



Assessment of the Oral Condition of the Congolese Population Based on 688 Orthopantomograms at the Biamba Marie Mutombo Hospital in Kinshasa: Cross-Sectional Hospital Study

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Abstract

Background and objective: Oral pathologies are part of dangerous diseases and increase the economic burden of households in the Democratic Republic of Congo. The objective of this study is to establish an orthopantomographic profile (OPT) of the oral and dental condition of the population of Kinshasa.

Methods: Documentary and descriptive cross-sectional study which included 688 medical files of patients who underwent OPT at the Biamba Marie Mutombo Hospital (BMMH) over a period of 24 months, from January 2020 to January 2022. Data such as age, sex and oral condition were studied. **Results:** the teeth of the incisor-canine sector were the most present in the mouth and were the least affected. We also note a high proportion of missing wisdom teeth, whether mandibular or maxillary. The 2nd premolars and the 1st maxillary molars are most often absent. The most dilapidated teeth were those of the posterior mandibular or maxillary sector, particularly the premolars and two first molars. We note that the teeth in the posterior, mandibular or maxillary sector were those which benefited the most from composite treatment.

Conclusion: This study shows that despite the dental care of patients, the dental condition of the population of Kinshasa is dilapidated.

Subject Areas

Dentistry

Keywords

Dental Status, Orthopantomographic Profile, Population of Kinshasa

1. Introduction

Largely preventable, oral diseases are chronic, lifelong conditions [1] inextricably linked to overall health and well-being [2]. Evolving research indicates that oral disease is linked to systemic conditions such as diabetes and cardiovascular disease [3] [4] [5]. Approximately 3.5 billion people worldwide have active oral disease [6]. The World Dental Federation (FDI) estimates that 60% - 90% of schoolchildren and almost 100% of adults worldwide have suffered from dental caries during their lifetime [7]. Although oral health promotion interventions that target individual behavior change have had some success, the prevention and management of oral diseases that consider social determinants warrant a more comprehensive approach [8]. Dental plaque is a major biological determinant of oral diseases [9]. Untreated cavities and periodontal disease are linked, in part, to personal oral hygiene practices designed to remove this plaque. Oral hygiene (toothbrushing) with fluoridated toothpaste is the most important behavioral factor affecting both dental caries and periodontal disease [8]. However, behavioral preventive approaches alone are not sufficient to address oral health inequities [10] [11]. The objective of assessing the oral health of a given population is to adopt an appropriate health policy with preventive purposes, but also to assess the needs of this population with regard to oral care. Oral diseases currently constitute, taking into account their prevalence in the world, a real public health problem throughout the world, in industrialized countries as, increasingly, in developing countries, especially in the most vulnerable communities poorer [12] [13]. The situation remains chaotic in the Democratic Republic of Congo with a prevalence of oral disease of more than half of the population, led by dental caries at 79.1% according to a study conducted by Songo *et al.* in 2011; Risk factors such as excess sugar consumption, lack of regular tooth brushing, diabetes mellitus and tobacco consumption are the basis of the prevalence of oral diseases [14]. The objective of this study is to establish an orthopantomographic profile (OPT) of the oral and dental condition of the population of Kinshasa.

2. Patients and Methods

2.1. Study Design

This was a cross-sectional documentary and descriptive study of data from the medical records of patients who underwent OPT at the Biamba Marie Mutombo Hospital (HBMM) over a period of 24 months, from January 2020 to January

2022. The study population consisted of all patients with oral conditions attending the Biamba Marie Mutombo Hospital. The sample size was convenient and exhaustive, it included 688 patients without discrimination of age or sex. Systematic sampling technique was used to collect data for this study. Patients included in this study should necessarily perform an orthopantomography, who should be hospitalized in maxillofacial surgery at the Biamba Marie Mutombo Hospital. Their files should contain all elements or variables necessary to meet the objectives of the study.

2.2. Data Gathering

Data collection was done through a documentary review. This documentary review consisted of reviewing all the files of patients who had undergone orthopantomography, to retain only those meeting the inclusion criteria. An ad hoc sheet was designed to serve as a data collection tool. The following variables were searched in the patient files: age, sex and oral condition.

2.3. Operational Definitions

A decayed tooth is a tooth damaged by a dental pathology such as dental caries, periodontopathy or trauma.

