

## Epidemiologic descriptive study of edentulous patients and their socio-demographic factors in Bamako: Population of 1313 case

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**ABSTRACT:** *Introduction:* The aging of the society goes together with the rising of the number of the edentulous people and so with the wearing of removable prosthesis Our study is an epidemiologic descriptive type having collected 1313 patients, carried out over a period going from December 2nd, 2012 to June 28th, 2014 at the university hospital center of odontostomatology of Bamako.

The aim of our study, is to analyze the increasing number of edentulous people observed and its link to sociodemographic factors and life quality, among a population consulting for a removable prosthesis.

*Methods:* we conducted an epidemiologic descriptive study from December 2<sup>nd</sup> 2012 to October 28 2014. We enrolled 1313 patients Using questionnaires and the variables studied were gender, age, occupation, level of education, reason for consultation, causes of edentulism, types of edentulousness, wearing of prosthesis.

The statistical analysis of the data was carried out with the software SPSS N ° 12 French version. Statistical calculations were performed with Pearson's Chi2 with a risk  $\alpha \leq 0.05\%$ .

*Results:* In the population involved, the female gender accounted for 60.6% with a sex ratio of 0.65. Removable prosthetic rehabilitation mainly concerned young adults aged 25-34 (20.2%). Dental pain was the main reason for consulting patients with 52.9% of cases.

Dental caries and its complications were the main cause of toothlessness with 69.8% of cases.

There was a significant statistical link between the reason for consultation (dental pain or aesthetics) and the occupation of housewives ( $P \leq 0.05$  Chi2 validated). Restoration of function concerned the retired people.

There was a significant statistical relationship between age groups 25-34 years and partial edentulousness ( $P \leq 0.05$  Chi2 validated) as well as between total edentulism and age group 75 years and over ( $P \leq 0.05$  Chi2 validated).

Edentulous patients who never had a denture accounted for 89.0% of cases.

*Conclusion:* A large part of the population had incomplete dentition. Our study showed descriptively a predominance of female sex with 60.6%. The most represented age group was 25-34 years old with 20.2%. Dental pain was the main reason of consultation with 52.9%.

Edentation is still a real problem in our society.

**KEYWORDS:** Restoration, Edentation, Prosthesis, Removable, sociodemographic factors.

### 1 INTRODUCTION

The aging of the society goes together with the rising of the number of the edentulous people and so with the wearing of removable prosthesis.

According to the National Institute of Statistics and Economic Studies (INSEE France) in 2004, a study on the population projection in 2050 shows that an inevitable aging of this population is predictable: 32% of the population would be 60 years

old or older with or without prosthetic rehabilitation and the expectation of life at birth would be 84 years for men and 89 years for women with a huge loss of teeth [1].

Confronting a wide elderly population, in terms of the health difficulties, not only their physical or psychological health but also their life quality has become a major public health alarm.

The interest of this subject lies in the fact that:

- Edentation status is a real state of infirmity.
- It causes a harm to physiological functions characterized by dysfunction and disorder of chewing and phonation and all the functions of the manducatory system.
- Edentation can lead to dysfunctions that may have consequences on the general health of the toothless individual.

The rate of increasing tooth extraction (from 13.23% to 19.37%) is caused mainly by dental decay [2].

- The non-rehabilitation of the teeth loss in patients is nowadays a major public health problem.

The aim of our study, at the University Hospital Center of Odontostomatology of Bamako (UHC-OS), is to analyze the increasing number of edentulous people observed and its link to sociodemographic factors and life quality, among a population consulting for a removable prosthesis.

Materials and Methods:

The study was conducted in the University Hospital Center of Odonto Stomatology (UHC-OS) of Bamako (MALI).

- Type and duration of the study:

This is an epidemiologic descriptive study from December 2nd 2012 to October 28, 2014.

- The sampling:

Our sample consisted of 1313 patients, ie 517 men and 796 women.

- Patient enrollment:

Recruitment was done accidentally at the two Odontology and Stomatology departments. During the study 4489 patients were consulted, including 1313 edentulous patients who met the inclusion criteria.

