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ASSESSING THE QUALITY OF LIFE IN TOOTHLESS ADULTS IN NDÉ DIVISION (WEST-CAMEROON)

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ABSTRACT

Oral health is essential for the general condition and quality of life. Loss of oral function may be due to tooth loss, which can affect the quality of life of an individual. The aim of our study was to evaluate the quality of life in toothless adults in Ndé division. A total of 1054 edentulous subjects (partial, mixed, total) completed the OHIP-14 questionnaire, used for assessing the quality of life in edentulous patients. Males (63%), were more dominant and the ages of the patients ranged between 18 to 120 years old. Caries (71.6%), were the leading cause of tooth loss followed by poor oral hygiene (63.15%) and the consequence being the loss of aesthetics at 56.6%. Almost all of our surveyed patients were partially edentulous (95.4%), only 5.31% compensated with prostheses and absence of discomfort with some missing teeth was found in 89.3% of patients. Difficulty in chewing (39.6%) was the general complaint followed by discomfort to eat at 38%. The mixed edentulous people had the worst quality of life with a functional dissatisfaction of 80.71%. In general, the partial edentulous and prosthesis carriers had a good quality of life. The impact of missing teeth on the quality of life of the inhabitants of the Ndé division is weak. Posterior partial missing teeth does not necessarily lead to a very poor quality of life and prosthetic rehabilitation is necessary and constitute the best solution for mixed and total in toothless adults. This study recommends that visiting the dentist once a year would be ideal to avoid some causes of edentulous in Ndé division of Cameroon.

KEYWORDS: Quality of life, Adults, Edentulous, Compensates, Ndé division.

INTRODUCTION

The World Health Organization (WHO) defines health as a state of complete well-being, whether physical or mental, social, spiritual, and not just as an absence of disease or infirmity. It achieves some of its objectives through public health whose objective is to prevent and cure diseases, prolong life, improve the health, psychic and social vitality of populations by collective means.[1] To this end, WHO is interested in the quality of life, defined as the perception that an individual has of his place in existence, in the context of the culture and value system in which he lives in relation to his goals, expectations, standards and concerns. It is a very broad concept influenced in a complex way by the physical health of the subject, his psychological state, his level of independence, his social relations as well as his relation with the essential elements of his environment.[2]

Since oral health is essential for the general condition and quality of life of a human being, it is characterized by the absence of oral or facial pain from oral or pharyngeal tumours swelling, infection or oral lesion, periodontal disease, loss of teeth, and other diseases limit the ability to bite, chew, smile and / or talk about a person, and thus its psychosocial well-being.[3] The dental organ for its part, participates in vital functions such as: feeding, chewing, swallowing and phonation.[4] The loss of these functions may be due to edentulousness, which is the loss of one or more dental organs. Caries and periodontal disease are the main causes of tooth loss. Worldwide, 60% to 90% of school children and about 100 % of adults have caries. The loss of teeth from a certain age is still considered by many people as a natural consequence of aging, while it is

preventable. This is actually a direct consequence of late management of tooth decay and periodontal disease.[5]

However, one or more missing teeth can negatively affect our self-esteem, social relationships and quality of life by limiting our food choices and therefore our nutrition and general health. If left untreated, partial toothlessness (the absence of one or more teeth) can cause the remaining teeth to move; total toothlessness (absence of all teeth) causes the loss of the vertical occlusion dimension (VOD) and therefore creates pathologies in the temporo-mandibular joint (TMJ). Missing teeth also causes bone resorption, making denture fitting difficult or even impossible.

The complete loss of natural teeth is widespread and particularly affects the elderly. According to WHO, almost 30% of people aged 65 to 74 no longer have natural teeth.[3] This is also reflected in a study conducted by Ngapeth E and Coll on the pilot project integration of oral healthcare into primary healthcare in the South region of Cameroon, specifically at the Sangmélima District Health Hospital, where it was found that among the 65 and over age group, 97.3% had missing teeth, of which 17.3% had an absent tooth and 34% had less than 20 teeth in the mouth.[6] This study shows that toothless gap can be a public health problem in Cameroon. Therefore, there is a need to investigate the situation in other areas of the country. The patient's knowledge of his oral problems is a key element for guidance and therapeutic follow-up.[7] The current model of oral health requires that all parameters be considered (medico-dental aspects and psycho-social influence).[8] Since any health problem is reflected in health needs, this study aimed to understand the experiences and feelings of partial or total edentulous adults that highlight the negative impact on the quality of daily life of patients residing in the Ndé division of Cameroon.

MATERIAL AND METHODS

Study Site, study population and ethical consideration

We conducted our study in the targeted populations of Ndé Division (West-Region, Cameroon), having approximately 123661 inhabitants (2001). It has an area of 1524 Km^2 and has 4 sub-divisions: Bangangté, Bassamba, Bazou, and Tonga. It has 13 large villages (Bangangté, Bassamba, Bazou, Tonga, Balengou, Bamena, Batchingou, Bangoua, Bangang-Fokam, Badoumga, Bangoulap, Bakong, and Bahouoc).

Before the field works started, clearance was obtained from the Institutional Ethics Committee of the Université des Montagnes (CIE-UdM) under authorization N° 2018/113/UdM/PR/CAB/CIE, the Bangangté District Health under reference N° 032/L/MINSANTE/ DRSPO/DS Bgté and from the Ndé Divisional office Bangangté under reference N° 008/AR/F36/A2. Our study population was the edentulous people of the Ndé Division aged at least 18 years without distinction of sex and socio-professional category.

Type of study and sample collection

This cross-sectional descriptive study was conducted over a period of five months, from February to July 2018. Our sampling was of convenience: using a map of the Ndé Division we located the 4 Health-districts, then in each district we choosed 4 villages and then we made the choice of homes randomly within a few communities' health areas visited.