The sample was divided into four groups based on age as follows: from 0 to 19 years old; from 20 to 39 years old; from 40 to 59 years old and from 60 years old and over. The oral condition of the population was assessed according to four parameters: intact teeth, missing teeth, teeth with composites and dilapidated teeth. Variations based on age and sex in these parameters were taken into account.

2.4. Statistical Analyzes

The data were entered using Excel 2010 software, after checking consistency and quality, they were exported to SPSS 21 for analysis. Descriptive statistics consisted of calculating the mean and standard deviation for quantitative data and percentages for categorical data. The chi-square test was used to compare proportions and the Student's t test to compare means. The value of $p < 0.05$ was considered the threshold for statistical significance. The notion of confidentiality was essential for our study, the data were collected anonymously, and were only used for the writing of this work.

3. Results

This study reports the results of a survey carried out among 688 patients residing in Kinshasa and having attended the radiology and medical imaging department of the Biamba Marie Mutombo hospital in Kinshasa in the Democratic Republic of Congo.

3.1. Oral Health of the Study Population

Figure 1 represents the distribution of the different parameters of the study. We

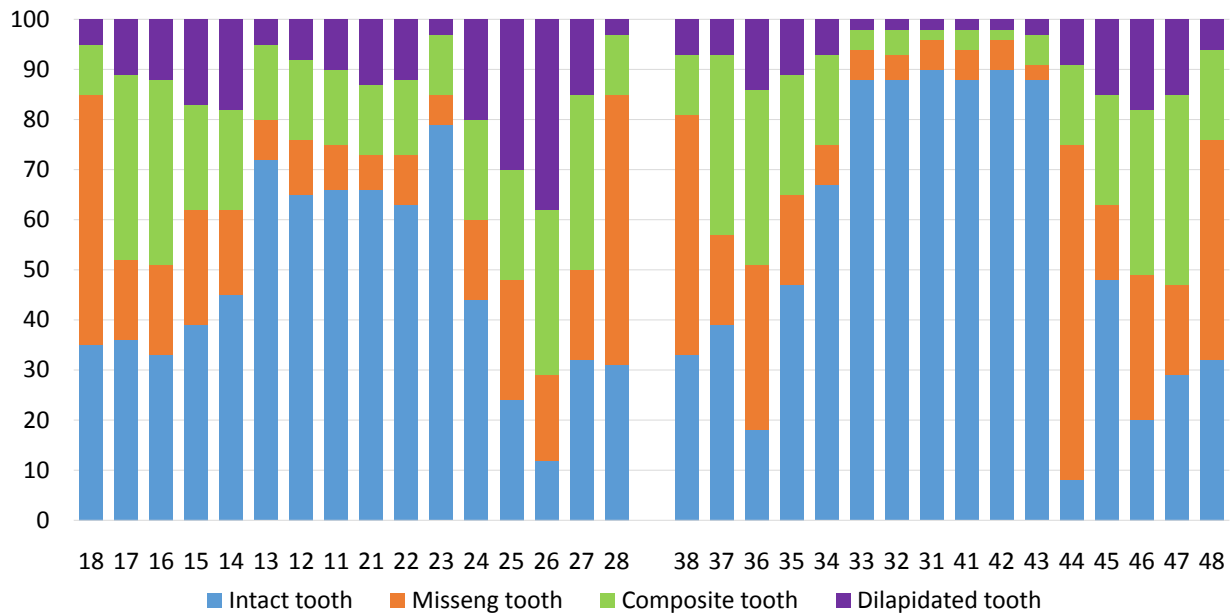


Figure 1. Presentation of the different characteristics of teeth.

immediately notice that the teeth in the incisor-canine sector were the most present in the mouth and that they were the least affected. We also note a high proportion of missing wisdom teeth, whether mandibular or maxillary (**Figure 1**).

3.2. Missing Teeth

Figure 2 represents the distribution of missing teeth in the oral cavity and we note a high proportion of missing wisdom teeth, whether mandibular or maxillary. Except for the 3rd molars, it is the 2nd premolars and the 1st maxillary molars which are most often absent. The incisor-canine sector is the most preserved sector since the average percentage of absence does not exceed 10%. The most common teeth are the canines and more particularly the mandibular canines (**Figure 2**).

We note whatever the age, it is always the third molars which are the most absent (**Table 1**). We also note a slight progression in the percentage of absence of canines and more particularly in the mandible and the frequency is significantly higher with increasing age ($p = 0.001$), this means that patients aged 40 and over had more a significant frequency of absence of canine ($p = 0.001$).

