

# Socioeconomic Determinants and Demand for Dental Avulsions at the Institute of Odontology and Stomatology Clinic in Dakar

Mbathio Diop<sup>1,\*</sup>, Khadim Seck<sup>2</sup>, Serigne Ndam Dieng<sup>1</sup>, Amadou Dieng<sup>1</sup>,  
Machihoudou Orou Yanrigui<sup>1</sup>, Aida Kanoute<sup>1</sup>, Massamba Diouf<sup>1</sup>, Daouda Faye<sup>1</sup>,  
Cheikh Mouhamadou Mbacké Lo<sup>1</sup>

<sup>1</sup>Public Health Department, Odontostomatology Institute, Faculty of Medicine, Pharmacy and Odontology and Stomatology, Cheikh-Anta-Diop University, Dakar, Senegal

<sup>2</sup>Department of Oral Surgery, Institute of Odontostomatology, Faculty of Medicine, Pharmacy and Odontology and Stomatology, Cheikh-Anta-Diop University, Dakar, Senegal

## Email address:

diopmbathio@yahoo.fr (Mbathio Diop), seckkhadim40@gmail.com (Khadim Seck)

\*Corresponding author

## To cite this article:

Mbathio Diop, Khadim Seck, Serigne Ndam Dieng, Amadou Dieng, Machihoudou Orou Yanrigui, Aida Kanoute, Massamba Diouf<sup>1</sup>, Daouda Faye, Cheikh Mouhamadou Mbacké Lo. Socioeconomic Determinants and Demand for Dental Avulsions at the Institute of Odontology and Stomatology Clinic in Dakar. *International Journal of Health Economics and Policy*. Vol. 8, No. 1, 2023, pp. 23-27.  
doi: 10.11648/j.hep.20230801.14

**Received:** January 5, 2023; **Accepted:** February 1, 2023; **Published:** March 9, 2023

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**Abstract:** Dental avulsion is one of the most common acts performed in dentistry. It concerns both the young population, but its prevalence increases with age. The objective of this work was to study the socio-economic determinants and the demand for dental avulsions at the Institute of Odontology of the Cheikh Anta Diop University of Dakar (UCAD). This was a descriptive cross-sectional study of patients who were seen in the oral surgery department of the UCAD Odontology Clinic. Data were collected from medical records from October 14, 2019 to March 28, 2020. Tools used to collect and process the information were Sphinx software and Excel spreadsheet. From this, it was found that of the 525 patient records, 60% were male and 52.19% were between the ages of 20 and 39 years. More than half (53.14%) of patients lived less than 5 km from the health care facility and 42.7% of patients had a monthly income of between 50,000 and 100,000 FCFA. Clinically, 49.9% of patients came for an odontalgic reason and periodontitis followed by coronal destruction were the most diagnosed pathologies. Also, there is a relation between diagnosis and the variables age and income with respectively P-value 0.023 and 0.001. Closeness to health facilities, income, and cost of treatment are factors that influence accessibility to oral health care. It is important to integrate the health care consumer's profile in the overall approach to care.

**Keywords:** Dental Avulsions, Consumers, Profile, Dental Clinic, Senegal

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## 1. Introduction

Dental avulsion is one of the most common dental interventions [1]. Tooth loss is still a major public health concern around the world [2]. However, dental avulsion has numerous consequences for the patient, including professional and school absence, aesthetic deficits, functional problems and, above all, the high cost of dental care [3]. It is strongly decreasing in several developed countries, because of the

considerable progress made in the prophylactic and therapeutic field of oral diseases [3]. On the other hand, in developing countries there is still a high prevalence (12.30% to 33.40%) of dental avulsions in daily practice [4, 5, 6]. Several studies have shown that dental caries is the primary cause of dental avulsions [1, 2]. Apart from dental caries, periodontal disease is the second most common cause of dental avulsions [7, 8]. Dental avulsions are very often performed in the elderly and there is evidence that the prevalence of lost teeth increases with age [9]. Also, oral

diseases are the fourth most costly disease in the world [10]. In Senegal, they represent a significant cost for health insurance. In fact, 78.9% of institutions have oral health care expenses greater than 10% and more than half (52.1%) greater than 20% of total health expenses [11]. In this context, the study on the estimation of consumers' needs for dental avulsions plays an important role in addressing the barriers to health care consumption. The objective of this study is to assess the need for dental avulsions at the Odontology Clinic of the University Cheikh Anta Diop Dakar (UCAD).