Data collection procedure

Before going down to the field, we met the administrative authorities, the village chiefs and the health areas Officers, in order to become acquainted with the communities constituting the area and to be informed of their availability. The population was informed of the anonymity of the study and had signed an informed consent form. Our strategy was door-to-door collection, and after the random selection of communities to investigate, we proceeded initially with the use of a questionnaire to collect the patient's personal information and secondly with intraoral examination. Data collection was done with a questionnaire and the clinical information was completed in our individual survey fact sheet. The questionnaire was used to collect; socio-demographic data, oral health, Oral Health Impact Profile-14 (OHIP-14), Quality of Life Assessment, General Health, while the Individual Survey Data Sheet was used to record the different types of edentulism using an odontogram. The OHIP-14 questionnaire included 14 questions to assess the negative impact of edentulism on the daily lives of edentulous adults. Each question included the following proposed answers: 1=Very often; 2=Quite often; 3=Occasionally; 4=Rarely; 5=Never; 6=I don't know.

Data analysis

For this study, the quality of life related to oral health will be measured by OHIP-14. The prevalence and severity of OHIP were the dependent variables. The prevalence referred to patients who answered "fairly often or very often" to at least one OHIP-14 question. The severity being the sum of all the answers of the 14 questions of OHIP-14 after their numerical coding. The latter uses the LIKERT scale with the 5 options: never (score 0), rarely (score 1), occasionally (score 2), quite often (score 3) and very often (score 4). Thus, the severity varies from 0 to 56: 0 meaning an OHRQOL (Oral Health-Related Quality of Life) very satisfactory and adequate that is to say that oral health does not disturb the daily life of the subject; 56 signified the worst OHRQOL showing that oral problems prevent the person from performing properly in their daily activities.

On the other hand, the independent variables were: socio-demographic characteristics (age, sex, level of education, profession, civil status), clinical characteristics (localization, number of lost teeth,

number of breaches, length of gap, arches, unilateral gap, position of gap versus natural teeth, modification of previous breaches and posterior occlusion pairs). To these variables were added the knowledge on the prosthetic treatment, the need for prosthetic treatment and the reasons for the non-demand of the prosthetic treatment.

The breakdowns of the data were made as follows: the age of the patient was categorized into 4 classes with a range of 20 years between classes: 18-30, 30-50, 50-70, 70-90, and 90-120. The gender was divided into male and female. The level of education included 3 classes: illiterate, primary, secondary and higher. The location of dental losses was classified as anterior loss, posterior loss and anteroposterior loss. The previous losses concerned only the incisivo-canine block of the two arches, the posterior only the premolar-molar block of the two arches and anteroposterior concerned the two associated anterior and posterior blocks. The number of lost teeth was distributed in increments of: 1-5 teeth, 5-10 teeth, and 10 teeth +. Regarding, the number of gaps in the mouth, the loss of wisdom molar was not accounted for.

For breach length, a breach of a tooth was categorized as unitary, two teeth were considered short, 3 to 4 teeth were said to be medium, and more than 4 teeth were said to be long. In case of several breaches, the longest determined the category. The arches were divided into three groups according to whether they had lost their teeth either in the maxillary, the mandible, or on both arches.

Regarding unilaterality of the breach, the breaches were classified in two groups according to whether they are unilateral or bilateral. The position of the gaps with respect to the teeth was grouped into recessed, free and encastro-free breccia. Occlusion pairs were divided into 4 classes: 0-2, 3-4, 5-7, 8-10 Pair of Posterior Occlusion.

About the need for treatment, patients were grouped into two groups: those who feel they need prosthetic treatment and those who feel they do not need it. Reasons for the non-demand of the prosthetic treatment was an open question and the options were grouped into: finance, lack of information, fear of the dentist, discouragement by other peoples.

To assess the quality of life, anyone who has ever answered OHIP-14's questions and has toothless gap that does not affect their daily lives was considered satisfied. Never represented the lowest OHIP score that is "0". On the other hand, for all the toothless people who had answered very often or quite often to the questions of the OHIP-14 were considered dissatisfied and that the impact of the missing teeth is negatively important. Very often equals the largest OHIP score of "4", and quite often a score of "3". We have cumulated all of the 14 questions ever from the OHIP to have satisfaction and all "very often or often enough" to have dissatisfaction. Also, we described as good quality of life all those who have a low OHIP score and poor quality of life those who reported high scores per item.

Data was entered using the CSPRO. 7 software and are analysed by R version 3.4.2 then presented in the form of figures and tables using Microsoft Excel 2007. To evaluate the association between the cumulative quality of life score and the binary independent variables, we used the Wilcoxon rank sum test. For the other categorical variables, we used the Kruskal-Wallis test and presented 95% confidence intervals, medians and p-values. For continuous variables we used the Spearman correlation test.

The significant P-value for the study is < 0.05.

RESULTS

For this research work, 17 health areas in the Ndé Division were surveyed; and we investigated 1054 edentulous adult people. Table I shows the proportions of surveyed individuals in each health area.

Table I: Proportions of surveyed individuals for assessing the quality of life in toothless adults in 17 health areas of the Ndé Division, Cameroon.

Health areas	Numbers of surveyed individuals	Percentages of total sample
Bangoua	55	5.22%
Batchingou	16	1.52%
Bazou	**117**	**11.1%**
Feugnoun	27	2.56%
Ndipta III	13	1.23%
Projet Route du Noun	16	1.52%
Toukop	32	3.04%
Bangang-Fokam	20	1.9%
Tonga	**162**	**15.4%**
Bakong	20	1.9%
Balengou	61	5.79%
Bamena	49	4.65%
Bassamba	**123**	**11.7%**
Bangangté	**208**	**19.7%**
Bandounga	26	2.47%
Bangoulap	58	5.5%
Bantoum I	51	4.84%
Total	**1054**	**100%**

According to Table I, we investigated more in Bangangté health area, 208 (19.7%) and Tonga, 162 (15.4%). The least investigated areas were Ndipta III 13 (1.23%), Batchingou and Projet Route du Noun with respectively 16 (1.52%) each.

