes for cleaning their teeth, with the exception of adults living in rural areas who are still bound to chewing sticks. Most of the respondents claimed to brush their teeth at least twice a day and such practice was reported regardless or the residency areas. The majority of participants brushed their teeth in the morning and very less in the evening, relatively more often by urban respondents. For respondents who claimed to brush their teeth once a day, most reported brushing in the morning, more often by adults living in the urban areas (71.0%). Furtheremore, regardless of age and residency area, most of the participants brushed their teeth with a hard-bristled brush, though it is tending to happen in rural areas (P<0.001). At both group ages and living areas, three-quarters of study participants clean their teeth

for less than 2 minutes. Regarding the direction of brushing stroke, only 12.0% brush their teeth in a combination of vertical, horizontal, and circular motion, according to the WHO recommendations. This recommended method was performed most frequently by adults, while horizontal or vertical brushing technique was more common in youths living either in rural or urban areas (P<0.131). In general, fluoridated toothpaste was used frequently (63.1%). This practice showed only minor variation by age or residency area. Besides, let's mention the significant use of other aids such as chewings (26.3%) and toothpowder (11.3%), with a balanced trend in rural and urban participants (P<0.117). The findings indicate consumption of sweet/sugar foods and drinks and statistically significant differences by location appeared for most of the answers (P<0.002). Sweet items were often consumed by respondents living in urban areas, particularly in youths. Majority of participants claimed consuming alcohol and tobacco, however with higher levels in youths (52.4% for alcohol and 11.6 for tobacco) and adults (62.4% for alcohol and 29.2% for tobacco) living in rural areas. As shown in table 3, the main reactions to bleeding gums were to stop brushing the teeth (36%) rather than to pay more attention or to see a dentist (09.0%). When noticing signs of caries, participants living in urban answered that they don't care if no pain (30.7% of youths vs 39.0% of adults); whereas several rural participants reported that they would try to cope with problems or control pain (44.3% of youths vs 69.9% of adults). The findings also highlights the utilisation of dental services, with almost all the participants, regradless of age group or residency areas, reporting that they had never seen a dentist. About one-fifth of the participants had seen a dentist within the previous 1-2 years, particularly participants living in urban areas (06.3% of youths vs 08.2% of adults). Among respondents who claimed having had a dental visit, 10.9% of youths and 12.9% of adults living in urban areas, versus 06.6% of youths and 06.4% of adults living in rural areas, reported that this was for teeth scaling. Visits to the dentist for check up and fissure sealing were rare, but slightly frequent in urban and rural adults.

Table 3 : Distribution of participants' habits and practices regarding oral hygiene according to group age and area of residence in Bafia

Variables	Youths (5-17 years)		Adults (≥18 years)		*P* value
	Urban	Rural	Urban	Rural	
Frequency of tooth cleaning †					
Seldom or no cleaning at all	45 (04.0%)	89 (48.6%)	127 (12.4%)	241 (57.6%)	0.113
Once daily	1039(26.8)	79 (43.2%)	729 (71.0%)	128(30.7%)	
At least twice daily	47 (04.2%)	15 (08.2%)	171 (16.6%)	49 (11.7%)	
Reasons for tooth cleaning/brushing†					0.003
Clean/bright teeth	929 (82.1%	97 (53.0%)	602 (58.6%)	287 (68.7%)	
Bleeding gums prevention	84 (07.5%)	20 (10.9%)	111 (10.8%)	52 (12.4%)	
Oral diseases prevention	118 (10.4%)	66 (36.1%)	314 (30.6%)	79 (18.9%)	
Reasons for not cleaning/brushing teeth ††					0.003
No time or bother me	97 (53.3%)	53(54.6%)	77 (53.1%)	53 (67.9%)	
Useless/good teeth are hereditary	14 (07.7%)	08 (08.3%)	06 (04.2%)	--- (---%)	
Gums are bleeding when brushing	38 (20.9%)	17 (17.5%)	34 (23.4%)	14 (17.9%)	
No benefits from brushing	33 (18.1%	19 (19.6%)	28 (19.3%)	11 (14.2%)	
Tooth cleaning instrument †					0.215
Finger/Piece or tissue	19 (28.2%	11 (06.1%)	48 (04.7%)	86 (20.6%)	
Chewing sticks	84 (60.5%	74 (40.4%)	106 (10.3%)	201 (48.1%)	
Toothbrush	1028 (11.3%	98 (53.5%)	873 (85.0%)	131 (31.3%)	
If Tooth brush, what type †††					0.001
Hard bristle	483 (51.4%)	74(57.8%)	411 (55.2%)	190 (59.4%)	
Medium bristle	319 (34.0%)	23 (17.9%)	228 (03.7%)	57 (17.8%)	
Soft bristle	128 (13.6%)	31 (24.3%)	105 (14.1%)	73 (22.8%)	
Duration of brushing †††					
Less than 2 mn	829 (88.4%)	98 (76.6%)	599 (80.5%)	262 (81.9%)	---
2 mn and more	109 (11.6%)	30 (23.4%)	145 (19.5%)	88 (18.1%)	
Method of brushing †††					
Vertical	273 (29.1%)	71(55.5%)	200 (26.9%)	194 (60.6%)	0.131
Horizontal	577(61.5%)	39 (30.5%)	443 (59.5%)	77 (24.1%)	
Combination of above and circular	88 (09.4%)	18 (14.0%)	101 (13.6%)	49 (15.3%)	
Toot cleaning aids used †					
Chewings	138 (43.9%)	79 (43.2%)	282 (27.4%)	207 (49.5%)	0.117
Toothpowder	52 (34.4%)	31 (16.9%)	103 (10.0%)	127 (30.4%)	
Fluoridated Toothpaste	941 (21.7%)	73 (39.9%)	642 (62.6%)	84 (20.1%)	
Dietary habits†					
Foods rich in adhesive sugars	477 (42.2%)	39 (21.3%)	111 (10.8%)	21 (05.0%)	0.002
Sweet drinks	418 (36.9%)	27 (14.7%)	75 (07.3%)	14 (03.3%)	
Regular consumption of alcohol	143 (12.7%)	96 (52.4%)	527 (51.3%)	261 (62.4%)	