Criteria of inclusions: Included in this study was any patient aged 15 to 75 years or older, who had consulted for a toothlessness and who accepted the management of the removable prosthetic restoration.

Exclusion Criteria: Excluded from our study were any patients who came for consultation other than those mentioned above.

- Materials:

- Instrument tray for the endobuccal examination: the mirror, the tweezer, the probe.
- Information sheet.

- Study of the variables: The study variables were:

- Sex, age, occupation, level of education, reason for consultation, causes of edentulism, types of edentulousness, wearing of prosthesis.

- Analysis and statistical calculations of the data: The analysis of the data was carried out with the software SPSS N ° 12 French version. Statistical calculations were performed with Pearson's Chi2 with a risk  $\alpha \leq 0.05\%$ .

## 2 DISCUSSION

### 2.1 SOCIO-DEMOGRAPHIC ASPECT

- Gender:

In our study females accounted for 60.6% of cases with a sex ratio = 0.65. GAILLARD H; GAILLARD A in Paris, found 52.7%. The sex ratio was 1.59 [3].

- Age:

The 25 to 34 age group was represented with 20.2% of patients in our study Steele J.G. and al. found a rate of 61.5% between 1993 and 1995 in their study in the UK [4].

*Table 1. Distribution of patient population by age*

Age	Number	Frequency (%)
15-24 ans	252	19,2
25-34 ans	265	20,2
35-44 ans	236	18,0
45-54 ans	219	16,7
55-64 ans	140	10,7
65-74 ans	161	12,2
75 ans ou +	40	3,0
Total	1313	100,0

*The most represented age groups were those aged 25-34 (20.2%)*

- Level of education and occupation:

Many of our patients were out of school and accounted for 50.4%. Only 9% had a higher level of education. Housewives accounted for 25.2% of cases.

*Table 2. Distribution of patients by level of education*

Level of education	Number	Frequency (%)
None	662	50,4
Primary	293	22,3
Secondary	240	18,3
Higher education	118	9,0
Total	1313	100,0

*The unschooled and illiterate people represented 50,4% of the population studied.*

N'GUESSAN K and all found in 2009 in Ivory Cost, that 22% had a higher level; and housewives accounted for 28% [5].

### 2.2 EPIDEMIOLOGICAL ASPECT:

- Reasons for consultation:

In this work we noted that 52.9% of patients consulted for dental pain, 24.5% for aesthetics and 12% for function restoration.

Gaye M. in Dakar in 2011 had found 49.97% of patients who had consulted for dental pain. While 37.3% consulted for dental esthetics and 12.73% for chewing needs. The patients consulting for dental pain are always dominant because the notion of pain is an uncomfortable and unbearable sensation [6].

**Table 3. Distribution of patients by reason of consultation**

Motif	Number	Frequency (%)
Dental pain	694	52,9
Aesthetic	319	24,3
Fucntion "chewing"	158	12,0
Other	142	10,8
Total	1313	100,0

\* Other: Bad breath, Mandibular fracture, Referral by a treating physician accounted for 10.8%

Dental pain was the dominant reason for our consultations with 52, 9% of cases.

- Causes of edentulism:

During our work, dental decay and its complications remained the main cause of toothlessness in all age groups of patients, 70% of the causes. Other causes such as dental trauma affecting the age groups of 15 -54 years were represented with 6.54% of patients. Those related to periodontal diseases were found in 9.52% of patients aged 55-75 years or older.

**Table 4. Distribution of patient by cause of edentation**

Cause	Number	Frequency (%)
Decay and complications	917	69,8
Dental trauma	215	16,4
Periodontal disease	125	9,5
Other	56	4,3
Total	1313	100,0

\* Other: Mandibular / maxillary tumor, Non-specific causes related to traditional dentistry practice: 4.3%

The main cause of edentation in our patients was tooth decay and its complications in 69.8% of cases.