Socio-demographic data

Distribution of the study population by sex

This figure below illustrates the distribution of the population examined by sex

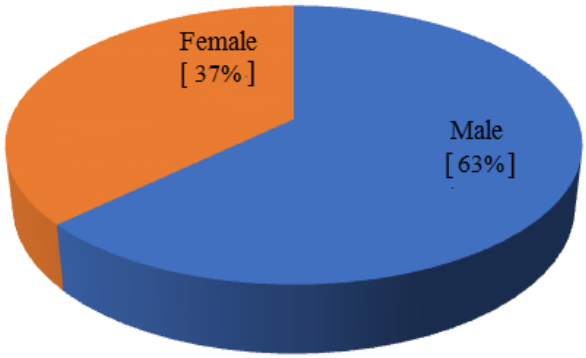


Figure 1: Distribution of the study population by sex of surveyed individuals for assessing the quality of life in toothless adults in Ndé Division of Cameroon.

Our sample consisted of twice as many men as women, men were represented at 664 (63%) and women at 390 (37%).

Distribution of study population by age

The median age of our sample was 49 ± 17.38 years; the youngest individual was 18 years old and the oldest 120 years old.

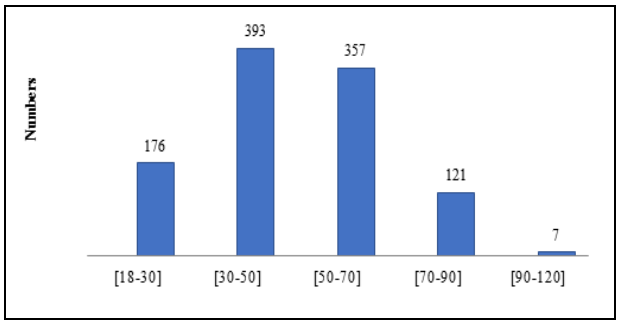


Figure 2: Breakdown of the study population by age group surveyed individuals for assessing the quality of life in toothless adults in Ndé Division of Cameroon.

This figure above shows us that the age group most represented in our study population is that of 30-50 years is 393 (37.2%).

Distribution of the study population by occupation

The figure below illustrates the different professional activities carried out by the study population.

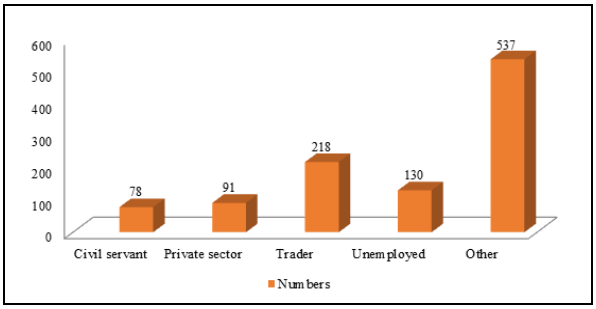


Figure 3: Distribution of the study population by occupation in toothless adults in Ndé Division of Cameroon.

It appears that people in other occupations (informal sector) followed by traders form the critical mass of this study. Civil servants were the least represented profession.

Distribution of the study population by marital status

With regard to the civil status of the people surveyed, the following figure reveals the trends in the results.

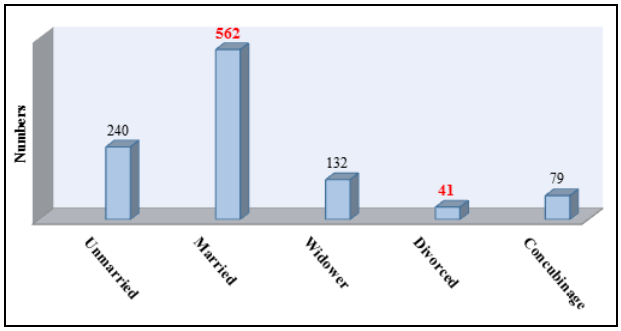


Figure 4: Distribution of the study population by marital status in toothless adults in Ndé Division of Cameroon.

More than 562 (50%) of the investigated individuals were married, divorced women accounted for only about 41 (4%) of the sample, singles and widowers respectively 240 (23%) and 132 (12.5%).

Distribution of population by level of study

The level of education of the respondents is shown below:

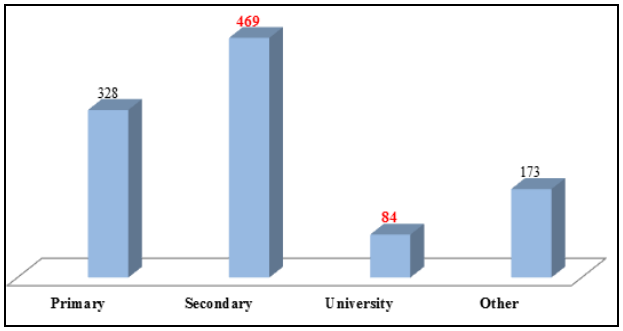


Figure 5: Distribution population by level of study in toothless adults in Ndé Division of Cameroon.

The majority of surveyed people had a post-secondary education. About 469 (44.5%) of individuals had at least a high school education and 328 (31%) had a primary level compared to only 84 (8%) of those with higher education. The others are the illiterates who represent 173 (16.4%).

THE AETIOLOGIES OF THE EDENTULISM

The causes of toothlessness among the respondents are summarized in the table below.

Table II: Frequency of aetiologies of dental losses in toothless adults in Ndé Division of Cameroon.

Aetiologies of dental losses	Numbers	Percentage (%)
Caries	755	71.6
Periodontal Disease	118	11.2
Trauma	**104**	**9.87**
Therapeutic extraction	0	0
Others (agenesis, irradiation, tumour and allergy)	**13**	**1.23**
Caries and periodontal diseases	**27**	**2.56**
Caries and trauma	**37**	**3.53**
TOTAL	1054	100

More than two-thirds of our sample had tooth decay, a percentage of 755 (71.6%), followed by periodontal disease 118 (11.2%).

THE RISK FACTORS OF EDENTULISM

With regard to the factors exposing our respondents to the missing teeth we obtained the elements in the table below:

Table III: Risk factors of edentulism adults in the Ndé Division of Cameroon.

Items	Risk factors	Numbers	Percentages (%)
Dentist's consultation	No	481	45.6
Oral hygiene	**Bad hygiene**	**666**	**63.15**
Toothache or untreated gums	Yes	543	51.5
Lack of information	Yes	178	16.9
Lack of money	Yes	538	51

The dominant risk factor is poor hygiene 666 (63.15%), associated with dental pain and gingival or 543 (51.5%).