Regular consumption of tobacco	93 (08.2%)	21 (11.6%)	314 (30.6%)	122 (29.2%)	
What do you do in case of teeth bleeding†					
Never had teeth bleeding	341 (30.1%)	101(55.2%)	781 (76.0%)	293 (70.1%)	0.001
Stop brushing	682 (60.3%)	68 (37.2%)	139 (13.5%)	104 (24.9%)	
Pay more attention to gums and visit a dentist	108 (09.6%)	14 (07.6%)	107 (10.5%)	21 (05.0%)	
What do you do if having signs of tooth decay†					
Don't care if no pain	347 (30.7%)	102(55.7%)	401 (39.0%)	126 (30.1%)	0.014
Just try to cope with the problem	710 (62.8%)	81 (44.3%)	500 (48.7%)	292 (69.9%)	
Go and see a dentist	74 (06.5%)	--------	126 (12.3%)	--------	
Number of times having visited a dentist†					
Never	1047(92.6%	168(91.8%)	917 (89.3%)	388 (92.8%)	0.003
1-2 times	)	15 (08.2%)	84 (08.2%)	30 (07.2%)	
3 times and more	71 (06.3%)	------	26 (02.5%)	-----	
	13 (01.1%)				
Preventive actions during last 1-2 years†					
None	969 (85.8%)	171(93.4%)	836(31.0%)	372 (89.0%)	---
Check up buccal cavity	----	----	31 (03.1%)	07 (01.7%)	
Fissure sealing	38 (03.3%)	----	27 (02.6%)	12 (02.9%)	
Teeth scaling	124 (10.9%)	12 (06.6%)	133 (12.9%)	27 (06.4%)	
† : n=2759, with 1131 urban youths, 183 rural youths, 1027 urban adults, and 418 rural adults †† : n=502, with 182 urban youths, 97 rural youths, 145 urban adults, and 78 rural adults ††† : n=2130, with 938 urban youths, 128 rural youths, 744 urban adults, and 320 rural adults					

***Self-perceived oral health status* :** Table 4 presents the self-perceived oral health status of the study participants. Nearly 35.3% of urban youths versus 18.7% of rural youths stated that their teeth were excellent, whereas 12.7% and 53.5% respectively claimed to have poor teeth. Besides, 51.4% of urban adults answered that their teeth were in excellent condition versus 31.6% of the rural adults. With the exception of adults living in rural areas, the others were not satisfied with the status of their gums. Most of the participants often experienced teeth pains and/or teeth sensitivity, particularly adults living in urban areas (40.5%); however and in terms of occasional experience, there is no significant differences in urban participants and in youth living in rural areas (P<0.003). Regardless of age and living areas, most of the participants reported that they avoided smiling or speaking wide openly because of halitosis (P<0.001). The same pattern has been observed regarding teeth discoloration, however with more lower proportion in youths than in adults, reagrdless the residency area ((P<0.034).