Figure 3 indicates that there is on average a slightly higher percentage of missing teeth in women, with the main difference being in wisdom teeth ($p < 0.001$). For the other teeth, the difference is not significant (**Figure 3**).

3.3. Dilapidated Teeth

The following graph (**Figure 4**) represents the distribution of dilapidated teeth and we note that the most dilapidated teeth are those of the posterior mandibular or maxillary sector, in particular the premolars and two first molars.

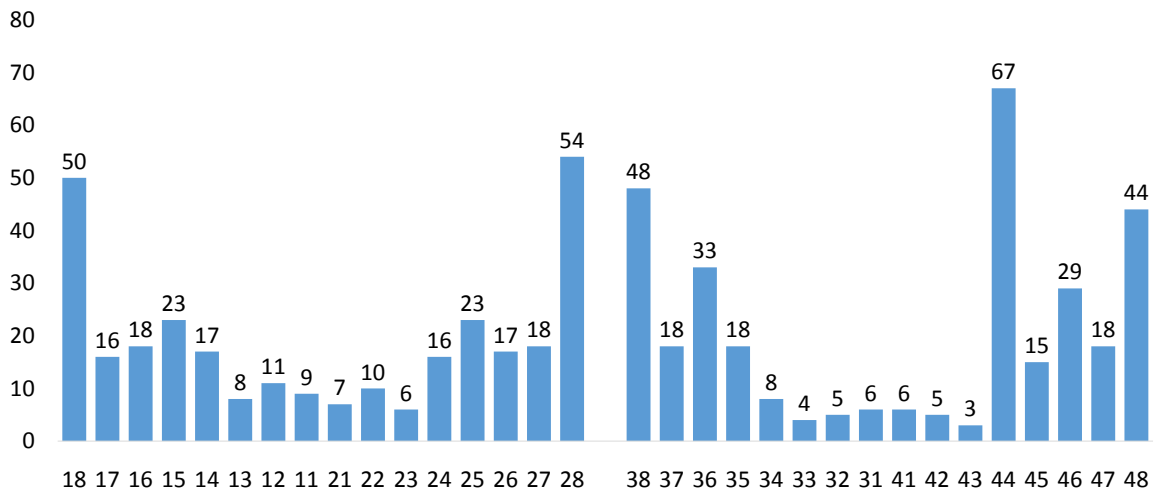


Figure 2. Distribution of missing teeth in the study population.

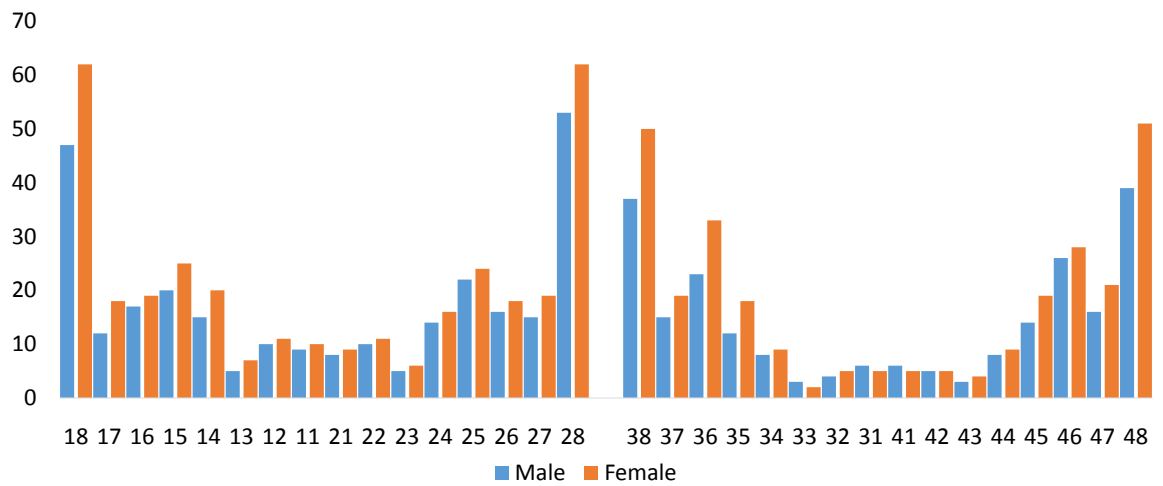


Figure 3. Distribution of missing teeth based on sex.