THE CONSEQUENCES OF EDENTULISM

The consequences of edentulous are summarized in the table below.

Table IV: The consequences of edentulism in toothless adults in the Ndé Division of Cameroon.

Consequences of edentulism		Numbers	Percentages %
Unsatisfactory dental appearance (aesthetic)		597	56.6
Digestive disorders		289	27.4
Functional limitation (difficulty chewing)		417	39.5
Previous amendment		395	37.5
Dysfunction of the medullary temporal articulation (MTA)	Pain in the MTA	76	7.22
	Slam	91	8.64
	Slamming with pain	33	3.13
Psycho-social disorders	To feel uncomfortable	357	33.87
	To worry	263	24.95
	Difficulty of relaxing	86	8.15
	To be disturbed	202	19.16
	Feeling embarrassed	83	7.87
	Less satisfying life	252	23.90
	Unable to enjoy each other's company	57	5.40
Occlusion peer loss	[0-2]	99	9.39
	[3-4]	62	5.88
	[5-7]	268	25.43
	[8-10]	625	59.30

The major consequence is the loss of aesthetics with 597 (56.6%), followed by the difficulty to chew with 417 (39.5%) and feeling uncomfortable is 33.87%.

CLINICAL CHARACTERISTICS OF EDENTULISM

Table V: Clinical characteristics of edentulism in toothless adults in Ndé Division of Cameroon.

Types	Numbers	Percentages (%)
Partial	**1006**	95.4
Total (bimaxillary)	13	1.23
Partial-total (mixed)	35	3.32
Kennedy Score		
Unclassified	700	66.41
Class 1	24	2.3
Class 2	101	9.58
Class 3	80	7.59
Class 4	12	1.13
Class 5	**137**	12.99
According to the location of the breach		
Previous	161	15.2
Posterior	**630**	59.8
Antero-Posterior	263	25
According to the arcade **Maxillary** **Mandible**	 278 373	 26.4 35.4
Maxillary-Mandible (mixed)	**403**	38.2
Depending on the nature of the breach		
Unitary	**636**	60.5
Average	68	6.45
Short	221	21
Long	129	12.05
According to the unilaterality of the breach		
Unilateral	507	48.1
Bilaterality	**547**	51.9
According to the position of the breach		
Recessed Free Recessed-free	**671** 171 212	63.7 16.2 20.1

Almost all of the study population had a partial toothlessness 1006 (95.4%), the other types of missing teeth accounted for about 4% of the sample. Regarding the Kennedy classification, about 700 (66.41%) of the participants could not be classified. Of the individuals classified about 137 (12.99%) were in class (5). The location was more posterior to 630 (59.8%), the mixed arcade being the majority at 403 (38.2%), followed by the unitary nature of the breach at 636 (60.5%), the bilateral gap shown was at 547 (51.9%), with a recessed position at 671 (63.7%).

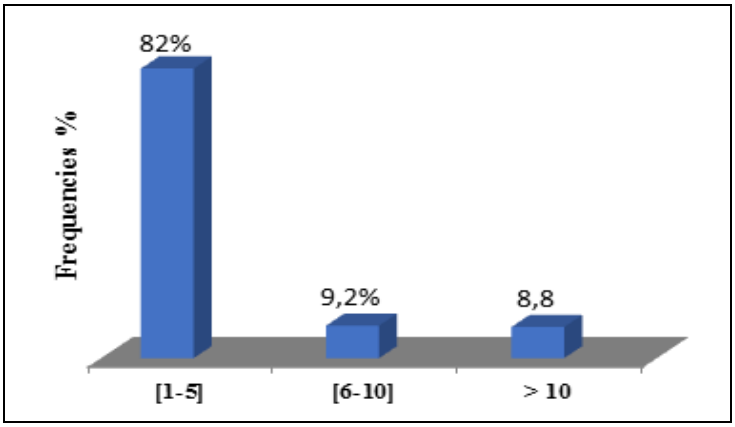


Figure 6: Frequency of number of missing teeth in toothless adults in Ndé Division of Cameroon.

Breaches with 1 to 5 teeth are the most frequent, 864 (82%).

PROSTHETIC REHABILITATION

Concerning the knowledge, the wearing of prosthesis in the study population, and the different reasons for the lack of prosthetic oral rehabilitation in the Ndé, Table VI below groups together the answer elements.

Table VI: Prosthetic rehabilitation in toothless adults in Ndé Division of Cameroon.

Prosthetic rehabilitation		Numbers (n=1054)	Percentages (%)
Knowledge of prostheses	**Yes**	**762**	**72.3**
	No	292	27.7
Prosthesis wearer	**Yes**	**56**	**5.31**
	No	998	94.7
Need for dental replacement by prosthesis	**Yes**	**758**	**71.9**
	No	296	28.1
Reason for lack of dental replacement by prosthesis			
Lack of information on replacement	Yes	178	16.9
	No	876	83.1
Lack of money	Yes	**538**	51
	No	516	49
Presence of discomfort	Yes	113	10.7
	No	**941**	**89.3**
Fear of the Dentist-Dentist	Yes	9	0.854
	No	1045	99.1
Discouragement	Yes	51	4.84
	No	1003	95.2

This table presents the characteristics of the population investigated. Approximately 95% of the sample did not wear a prosthesis, compared with 56 (5.31%) prosthetic wearers, 762 (72.3%) knew the prosthesis, 758 (71.9%) expressed the need for replacement of the prosthesis, and the main reason for the lack of dental replacement by the prosthesis being: no discomfort at 941 (89.3%) followed by lack of money at 538 (51%).

Distribution of prosthesis wearers by sex and type of edentulism

The toothless 56 denture wearers are listed in the table below:

Table VII: Distribution of prosthesis wearers by sex and type of toothless gap in toothless adults in Ndé Division of Cameroon.

Types	Gender		Total
	Female	Male	
Partial toothless	23 (46%)	**28 (54%)**	**51 (91.08%)**
Mixed toothless	1 (50%)	1 (50%)	2 (3.57%)
Total toothless	1 (33,3%)	2 (66.7%)	3 (5.35%)
Total	25 (44,6%)	31 (55.4%)	56 (100%)

Numbers are followed by percentage in brackets, n=1054

According to Table VII above, we have 56 prosthetic wearers; the majority consists of partial toothless 51 (91.08%) and males 28 (54%).