Table 4 : Perceptions of oral health according to group age and area of residence in Bafia

Variables	**Youths (5-17 years)**		**Adults (≥18 years)**		***P* value**
	Urban (n=1131)	**Rural** (n=183)	**Urban** (n=1027)	**Rural** (n=418)	
State of teeth					
Excellent	399 (35.3%)	36 (18.7%)	528 (51.4%)	132 (31.6%)	0.036
Fair	588 (52.0)	49 (26.8%)	379 (36.9%)	88 (21.0%)	
Poor	144 (12.7%)	98 (53.5%)	120 (11.7%)	198 (47.4%)	
State of gums					
Excellent	306 (27.0%	47 (25.7%)	314 (30.6%)	287 (68.7%)	0.018
Fair	611 (54.0%)	80 (43.7%)	602 (58.6%)	79 (18.9%)	
Poor	214 (19.0%)	56 (30.6%)	111 (10.8%)	52 (12.4%)	
Pain/tooth sensitivity					
Often	197 (17.4%)	25 (13.7%)	416 (40.5%)	29 (07.0%)	0.003
Occasionally	523 (46.2%)	97 (53.0%)	318 (31.0%)	184 (44.0%)	
Rarely	411 (36.3%)	61 (33.3%)	293 (28.5%)	205 (49.0%)	
Worried about discolaration	439 (38.8%)	59 (32.3%)	256 (24.9%)	55 (13.2%)	0.034
No	692 (61.2%)	124 (67.7%)	771 (75.1%)	363 (86.8%)	
Yes					
Worried about halitosis	222 (19.6%)	24 (13.1%)	215 (21.9%)	26 (06.2%)	0.001
No	909 (80.4%)	159 (86.9%)	812 (79.1%)	392 (93.8%)	
Yes					

IV. DISCUSSION

Oral hygiene is a set of practices that help get rid of food debris, prevent periodontal disease, and be healthy. These practices date back to prehistoric times when initial observations of gingivitis, tartar deposits, and loosening of teeth were made on samples of human teeth.[13] It is understandable why teeth cleaning is still currently perceived as part of personal hygiene. Therefore, it is important to have an accurate idea of individuals' knowledge and practices for planning and evaluation of community oral health programmes purposes. Yet, levels of oral health knowledge and attitudes in Bafia are above all low, with however slight differences between subgroups. Previous studies had highlighted differences in oral health knowledge between urban and rural subgroups[14] and between young and adults individuals[15, 16]. The present study confirms that high knowledge and positive dental attitudes are found more often among urban than rural populations. The relatively higher level of education of parents and easier access to information through the media in cities may explain these differences[17].