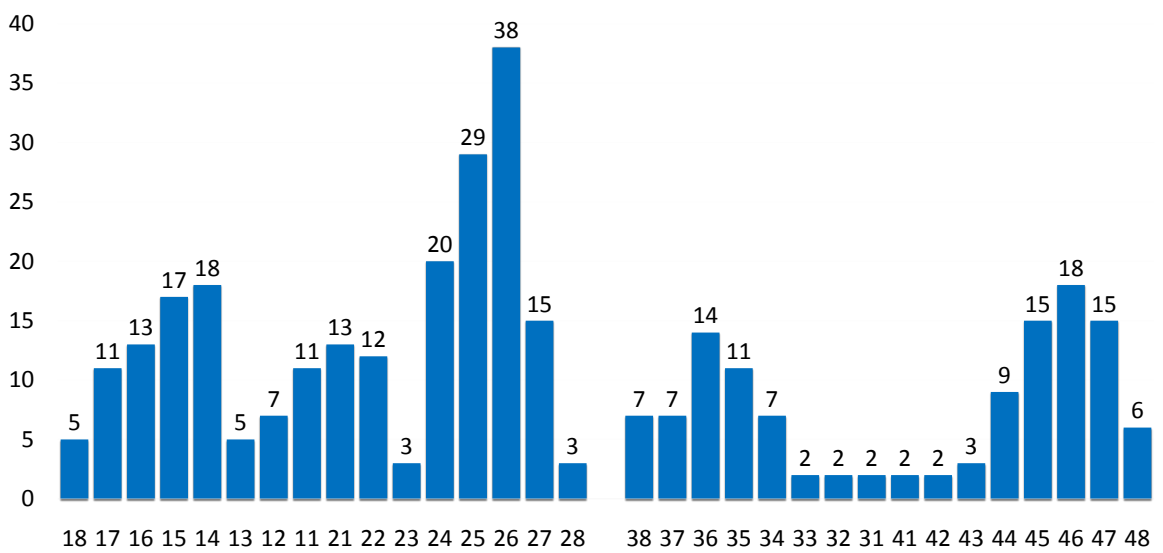


Figure 4. Distribution of decayed teeth.

3.4. Composite Teeth

Figure 5 represents the teeth having benefited from treatment with composites.

We note that the teeth in the posterior, mandibular or maxillary sector were those which benefited the most from composite treatment; in revenge, the incisor-canine block, particularly the mandibular block, was particularly not treated with composite (Figure 5).

4. Discussion

This study set itself the objective of establishing an orthopantomographic profile (OPT) of the oral and dental condition of the population of Kinshasa.

In our study, we note that the teeth of the incisor-canine sector are the most present in the mouth and that they are the least affected. We also note a high proportion of missing wisdom teeth, whether mandibular or maxillary.

Table 1. Distribution of missing teeth according to age and location in the mouth.

Age (year)	Teeth															
	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
0 - 19 (%)	22.3	1.1	2.1	8.3	5.4	0.0	2.4	1.6	0.4	1.0	0	4.8	7.4	1.1	1.1	21.0
20 - 39 (%)	57.1	13.6	14.3	18.8	12.3	2.6	6.5	4.5	5.2	7.1	1.9	11.0	20.1	14.3	14.9	52.6
40 - 59 (%)	71.6	26.4	37.1	40.7	35.0	14.3	22.1	20.0	17.1	20.0	14.3	28.6	37.9	32.1	32.1	75.7
≥60 (%)	79.0	42.0	47.0	46.0	42.0	21.0	23.0	23.1	24.0	23.2	24.0	20.3	39.0	47.0	45.1	84.2

Age (year)	Teeth															
	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
0 - 19 (%)	20.5	2.2	3.3	5.4	2.7	0.0	0.5	0.0	0.0	0.5	0.0	3.4	6.3	2.9	1.5	19.5
20 - 39 (%)	40.4	14.6	38.8	23.9	11.9	4.5	3.7	5.2	4.5	3.7	3.7	11.2	15.7	44.0	25.4	52.2
40 - 59 (%)	58.2	23.9	38.8	23.9	11.9	4.5	3.7	5.2	4.5	3.7	5.0	13.6	29.3	55.7	35.0	61.4
≥60 (%)	68.0	50.0	52.0	33.0	15.0	9.0	13.0	18.0	21.0	13.0	6.0	18.0	30.0	52.0	41.0	65.0