IMPACT OF EDENTULOUS ON THE QUALITY OF LIFE

We worked with the median because the data was not normally distributed. Overall, the median OHIP score 14 in the study population was 12 (95% CI, lower and upper bounds between 15.5 and 17) indicating a fairly good quality of life for the respondents.

Table VIII: Overall distribution of scores per OHIP-14 item.

Items	N	Lower bound	Median	Upper bound
Functional limitation				
Trouble pronouncing words	1054	2.0	0	2.5
Difficulty chewing	**1054**	**2.5**	**2**	**3.0**
Discomfort to eat	1054	2.5	2	2.5
Insufficient food	1054	2.5	1	2.5
Pain and physical disability				
Pain points	1054	2.5	1	2.5
Avoid smiling	1054	2.0	0	2.5

Difficulties to work	1054	1.5	0	2.0
Psychological and social incapacity				
To feel uncomfortable	1054	2.5	1	2.5
To worry	1054	2.5	1	2.5
Difficulties to relax	1054		0	2.0
To be disturbed	1054	2.0	0	2.5
Feeling embarrassed	1054	2.0	0	2.5
Less satisfying life	1054	2.0	1	2.5
Unable to enjoy the company of others	1054	2.0	0	2.0

We present the median scores on scales from 0 to 4 and their 95% confidence intervals. The median scores in Table VIII vary between 0 and 2 and all the values less than 3 indicate a relatively good quality of life for each item. The difficulty in chewing is the dominant impact, which is an upper limit of 3.

Prevalence of responses "quite often or very often" for each response from OHIP-14

This figure allows us to visualize and locate the impact of toothless gap on the life of our toothless population.

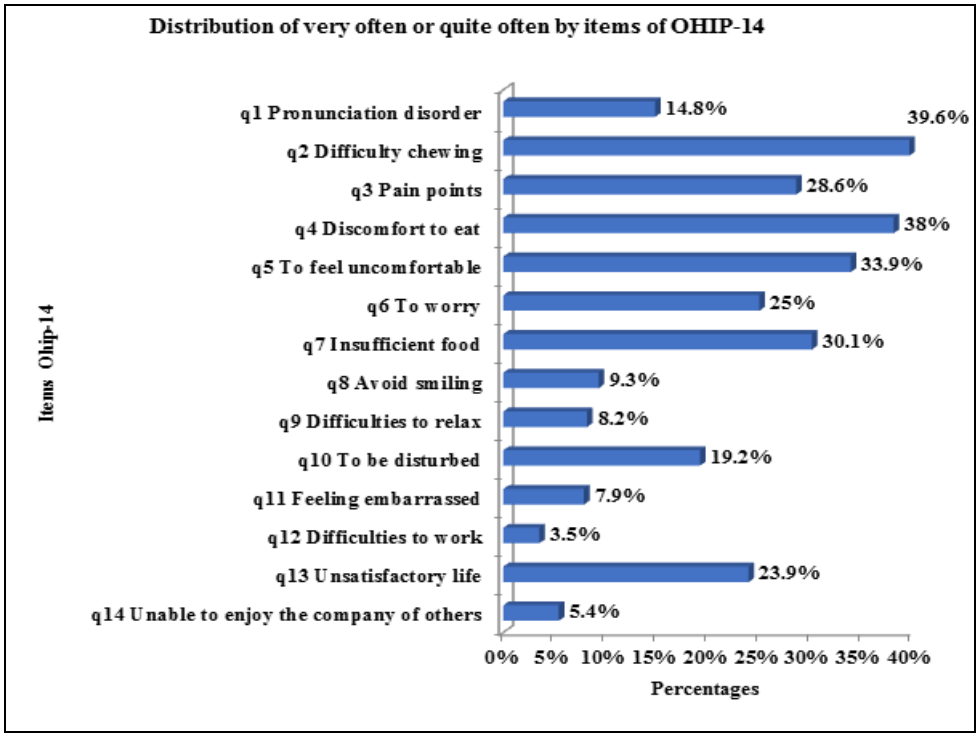


Figure 7: Prevalence of responses very often or quite often OHIP-14 in toothless adults in Ndé Division of Cameroon.

According to the different items in OHIP-14 the main complaints were difficulty to chew, discomfort to eat, general discomfort and insufficient nutrition. The lowest were.

Specific assessment of the quality of life in the toothless
Age, number of lost teeth, number of occlusion pairs and cumulative quality of life score.

Table IX: Correlation between quantitative variables and OHIP-14.

Variable	Coefficient of correlation (r)	P value
Age	0.15	<0.001
Number of lost teeth	0.4	<0.001
Number of occlusion pairs	-0.34	<0.001

There is a low positive monotonic correlation between age and OHIP-14 ($r = 0.15$, $p < 0.001$), and the number of lost teeth and OHIP-14 ($r = 0.4$; 0.001). On the other hand, there is a negative monotonic correlation between occlusion number and OHIP-14 ($r = -0.34$, $p < 0.001$).

Sex and cumulative score of OHIP-14

The table below illustrates the relationship between sex and quality of life

Table X: Distribution of the cumulative OHIP-14 score by gender in toothless adults in Ndé Division of Cameroon.

Gender	N (1054)	Median	Lower bound	Upper bound	P-value
M	664	12	**15**	17.5	0.96
F	390	13	**15**	17.5	

The quality of life is the same for both sexes, the association is not significant. But women have a slightly higher severity than men.

Marital status and cumulative score of OHIP-14

Table XI allows us to assess the relationship between quality of life and marital status.

Table XI: Cumulative score of OHIP-14 and marital status in toothless adults in Ndé Division of Cameroon.

Variable	N (1054)	Median	Lower bound	Upper bound	P value
Marital status					0.009
Unmarried	**240**	**8,0**	13.0	16.5	
Married	**562**	13,0	15.0	17.0	
Widower	**132**	**15,5**	**16.5**	**21.5**	
Divorced	**41**	10,0	10.5	19.0	
Concubinage	**79**	**15,0**	15.0	21.0	

The association is significant between OHIP-14 and marital status, showing a high quality of life among widowed and cohabiting couples and a low quality of life among single people.