In the rest of the world, tooth lessness is linked to several factors in a significant way: age, sex, socio-economic and clinical level.

In France, the evolution of causes related to edentulism was determined by age during the period 1993-95. Patients aged 35-44 years have few missing teeth with 16.3%, while patients aged 65-74 years have missing tooth components with 83.7% [7].

A study conducted in Dakar in 1994 and 1995 studied the prevalence of caries in adults aged 35 to 44 years showed that:

- The decay rate is higher in edentulous patients with 57.32% and a rate of 7.11% observed in patients with complete dentition
- Low-income or lower-education individuals have more missing teeth

In the United States, a study conducted between the years 1988 and 1991, on people aged 18 and over, demonstrated that [8] :

- The number of teeth decreases with advancing age, only 2% of individuals have retained all their teeth in the 75 years and older (67.4% among 1824 years). In general, tooth decay is the major cause of toothlessness as reported in the studies above. Our study agreed with these findings.

- Number of missing teeth:

In our study, the number of teeth missing from one to four teeth was found in the 15 years - 24 years of patients at the maxillary level with 38.4%. An absence of large numbers that can also range from nine to twelve teeth affected patients over 64 years of the maxillary level with 7.6%.

**Table 5. Distribution of the patients according to the number of absent teeth and the age**

Age (years)	Number of absent teeth for maxillary/mandible					Total
	1-4 teeth	5-8 teeth	9-12 teeth	13-16 teeth	16/16 teeth	
15-24	196	32	17	7	0	252
25-34	135	20	27	83	0	265
35-44	188	22	25	1	0	236
45-54	78	80	13	48	0	219
55-64	58	0	64	18	0	140
65-74	0	20	42	34	65	161
75 or +	0	0	0	0	40	40
Total	655	174	188	191	105	1313

$DLL=6$   $Chi2=115,83$   $P=10^{-8}$ ,  $Chi2$  valid

There was a statistically significant relationship between age groups 25-34 years and the number of missing teeth (1-4 teeth) at the mandibular and maxillary levels.

In 1998, STEELE reported that the average number of missing teeth per person in the United Kingdom is: 7.2 among the over-16s, 14 among the 65-74-year-olds. The number of teeth present decreases with age and women seem to be more affected than men [9].

In our study, we can say that the high number of missing teeth would be related to multiple dental extractions following the delay of consultation of our patients. Elsewhere, we must add non-formal dental extractions (by traditional healers) in our societies.

- Frequency and types of edentation:

Edentulousness is a real public health problem in our society, every loss of tooth is a threat to the general health of the individual, this is all the reality that toothless people are still victims of the consequences of toothlessness.

**Table 6. Distribution of the population by the age and the type of edentation according to the classification of Gaillard H et A**

Age (years)	Type edentation according to Gaillard H et A			Total
	Partial edentation	Subtotal edentation	Total edentation	
15-24	252	0	0	252
25-34	265	0	0	265
35-44	236	0	0	236
45-54	158	61	0	219
55-64	122	18	0	140
65-74	42	54	65	161
75 or +	0	0	40	40
Total	1075	133	105	1313

$DLL=6$   $Chi2=39,40$   $P=10^{-7}$ ,  $Chi2$  validated

There was a statistically significant relationship between age groups 25-34 years and partial edentation. However, Total edentulism was restricted to the 75-plus age group.

In addition, the need to restore missing teeth is expressed in one way or another in our society.

In this work, the majority of our patients were partially edentulous (81.9%). Subtotal edentulous were observed in 133 patients, ie 10.01%. Those totally toothless were 8%.

In France in 2010, a study of metal frame prostheses found that 36.9% of subjects had partial tooth loss; 38, 6% were total toothless [10].

A study, conducted by MULLER et al. 2007, on a sample of Swedish women, showed the evolution of the total edentulousness rate:

- In 1969, among these women then aged 54, it was 15%;
- In 1981 at 62 years this rate had increased and was 22%;
- In 1993, among these same 78-year-old women, the rate was 26% [11].