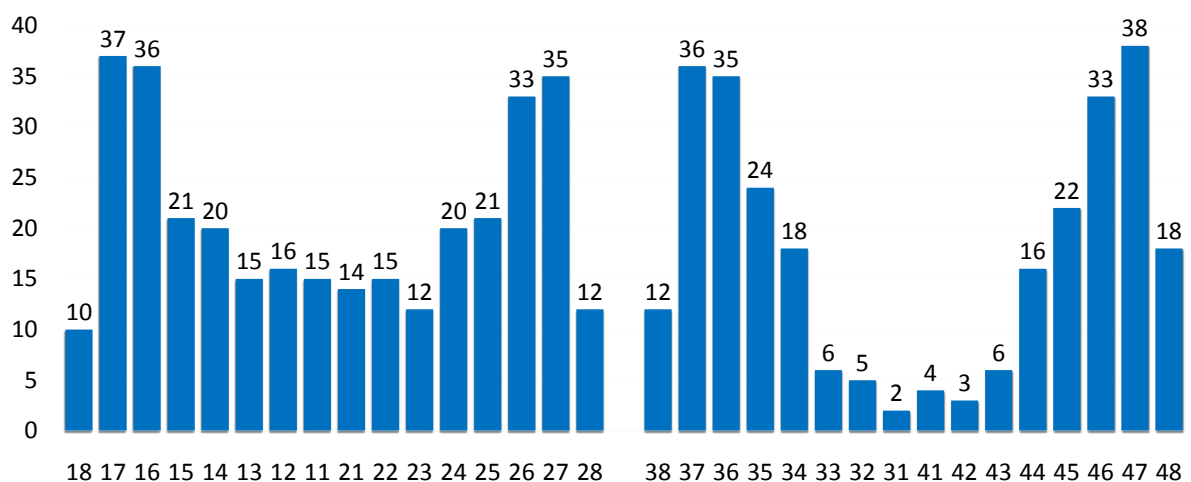


Figure 5. Distribution of composite teeth.

Indeed a very high proportion of missing wisdom teeth evolve in increasing age groups with already from 0 to 19 years an average percentage of 21.7% at the maxillary level and 20% at the mandible; for the age group of 60 years and over the average is 81.5% at the maxillary level and 66.5% at the mandible. We can therefore see that its position in the oral environment which makes it difficult to clean and its high prevalence of inclusion lead to a high proportion of pathology and therefore to its extraction. Therefore, for Akadri OA *et al.* [15] the main reason for extraction is pericoronitis and for ADEYEMO WL *et al.* [16], the main cause of extractions is caries (and its consequences) for 62.3%. The first mandibular molars and the maxillary premolars also represent a high percentage of absence, most probably related to caries and its consequences, periodontal problems and orthodontics as highlighted by several authors [17] [18]. Composite teeth with restoration have a higher prevalence in the first two molars, whether maxillary or mandibular, consistent with the studies of Adeyemo WL [16] and Bourgeois D *et al.* [19] concerning dilapidated teeth, they are mainly found in the posterior sectors. These results corroborate those of the entire literature [20] [21]. Interpretation of the results of the present study should take into account the limitations. The retrospective nature of the study constitutes a significant loss of some useful information and does not allow cause and effect to be established. The lack of several parameters in patient files constitutes a significant loss and could bias the results. To this end, a randomized study is awaited to circumvent this bias and resolve this ambiguity.

5. Conclusions

This study used 688 orthopantomograms from the Biamba Marie Mutombo Hospital to evaluate the dental health of Kinshasa's population, revealing a high incidence of missing wisdom teeth and poor condition of posterior teeth despite dental treatments, highlighting the need for improved oral healthcare.

At the end of this investigation certain provisions prove to be important in order to improve the oral and dental condition of the population of Kinshasa, it is necessary to make oral and dental care accessible on the one hand by increasing the number of staff in dentistry and others by reducing the cost; organize awareness and education campaigns for the population in terms of oral hygiene and implement a preventive strategy through the use of products intended for oral dental care based on fluoride.

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Authors' Contributions

GNN conceptualized the research topic, AAM, MTL and JTM drafted the pro-

TOCOL with input from GNN for the methods, prepared the submission for institutional review board approval, supervised the data collection and drafted the manuscript. ANN provided guidance for the statistical analysis. GML, STY, SMM, NKM, ATM, ESN, MTB and RMM provided content oversight for the manuscript. All authors read and approved the final manuscript.

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Availability of Data and Materials

The datasets analyzed during this study are available from corresponding author on reasonable request.

Consent for Publication

Not Applicable.

Conflicts of Interest

The authors declare no known conflict of interest.

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