Aetiologies, risk factors, consequences of edentulism and the cumulative score of OHIP-14

The relationship between quality of life and aetiology, risk factors and the consequences of toothless gap on the daily lives of patients is summarized in the table below:

Table XII: Distribution of cumulative OHIP-14 scores with the aetiologies, risk factors and consequences of edentulism.

Variable	N (1054)	Median	Lower bound	Upper bound	P-value
Dentist consultation					0.38
Edentulous Aetiology					<0.001
Caries	**755**	11	14.5	16.0	
Periodontal Disease	**118**	**19**	19.0	24.5	
Trauma	**104**	10	11.0	16.5	
Other (agenesis, irradiation, allergy and tumour)	**13**	6	3.5	24.5	
Caries and periodontal diseases	**27**	**22**	**19.5**	**28.5**	
Caries and trauma	**37**	15	12.5	21.5	
Toothache or gums					<0.001
Yes	**543**	16	17,5	19,5	
No	**511**	8	12,0	14,5	
Perception of oral hygiene					<0.001
Very good	**29**	1	2.5	9.5	
Good	**359**	7	1.5	1.0	
Bad	**666**	16	1.5	2.0	
Digestive disorders related to teeth					<0.001
Yes	**289**	18	**19.0**	22.0	
No	**765**	10	13.5	15.5	
Digestive disorders related to teeth					<0.001
Very satisfied	**81**	2	7	11.5	
Satisfied enough	**376**	5	9	11.0	
Unsatisfied	**597**	**18**	**19**	21.0	

The association is significant between OHIP-14, aetiologies of edentulism, digestive disorders, toothache or gums, oral hygiene and appreciation of dental appearance (P<0.001), while OHIP-14 is not significant with the dental consultation (P = 0.13). The poor quality of life is found in the toothless having for aetiology caries and periodontal disease associated with a median of 22.

Clinical features of edentulism and the cumulative score of OHIP-14

The table below depicts the relationship between quality of life and the different characteristics of edentulism.

Table XIII: Distribution of cumulative OHIP-14 score and clinical features of edentulism.

Variables	N (1054)	Median	Lower bound	Upper bound	P-value
Types of toothless gap					<0.001
Partial	**1006**	11	14.5	16.0	
Total	**13**	**30**	24.5	39.5	
Partial-total	35	**31**	**24.5**	**33.5**	
Kennedy score					<0.001
Unclassified	**700**	11	14	16	
Class 1	**24**	12	10	19	
Class 2	**101**	5	10.5	15.5	
Class 3	**80**	14	14	19	
Class 4	**12**	11,5	6	23	
Class 5	**137**	24	22	26.5	
Location of the Breach					<0.001
Anterior	**161**	8	11.5	15.5	
posterior	**630**	10	13.5	15	
Anteroposterior	**263**	20	20.5	24	

There is a significant association between OHIP-14, the types of edentulism, the Kennedy score and the location of edentulism. Higher quality of life is observed in mixed edentulism followed by total toothlessness.

Table XIV*:* Distribution of cumulative OHIP-14 score and prosthetic oral rehabilitation.

Variables	N (1054)	Median	Lower bound	Upper bound	P-value
Knowledge about the prosthesis					0.99
Yes	**762**	12	15	17.0	
No	**292**	12.5	15	18.5	
Prosthesis carrier					0.13
Yes	**56**	**8.0**	10,5	18.5	
No	**998**	12.5	15,5	17.0	
Need prosthesis					<0.001
Yes	**758**	16	17	19	
No	**296**	**4**	9	11	
Lack of information about replacement					<0.001
Yes	**178**	15	16.5	20.5	
No	**876**	11	15.0	16.5	
Lack of money					<0.001
Yes	**538**	16	17.5	19.5	
No	**516**	8	12.0	14.5	
No discomfort					<0.001
Yes	**113**	6	10.0	14.5	
No	**941**	13	15.5	17.5	

The association is significant between the OHIP-14, the need for prosthesis, the lack of information, the lack of money and no embarrassment with the edentulous whereas this association does not show any significance with the level of knowledge on the prosthesis and prosthesis wearing. It is observed a rather good quality of life with the carriers of prostheses than with the non-carriers, and also a very good quality of life in those not expressing a need for prosthesis.

Assessment of the dissatisfaction / satisfaction of partial, mixed, total toothlessness

Prosthetic wearers

The tables below evaluate the types of toothless gap on the criteria of dissatisfaction and satisfaction.

Table XV: Distribution of the frequency of dissatisfaction / satisfaction among partial toothless people.

ITEMS-OHIP-14	Dissatisfaction N (%)	Satisfaction N (%)
Functional limitation	**285 (28.1%)**	**721 (71.66%)**
Pain and physical disability	**131 (13.5%**)	874,6 (86.9%)
Psychological and social incapacity	**157 (15.6%)**	**848,5 (84.35%)**

Report dissatisfaction / satisfaction = 4 which shows that out of 5 partials toothless, 4 are satisfied. The physical satisfaction is highest among the partials is 874.6 (86.9%).

Table XVI: Distribution of Dissatisfaction / Satisfaction Frequency among Partial-Total (Mixed) Toothless.

ITEMS-OHIP-14	Dissatisfaction N (%)	Satisfaction N (%)
Functional limitation	**28.25 (80.71%)**	6.75 (19.28%)
Pain and physical disability	4.33 (33.33%)	8.66 (66.66%)
Psychological and social incapacity	13.85 (39.39%)	21.14 (60.40%)

The dissatisfaction / satisfaction ratio equals 1: it can be deducted that 1 in 2 mixed edentulous is satisfied with his toothless. The table shows that the mixed toothless is at 28.25 (80.71%) dissatisfied at the functional level.

Table XVII: Distribution of the frequency of dissatisfaction / satisfaction among total edentulous (bimaxillary).