## 2. Methodology

### 2.1. Case Study

The study focused on the oral surgery clinic of the Institute of Odontology-Stomatology (IOS) which is the unique public training structure for dental surgery in Senegal.

### 2.2. Type of Study

This is a descriptive cross-sectional study whose purpose is to evaluate the costs of dental avulsions in the Oral Surgery/IOS/UCAD department from October 14, 2019 to March 28, 2020.

### 2.3. Population of Study

The study population was comprised of the records of patients who were enrolled during this period for single and multiple avulsions provided.

### 2.4. Selection Criteria

The selection criteria are listed below:

- 1) Procedure whose diagnosis is established and validated by an oral surgery teacher;
- 2) Procedure supervised by an oral surgery teacher;
- 3) Procedure completely performed by the student.

### 2.5. Survey Variables

Epidemiological data collected were sociodemographic clinical characteristics. Sociodemographic characteristics were estimated by age, gender, income, distance traveled and occupation. Age was collected in years and divided into four (04) modalities; (< 20 years, [20 to 39], [40 to 59], > 60 gender (Male/Female); Monthly income corresponds to the individual's total monthly earnings evaluated in CFA francs, is divided into five (05) categories (< 50,000, [50,000 to 100,000], [100,001 to 150,000], [150,001 to 200,000] > 200,000); Distance travelled corresponds to the estimated

distance in km between the patient's home and the IOS, it is made up of five (05) modalities (< 5, [5 to 9.9], [10 to 14.9], [15 to 20] and > 20 km). The cost of the treatment (in CFA) was estimated by several modalities which varied from less than 7,000, [7,000 to 14,000], [14,001 to 21,000], [21,001 to 28,000], [28,001 to 35,000] and more than 35,000 and finally the occupation with the modality: students, traders, housewives, retired people, carpenters, pupils and others. The clinical observations refer to the reason for the consultation, the distribution according to the teeth concerned and the diagnosis.

### 2.6. Data Collection

To collect the information for this study, the following procedure was adopted.

#### 1) Administrative measures

Before starting the survey, a letter was sent to the director of the Institute of Odontology-Stomatology of Dakar, to request authorization, which was obtained. Similarly, confidentiality of the data collected was respected.

#### 2) Period of study

The study took place from October 14, 2019 to March 28, 2020 during clinics.

#### 3) Data collection and treatment tools

Tools used to collect and treat our information were: notebook to record responses from the interviews and our various observations; questionnaire and interview guide, Sphinx software to enter data and generate results, and Excel spreadsheet to organize results into tables.

#### 4) Data Sources

Data collection sources were: patient files and registers; manager's documents; UCAD library; CESAG library; websites of organizations such as WHO, FDI, etc.; and scientific literature.

## 3. Result

This chapter consists of two parts: sociodemographic and clinical characteristics of the patients.

### 3.1. Sociodemographic Characteristics

The study allowed us to note that out of the 525 patient files received in the oral surgery department during our collection period, 60% of these patients were male, the average age of the patients was 41 years and their average income was approximately 116,667 FCFA. All the socio-professional characteristics of the patients are presented in the following (Table 1).

*Table 1. Distribution of patient characteristics according to their frequencies.*

Characteristics	Number (n=525)	Percentage	Average
Sexe			
Men	315	60%	sex-ratio: 1,5
Women	210	40%	
Years			
< 20 years	12	2,29%	41 Years
[20 à 39]	274	52,19%	