DJEREDOU K.P AND COLL (2002) in Côte d'Ivoire reported in a study of 1200 subjects that 16% were total edentulous patients [12].

- Concept of wearing prostheses:

In our study, 1168 toothless patients had never worn a prosthesis, ie 89.0% of patients. In contrast, 7%, 1% and 3% of patients had a partial removable prosthesis, total removable prosthesis and fixed prosthesis, respectively.

This notion of wearing a prosthesis was also found in a study conducted in 1997 on patients aged 35 to 44 in France. It has made it possible to anticipate an increase in removable prosthesis needs for the years 2005, 2010 and 2020 with the increase in the population and the aging of the population.

**Table 7. Distribution of patients according to the wearing of prosthesis**

<b>Wearing of prosthesis</b>	<b>Number</b>	<b>Frequency (%)</b>
Removable partial prosthesis	92	7,0
Removable Total prosthesis	13	1,0
Fixed prosthesis	40	3,0
<b>None</b>	<b>1168</b>	<b>89,0</b>
Total	1313	100,0

*In our study 1168 edentulous patients (89,0%) of the cases had never wear a dental prosthesis.*

ZITZMANN published in 2007 that 15 million adults are partial toothless and use the removable or fixed prosthesis to replace their missing teeth.

Approximately 30% of adults have partial removable prosthesis (PRP) in 2001. This rate increases in 2007 with 71% Among people over 60 who have removable dentures, 38% of whom have one or two total prosthesis [13].

In a study based on a questionnaire in Paris 2001, nearly a quarter of individuals are carriers of removable prosthesis including 19% partial toothless [14].

Two studies were conducted ten years apart, the first in 1995 and the second in 2005. The authors observed two populations 35-44 years and 65-74 years. In the youngest age group, the use of the removable prosthesis increased from 4.8 to 11.2% and among older patients from 58.6 to 74.5% [15].

In the United Kingdom two studies were conducted in a population over 15 years, from 1992 to 2002. 18.8% of this population carried PRP in 1992 and 11.2% in 2002. The prevalence PRP increases with age. These restorations concern the mandible more than the maxilla, and women are more concerned than men [16].

These different studies corroborate our results. Among our patients 7% are PRP carriers; 89% are in need of prosthesis wearing and women are the most concerned with 60.6%.

This low rate of wearing prosthesis found in our population will be related to the illiteracy of our population, its ignorance of the existence of dental prosthesis and its precarious financial situation.

### 3 CONCLUSION

Based in the findings above, a large part of the population had incomplete dentition. Our study showed descriptively a predominance of female sex with 60.6%. The most represented age group was 25-34 years old with 20.2%. Dental pain was the main reason of consultation with 52.9%. Dental decay and its complications were the main cause of the patient's toothlessness 69.8%. Edentations: partial (81.9%), subtotal (10.1%) and total (8.0%) were observed. Edentulous patients who never had dentures were represented with 89.0% of cases. The removable prosthesis can and should be considered as a reliable prosthetic restoration. The therapeutic result depends on the information, the awareness of the patients on the importance of the wearing of the removable dental prosthesis.

#### WHAT IS ALREADY KNOWN ON THIS TOPIC

Include maximum of 03 points of what is already known on this topic (in bullet points)

- Tooth loss is a real public health problem worldwide
- They are responsible for aesthetic, functional (nutritional, phonetic) and psychological disturbances.
- Prosthetic management of edentulousness constitutes a therapeutic necessity for this handicap.

#### WHAT THIS STUDY ADDS

Include maximum of 03 points of what your study adds (in bullet points)

- This study is a first in Mali.
- It has a certain interest for public health
- It provides the epidemiological elements necessary for the evolution of the policy in charge of toothlessness in Mali.

#### AUTHORS' CONTRIBUTIONS

A.B. and I.H.S. conceived and designed the study and performed the statistics; I.B. and A.A. synthesized and wrote the manuscript; all authors have contributed to analyzing the data and revising the manuscript.