The importance of oral health for general health was not acknowledged by the vast majority of participants. Adults recognized the importance of oral health to physical tasks related to farming activities. The fact that oral health is an essential aspect of their ability to relate to the community on social levels was pointed out in other studies[18]. The fact that most of the respondents acknowledge that regular visits to the dentist keep away dental problems, that teeth brushing can prevent tooth decay and keep them from having gum troubles, is quite encouraging from a public health perspective. It shows that despite a precarious economic situation, use of tooth brush is still popular. The relatively low cost of toothbrushes and their availability in almost all small shops, probably explain this widespread use. Urban areas facilitate access to toothbrushes and toothpaste, and their uses are considered a sign of modern life style[19]. This result is nonetheless contrasted by those of Niazi et al[20] and Norton et Addy who indicated that teeth rubbing and chewing sticks remain the most frequent tool for oral hygiene by the majority of people in East and West rural africa communities, and that their widespread use can be linked to traditional practices related to aesthetic and religious values[21]. More than half of the participants correctly identified the action of fluoride as preventing tooth decay. This trend was seen in other studies conducted in adolescents suggesting the need to increase the awareness of the benefits of fluoride[22, 23]. Participants living in urban areas and rural youngsters reported more cosmetic reasons for using fluoride. This reinforces the media influence as well as the need for adolescents and urban dwellers to have a good appearance[24,25]. The fact that most of the participants are not aware of dietary habits and teethbrush techniques in the increasing of oral diseases, is worrisome. This suggests a robust dental hygiene education campaign specifically targetted to the relevant youth and urban dwellers. This study helped to describe habits and practices towards oral health. Our results emphasize that almost all of the respondents clean their teeth, at least once a day. This habit, mentioned in some previous studies[26,27], clearly indicates that brushing remains a pattern related to personal hygiene. The prevalence of brushing at least twice a day being low in this setting, indicate that geographical differences in oral habits remain a challenge for oral health, and therefore that there is more room for improvement. The results found in this study showed that the main reason for toothbrushing is to clean teeth and have bright teeth. This highlights the importance given to cosmetic reasons rather than preventive health reasons seen in other studies[28,29]. Toothbrushing for preventing bleeding gums was reported by several participants, yet blood on toothbrush was recognized as a sign of gum disease by the respondents. This agrees with studies where the participants showed higher awareness of caries than periodontal conditions, and that were unaware of the role of toothbrushing in the prevention of bleeding gums[30]. The respondent's dietary habits are subject to reflection, as it is well known that foods rich in adhesive sugars and sweet drinks, along with tobacco are quite harmful to teeth. Nevertheless, the intake of soft drinks and sweet foods was frequent and significantly higher in urban dwellers compared to rural dwellers. This suggests two comments : (i) cultural food habits of Africans play an essential role in their dietary habits[31], (ii) presently, dietary practices and nutrition are undergoing transition in most developing countries of Africa, particularly consumption of sugars is growing rapidly, mostly in urban areas[32]. Such an habit in Bafia inhabitants require appropriate guidance, particularly towards the youths, as adolescence is a time of heightened caries activity due to an increased intake of cariogenic substances and because the external environment had an increasing impact on behavior[33]. Answers to the questions on illness behaviour revealed that most respondents don't care or cope with symptoms through intensified oral hygiene when having bleeding from gums or signs of tooth decay. In parallel to the observations on oral hygiene habits, the level of utilisation of dental services is too low and varied significantly between urban and rural areas, and this pattern may reflect socio-economic backgrounds and different availability of dental services or hospitals. Results showed that almost the majority of participants never visited a dentist at all, with urban young and rural adults participants doing so significantly less. This result might be related to the economic crisis in Cameroon, as well as the fact that the public health system does not offer oral health services in most regions of the country. And this confirms findings from the Brasilia study carried out in 2007[34]. However, less than one fifth of the respondents reported a dental visit one or two times a year, a figure much lower as reported for individuals of industrialised and Asian countries[35, 36, 37]. The same pattern was observed

with regard to preventive actions as, with the exception of urban adults, most of individuals living in rural areas and young living in urban areas never undertook preventive actions. Analysis revealed that the less than one-fith who took preventive actions, have done so to perform regular self-care practices, and this may suggest that they had been instructed in oral self-care by a relative or a dentist. In the present study, more than half of the total participants considered their teeth and gums statuses to be at least fair, otherwise poor. Furthermore, they are concerned about their teeth discoloration and bad breath. In short, they perceived their oral health as poor. This overall perception is similar to previous studies conducted in several countries[38,39,40].

V. CONCLUSION

Oral health problems are currently public health concerns as they affect all segments of the population, although to varying degrees. Therefore, assessment of knowledge, perceptions, and habits of a population is essential for the adequate understanding of the oral health-care needs of the society. This population-based study found that city dwellers generally had better knowledge about dental health, but attitudes and self-perception towards dental health were not significantly different between age groups. This aspect along with critical determinants of oral healthy habits should be routinely taken into consideration in order to tailor education and counseling to the unique needs of a particular community. Thus, oral health knowledge is considered to be an essential prerequisite for health-related behaviors and practices, and a significant predictor of intention to improve public oral health. Although knowledge alone does not necessarily lead to desirable health behaviors, knowledge gained can serve as a tool to empower population groups with accurate information about health, enabling them to take action to protect their oral health. From the data collected, several differences were found. These differences can be used to tailor interventions to minimize social and territorial inequalities. We then think that evidenced-based effective dental awareness programs are needed in order to improve dental-related practices among age groups and territories. In light of the scarce resources and the current pattern of oral diseases in Cameroon, a prevention-oriented oral health care policy would seem more advantageous than the present curative approach. Oral health education would play the most important role and schools may provide effective settings for oral health education programmes. The province health authorities should be encouraged to develop targeted community-oriented oral health care promotion strategies aimed at further improvement of oral selfcare practices, regular dental visiting habits and better control of oral disease.

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Conflict of interest statement

The author declares that there is no conflict of interest.

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