ITEMS-OHIP-14	Dissatisfaction N (%)	Satisfaction N (%)
Functional limitation	**9,5 (73.07%)**	3,5 (26.93%)
Pain and physical disability	9,66 (27.61%)	25,33 (72.38%)
Psychological and social incapacity	13,85 (39.39%)	21,14 (60.40%)

The dissatisfaction / satisfaction ratio equals 1, indicating that there is equality of satisfaction among the total toothless. The table also shows that the major dissatisfaction of the totals is the functional limitation to 9.5 (73.07%).

Table XVIII: Distribution of the frequency of dissatisfaction / satisfaction among toothless patients with prostheses.

ITEMS-OHIP-14	Dissatisfaction N (%)	Satisfaction N (%)
Functional limitation	13.25 (23.66%)	42.75 (76.33%)
Pain and physical disability	5.66 (10.12%)	**50.33 (89.88%)**
Psychological and social incapacity	8.28 (5.05%)	47.71 (85.20%)

The dissatisfaction / satisfaction ratio equals 5, suggesting that out of 6 prosthesis wearers, 5 are satisfied. All OHIP items are satisfactory and the highest score is physical 89.88%.

Some images taken by us during the collection of data, illustrative of different types of edentulous are grouped below.

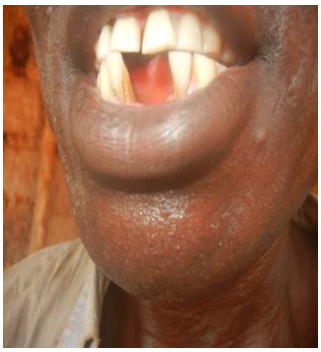
Posterior partial edentulous (Bazou)

Partial anterior edentulous (Bassamba)

Mixed edentulous (Bangoulap)

Mixed partial edentulous (Bangangté)

Total edentulous (Ndipta III)



Partial edentulous bearing prosthesis (Bassamba)

Mixed edentulous prosthesis wearer

Total prosthesis (Tonga)

Total edentulous prosthesis carrier

DISCUSSION

We recruited 1.054 people, the male gender being dominant at 664 (63%), compared to female 390 (37%). This high male representation could be justified young people are more active, with different firstly by the fact that during data collection men were more cooperative and accessible than women. Secondarily one can think of men who are of retirement age gradually leaving cities (leaving women still active and children in school) for the villages. Regarding age, the 30 to 50 age group was the most represented 393 (37.2%). It can be explained by the fact that our edentulous population consists mainly of

young adults. Moreover, it is the age group where there are many young people who are more active, with different responsibilities; therefore the priority of people of this age group may not be oral hygiene hence the high frequency of edentulous cases. Similarly, our study population was dominated by married couples 562 (53.3%), followed by non-engaged living such as; singles at 240 (22.8%), widowers at 132 (12.5%), concubine at 79 (7.5%) and divorced at 41 (4%). Agriculture being the main activity in the villages, they need to get married quickly so they can help each other in farming activity: a partner represents an additional labour. The significant loss of teeth among married couples is the consequence of the negligence of oral hygiene because, these couples come out very early in the morning to go to their field work and are more careful about their teeth only in case of pain reported by a painful toothache.[9] It can be also because married people are less minded about seducing their partners, therefore they pay less attention to personal hygiene including oral care.

The leading cause of edentulism was caries 755 (71.6%) followed by periodontal disease 118 (11.2%) and trauma 104 (9.87%). Our results are consistent with those of Fure conducted in 2003 in which tooth decay is the main reason for dental extractions followed by periodontal disease.[10] Indeed, the prevalence of tooth decay is high in underdeveloped countries because of the lack of knowledge of dental brushing methods, and the lack of regular check-ups among oral health professionals. The lack of financial resources of the majority of the population is a key element that prevents patients from consulting health professionals in general and the dentist in particular. As a result, tooth extraction appears to be a less expensive and effective alternative to this treatment than conservative treatment.[11]

In addition to the "purely pathological" factors related to dental diseases, a significant influence of factors related to demography, socio-economic status, level of training and individual behaviour (smoking habits, hygiene habits, consultations with the dentist) is no longer to be shown as risk factors for toothless gap.[12] The poor oral hygiene is the most represented in population surveyed in this study (63.15%) followed by dental pain and gingival 543 (51.5%). This is due to non-compliance with adequate methods of oral hygiene. This result confirms Pouyssegur *et al* study conducted in 2010 in which they indicated that the increase in dental pathology of the elderly results from the poor quality of oral hygiene.[13]

Our results showed that the consequences are in descending order mainly represented as follows: aesthetic 597 (56.6%), functional with difficulty to chew 417 (39.5%) and psycho-social with feeling uncomfortable 357 (33.8%). The previous missing tooth affects the aesthetic a lot, creating a psycho-social disorder in these toothless people when they are in public circles. This psycho-social disorder also affects singles in the conquest of a spouse or the toothless making music and people in positions of responsibility forcing them to hold a few times public speeches. The appearance being the passport of women when looking for a partner, they are the most affected by the aesthetic disorder. The difficulty in chewing can be justified by the disturbance of occlusal balance thus creating discomfort during the diet.[14]

Almost all of our study population consisted of partial edentulous at 1006 (95.4%). This is due to neglected tooth decay and periodontal disease without proper care, poor hygiene in the elderly, bad behavioural habits such as smoking of cigarettes or traditional-made tobacco, application of the barks in the dental cavities as traditional medicine treatment. These elements are the basis of partial or total dental losses.[15]

Out of 1054 people in our sample, 762 (72.3%) knew of the prosthetic treatment, 56 (5.31%) had prosthesis and 758 (71.9%) had expressed the need for prosthetic oral rehabilitation. Edentulous with posterior localization were predominant and did not constitute discomfort or handicap (89.3%). It should be noted that our study population complained of the very high cost of the prosthesis, and the lack of qualified personnel in local healthcare facilities for prophetic rehabilitations. This result agrees with the findings of Khady conducted in Dakar, which shows that more than half of its study population felt the need for dental prosthetic rehabilitation.[1]

We obtained 56 prosthetic wearers, the majority of whom were partial toothless 51 (91.08%) among which male represented 28 (54%). This can be due to the major presence of partial toothless married men in our study population and the fact that many previous partial ones compensated for aesthetic reasons.[16]