Characteristics	Number (n=525)	Percentage	Average
[40 à 59]	145	27,62%	
> 60 ans	94	17,90%	
Distribution of patients by income (in FCFA)			
< 50 000	15	2,9%	
[50 000 à 100 000]	224	42,7%	116 667
[100 001 à 150 000]	128	24,4%	
[150 001 à 200 000]	141	26,9%	
> 200 000	17	3,2%	
Cost of treatment (in FCFA)			
< 7 000	137	26,1%	
[7 000 à 14 000]	162	30,9%	14717,14 FCFA
[14 001 à 21 000]	79	15,0%	
[21 001 à 28 000]	90	17,1%	
[28 001 à 35 000]	39	7,4%	
> 35 000	18	3,4%	
Distribution of patients by distance travelled (in km)			
< 5	279	53,14%	
[5 à 9.9]	79	15,04%	10,4 km
[10 à 14.9]	66	12,58%	
[15 à 20]	47	8,95 %	
> 20 km	54	10,28 %	
Distribution of patients by occupation			
Student	147	28 %	
Traders	92	17,52 %	
Housewives	54	10,29 %	
Retired people	29	5,52 %	
Carpenters	13	2,48 %	
Pupils	12	2,29 %	
Other (unemployed, tailors, policemen, secretaries, teachers...)	178	33,90 %	

### 3.2. Clinical Characteristics of the Patients

#### 1) Nosological profil

The study allowed us to note that 49.9% of the patients

came to the clinic for an odontological reason, followed by 18.7% of systemic visits. The clinical characteristics of the patients are summarized in the following table 2.

**Table 2.** Distribution of clinical aspects of patients according to their frequency.

Clinical aspects	Number (n=525)	Fréquence
Reasons for consultation		
Odontalgia	262	49,9%
Systemic visit	98	18,7%
Referred	92	17,5 %
Functional	32	6,1 %
Aesthetic	14	2,67 %
Other	27	5,14%
Distribution according to teeth involved		
Avulsion of simple monoradicular teeth	76	3,5%
Avulsions of single pluriradicular teeth	141	6,47%
Multiple avulsions of monoradicles	928	42,68%
Multiple avulsions of pluriradicular teeth	1038	47,40%
Number of sessions of the whole treatment		
1	36	6,8%
2 à 3	443	84,4%
Au moins 4	46	8,8%
Diagnosis + Clinical signs		
Chronic apical periodontitis	177	33,71%
Total coronal destruction	141	26,86%
Acute apical periodontitis	60	11,43%
Important coronal destruction	34	6,48%
Pulpal necrosis	31	5,90%
Mobility	31	5,90%
Other	51	9,71%

#### 2) Distribution of patient income by cost of treatment

Regarding the cost of treatment, 57% of patients had paid

between 7,000 and 14,000 FCFA. In addition, 45.6% had a maximum income of 100,000, of which 2.9% had less than

50,000 and 42.7% had an income between 50,000 and 100,000 FCFA (Table 3).

**Table 3.** Distribution of patient income by treatment cost.

Income Cost of treatment	< 50 000	[50 000 à 100 000]	[100 001 à 150 000]	[150 001 à 200 000]	>200 000	Total
< 7 000	7	83	21	21	5	137
[7 000 à 14 000]	4	70	44	40	4	162
[14 001 à 21 000]	1	19	23	32	4	79
[21 001 à 28 000]	1	34	21	31	3	90
[28 001 à 35 000]	1	11	13	13	1	39
> 35 000	1	7	6	4	0	18
Total	15	224	128	141	17	525

## 4. Discussion

The study conducted on 525 patients who had undergone dental avulsions showed that the age range of 20 to 39 years was the most represented with 52.19% of patients. The average age of patients was 40.24 or 41 years. In Benin a study conducted by Bancolé *et al* (2013) showed that average age was  $37.90 \pm 18.96$  years with a range from 0 to 92 years [12]. On the other hand, Passarelli PC, in 2020 found in his study that the age range 23-91, was the most representative of which caries (52.2%) was the most frequent reason for extraction with periodontal disease (35, 7%) [13]. The predominance of patients between the ages of [20-39] years among the cases is explained by the high prevalence of dental caries and its complications in these age groups, as confirmed by the results of a study done in Cameroon, which indicates that it is 51.5% in the age group [11-18] years [14].