#### REFERENCES

- [1] ROBERT-BOBEE I. "Projection de la population pour la France métropolitaine à l'horizon 2050: la population continue de croître et le vieillissement se poursuit". INSEE première, 2006, numéro 1089.
- [2] LE BOT P. "Données statistiques sur les extractions et prothèses adjuvées partielles à châssis métallique en 2010 pour le Finistère". Données par la CPAM (Caisse Primaire d'Assurance Maladie du Finistère) numéro 89.
- [3] GAILLARD PERERA H; GAILLARD A. "Les édentations chez les personnes âgées. Quand et comment y pallier, quand et pourquoi les promouvoir". Rev.de Gérontologie 1992; 17: 99-105.
- [4] STEELE J.G., TREASURE E., PITTS N.B., MORRIS J., BRADNOCK G. "Total loss in the United Kingdom in 1998 and implications for the future". Br. Dent. J., 2000, 189 (11): 598-603.
- [5] N'GUESSAN K. S., AMANI S. R., AHOGNY N., N'DINDIN A. C., ELABO K. L. R., ASSI K. D. "CONSEQUENCE DE L'EDENTEMENT SUR LE NIVEAU DE PERCEPTION DE SOI", Rev. Iv. Odonto-Stomatol., vol. 11, n° 2, 2009, pp. 21-26.
- [6] GUEYE M., MBODJ EB., THIOUNE N., SECK AK., TOURE A., DIENG L. "EVALUATION DE LA PREVALENCE DE L'EDENTEMENTDANS UNEPOPULATION URBAINE AU SENEGAL," Rev. Iv. Odonto-Stomatol., Vol. 17, n° 2, 2015, pp. 15-20.
- [7] Hescot P., Bourgeois D., Doury J. "Oral health in 35-44 year old adults in France". Int. Dent. J. 1997; 47: 94-99.
- [8] Hummel SK, Wilson MA, Marker VA. "Quality of removable partial dentures worn by the adult U.S. population." J Prosthet Dent. 2002; 88: 37-43.
- [9] STEELE J.G., TREASURE E., PITTS N.B., MORRIS J., BRADNOCK G. "Total loss in the United Kingdom in 1998 and implications for the future." Br. Dent. J., 2000, 189 (11): 598-603.
- [10] ESCURE S. "Crochets en prothèse amovible à châssis métallique". Le Chirurgien Dentiste de France, 2010, 1456: 35-38.
- [11] MULLER F, NAHARRO M., CARLSSON G.E. "What are the prevalence and incidence of tooth loss in the adult and elderly population in Europe?" Clinical Oral Implants Research, 2007, vol. 18 Suppl 3, p. 2-14.
- [12] DJEREDOU K.P. ET COLL. "Besoin prothétique en milieu Rural: enquête épidémiologique auprès de la population de Ourahio (Côte D'Ivoire)". Presse universitaire de Côte D'Ivoire (PUCI) 2002.

- [13] ZITZMANN N.U., HAGMANN E., WEIGER R. "What is the prevalence of various types of prosthetic dental restorations in Europe?" *Clin. Oral Impl. Res.*, 2007, 18 (Suppl. 3): 20-3.3.
- [14] PICART B., DELCAMBRE T., LEFEVRE C., BIDEAUX H. "Rationalisation dans la conception des tracés de prothèse métallique amovible: logique et simplicité. Stratégie prothétique," Paris 2002, 2 (1): 29-38.
- [15] ECLASSAN R., CHAMPION J., ECLASSAN-NOIRRIE E., GUYONNET J.J. "Plan de traitement en prothèse partielle adjointe". *Enclyp. Méd. Chir. (Elsevier Masson SAS, Paris), Odontologie*, 23-310-E-10, 2003, 10p.
- [16] GRAHAM R., MIHAYLOV S., JEPSON N., ALLEN P.F., BOND S. "Determining "need" for a Removable Partial Denture: a qualitative study of factors that influence dentist provision and patient use". *Br. Dent. J.*, 2006, 200: 155-158.