Overall, the median OHIP score in the population was 12 (95% confidence score, on a scale of 0-56) indicating a fairly good quality of life for the participants. This could be explained by a psychological adjustment of our population with their edentulism, and because for the elderly, the loss of teeth was perceived as a consequence of aging and therefore, it seemed to have little or no impact on their quality of life. This result is consistent with the hypothesis of Mayunga *et al* where, the average severity was low or 11.67 "on a scale of 0 to 56", showing that the Congolese population was not too affected by the absence of teeth.[17]

The quality of life of 1054 partial or total edentulous people in the Ndé division was assessed using 14 questions from the Slade study according to functional, physical and psycho-social aspects. Table VIII shows that the overall quality of life is significantly good and the difficulty in chewing is the predominant impact of toothless gap on quality of life being a lower bound of 2.5 and greater than 3, the difficulty in chewing was

39.6%. This result may be related to the decrease in masticatory function, which is the major concern of posterior partial edentulous, and totals. The number of occlusion pairs is substantially reduced, and chewing becomes difficult. This situation sometimes causes the concerned individuals to interrupt their meal. This study corroborates with the report of Mayunga *et al* conducted in DR Congo in which difficult chewing was the most reported complaint in toothless patients with a frequency of 39%.[17]

According to the various difficulties encountered in the field, the main complaints of patients were successively: "The difficulty in chewing is (39.6%), the discomfort in eating (38%), the fact of feeling uncomfortable at one or the other (33.9%) and insufficient nutrition (30.1%)". This could be explained by the fact that edentulism has a direct link with masticatory function and psychology. Our result is different from that of Mayunga *et al* where the main complaints were; difficulty chewing, worry, discomfort, and feeling unwell. This difference in result may be due to the fact that we have considered in our study the partial edentates, mixed, the total bilateral edentulous and the carriers of prosthesis, while Mayunga *et al* study was limited to the partial toothless non-carrying prosthesis.[17]

No significant relationship was found between OHIP and sex. Nevertheless, women had a higher severity than men, reporting a poorer quality of life related to edentulism than men. This could be because women are more concerned about their oral health and perceive negative impacts more. This result agrees with the findings of Mayunga *et al* in DR Congo and Lathi *et al* in Finland.[17,18]

Age significantly influences the quality of life of toothless people. The number of lost teeth increases with age, and the pairs of occlusions decrease with increasing age. The correlation is strong between the OHIP and the edentulous patient of at least 4 teeth and that having no pair of occlusions. This outcome corroborates with the conclusions of Ghani in Pakistan, where it shows that there is a relationship between age and quality of life related to oral health with a poor perception of subjective oral health in older subjects.[7]

The profession and the level of education have no significant influence on the quality of life of the toothless, but the marital status has a very significant influence on the quality of life of our edentulous population, widowers being the most affected. This could be explained by loneliness, sadness, the heavy responsibility to assume alone. All this can affect oral hygiene and become cause of edentulism. This result corroborates with that of Rodrigue *et al* conducted in Brazil in 2012 in which, social participation can have a positive effect on the quality of life of older people, as it provides a social support system that helps to minimize feelings of loneliness and of abandonment.[19]

Toothless patients with aetiology associated tooth decay and periodontal disease had a high OHIP score. This could be attributed to the combined action of the two diseases most responsible for dental losses.[20]

Partial-total (mixed) missing teeth showed the highest OHIP score (median = 31) among all the edentulous and a significant P-value, which highlights a worse quality of life in this group than in the remain of others toothless. This could be justified by the psychological impact of edentulism depends on their location, extent, functional or aesthetic importance. The frequency of dissatisfaction and satisfaction shows that the partial toothless had a very high frequency of satisfaction on all OHIP-14 items, thus presenting a fairly good satisfaction on the physical and psycho-social level. This could be justified by the fact that they still have several teeth in occlusion allowing them to satisfy the functional and aesthetic needs.[21]

The majority of the mixed edentulous showed a dissatisfaction which is very dominant at the functional level is 80.71%, on the other hand, they are satisfied on the physical and psycho-social level. This result could be explained by the loss of occlusion, the chewing that is done between the number of teeth remaining on the one hand and the gum on the other hand may be responsible for pain in the mouth, and limiting the consumption of some In terms of satisfaction, our study corroborates that of Nguessan *et al* conducted in Ivory Coast in which the majority of total and subtotal toothless were in the perceived positive psychological trait such as merry and friendly.[22]

Most of the total toothless had functional dissatisfaction at 73.07% and had a slight satisfaction on the physical and psycho-social level. This could be explained by inadequate chewing with the gums, forcing them to choose which foods to consume. This observation aligns with those of Nguessan *et al*. where tooth loss can affect an individual's ability to interact with others and can have a considerable impact on their lifestyle by causing depression, sadness, loneliness and isolation.[19,22] The majority of prosthetic wearers responded positively to all OHIP-14 questions. This is a sign of a very good quality of life, suggesting that the prosthesis strongly contributes to restore the "functional, physical, psychological and social" balance of the toothless. There is also an improvement in self-image and self-esteem following the incorporation of partial, mixed, and completes removable prostheses. The recovery of aesthetics is the gateway to the return to social activities. Patients have felt "complete" again, but still feel weakened because removable rehabilitation is an alternative, but should not be considered a better solution. Because the definitive and durable treatment of toothless gap is implant-borne.[23]

CONCLUSION

This study revealed that the main aetiologies of edentulism are tooth decay and periodontal disease. The quality of life was poor in the edentulous person with the two associated causes. Lack of hygiene is the main risk factor, followed by loss of aesthetics as the predominant consequence. The dominant age group is 30 to 50 years, with the youngest being 18 years old and the oldest 120 years old. With age, quality of life deteriorates. It is bad in edentulous people in the Ndé division, and the main complaints are at the functional and psycho-social level. However, mixed edentulous patients had the worst OHIP-14 score followed by total edentulous patients at the functional level. The general complaint for any type of deficiency is the difficulty in chewing food, resulting in poor nutrition and a poor quality of life. Therefore, having natural and healthy teeth remains a better solution for a better quality of life because the loss of a dental organ, even if compensated by wearing a prosthesis, does not always contribute to a good quality of life. What lesson can we get from this study? What can be the implication?

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