Moreover, the majority of patients are male, representing 60% of patients with a sex ratio of 1.5. This result is somewhat similar to that found in the study by Guiguimde (2014) in Burkina Fasso, where males represented 42.9% with a sex ratio of 0, 96 (3). However, Jafarian (2012) in Iran reported a male predominance with 55.3% of avulsions [15]. This male predominance in our study may be explained by the fact that in our context men are less concerned about their oral hygiene while women are more concerned about their health status [3, 16]. Contrary to the study by MEN Abena *et al* in Cameroon in 2020 where women represented 62% with a sex ratio of 1.18 [1]. Similarly for the Bancolé study in Benin, women represented 57.85% of patients [12]. According to reasons for consultation, almost half of the reasons were of odontalgic origin, representing 49.9% of patients. This is valid in the MEN Abena study [1] in Cameroon where pain was the most frequent reason for consultation with 78.2% of cases. It was also the main reason for consultation in the study by Aidara AW *et al* in 2012 on the use of oral health services by Senegalese residents in Lombardi in Italy, in 84% of cases [17]. The study of SECK A (2016) in Senegal showed pain as the main reason for consultation with 52.8% of reasons for consultation [18]. Also, Songo BF *et al* in Congo (Kinshasa) in 2010, found that 79% of the cases that led to a consultation were due to caries-related pain and its complications [19]. Indeed, several studies in the African sub-region have found that pain is the most frequent manifestation of oral pathologies. And very often, it is when it becomes intolerable that a patient

goes to see a specialist [1, 18, 12].

Regarding the distribution according to locality, 53.14% of the patients lived less than 5 km from the IOS facility. This result is explained by the fact that most of the patients were students and many of them lived in the UCAD neighbourhood. Some of them even live in the UCAD university residential buildings.

In terms of etiology in our study, 45.13% of patients were diagnosed with apical periodontitis. Total coronal destruction (TCD) was observed in 26.86% of patients. In Benin according to the study done in 2013 by Bancolé *et al*, avulsions were mostly due to caries with a frequency of 65.90%, and periodontal disease (9.50%) [12]. For comparison, it is interesting to note that Kaboré (2021) Burkina Faso and Nokam (2020) in Cameroon found respectively in their studies 87% and 66% of cases of dental avulsion due to dental caries. [20, 1] Byahatti SM (2011) found in his study 55.90% of cases of avulsions caused by dental caries [21].

According to type of teeth extracted, we find in our study, that the majority of avulsions of pluriradicated were 53.87% of cases. (47.40% multiple pluriradicate avulsions and 6.47% single pluriradicate avulsions). This finding is similar to that of Bancolé [12]. where molars were extracted more often in both permanent (69.46%) and temporary (55.84%) dentition while canines were extracted less often (1.73% in permanent dentition and 10.83% in temporary dentition). Similarly, in Mangaga's (2000) study, molars were the most represented with 43.9% of cases. [16]. This was also the case in the Cameroon study where molars were also the most extracted teeth with 63% of cases [1]. Regarding cost of treatment, average cost of treatment in our study was 14,717.14 FCFA or about 14,720 FCFA. However, 30.9% of patients paid between 7,000 and 14,000 FCFA. Our results are slightly higher than those of Lô *et al* (2011) where majority of patients spend less than 10,000 FCFA on oral health [22]. In relation to monthly income, 42.7% of patients had an income between 50,000 FCFA and 100,000 FCFA. This result differs from the results of Diop *et al* (2017) where 48.7% of household heads had monthly incomes below 50,000 FCFA and only 5.7% of household heads earned 300,000 FCFA and above [23].

## 5. Conclusion

Socioeconomic factors are very important in the accessibility of oral health care for the population. This study

allowed us to have an idea of socio-demographic characteristics of the patients and of some clinical aspects such as: reasons for consultation, avulsed teeth, diagnoses. At the same time, dental avulsions are frequently performed in the oral surgery department of the Institute of Odontology-Stomatology of Dakar. This study gives an idea of the need for avulsions. However, it would be interesting to calculate the costs to better understand the pricing.

## Acknowledgements

We thank the entire team of the oral surgery department of the Institute of Odontology and Stomatology of Dakar.

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