Prevalence of Dental and Periodontal Diseases of Bamako Students

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Abstract: Oral health is an integral part of overall health and is essential to well-being. Oral diseases restrict school and personal activities and have consequences for health and quality of life. The management of oral diseases is expensive. The objective of this study is to describe the dental and periodontal disorders observed in schoolchildren in Bamako We carried out for three months an analytical cross-sectional study based on the observation of the oral state of the pupils of Bamako. The aim was to collect data by questionnaire administration and oral examination by the interviewer. The data collected from the survey sheet was captured and analyzed on the SPSS software version 19.0. Statistical calculations were performed with Pearson's Chi-2 with an alpha risk of less than or equal to 0.05. Of the 625 students surveyed, 51% were male and 49% female with a sex ratio of 1.04. The average age was 12 years with extremes of 5 to 18 years. The study showed that 6.24% never brushed their teeth and 46.4% of students did not do enough. The brushing technique was poor in 91.15% of students. The plaque index among students was low or "bad" in 9.76% of cases. The prevalence of tooth decay was 95.00%, while periodontal disease, malocclusion, tooth mobility were 87.84%; 62.88%; 21.60% of cases. Students had a pathological impairment in 35.00% and 6.24% of cases of dental fluorosis. In 30.24% of cases they had at least one consultation with the dental surgeon. There were no statistical links between sex, literacy level, oral hygiene and plaque index, malocclusion and sex, dental mobility. This study showed a high frequency of dental and periodontal diseases in Bamako schools. Promotion, prevention and early detection of these pathologies are needed to improve the health and quality of life of schoolchildren in Bamako.
Keywords: Oral disorders, pupils, caries, periodontal disease, Bamako.

INTRODUCTION

Oral health is an integral part of overall health and is essential to well-being. In fact, poor oral health can affect your appearance and your self-esteem. Oral diseases, on the other hand, restrict school and personal activities [1]. In the United States of America in 2000, oral health care was identified as the most prevalent unmet health need among children and has been the subject of much research and policy formulation [2]. The health of children is one of the first concerns of public health, especially in developing countries where infectious diseases still cause casualties among the infant population. However, in these countries, prevention and health programs are rare or non-existent in some places.

The study of the prevalence of dental and periodontal diseases in Bamako pupils will make it possible to determine the mapping of these pathologies but also to develop a school program of prevention of these affections. The objective of this study is to describe the dental and periodontal disorders observed in schoolchildren in Bamako.

MATERIALS AND METHODS

We conducted for three months (April 1 to June 30, 2013) a cross-sectional, analytical study based on the observation of the oral status of 625 students in Bamako. The target was schoolchildren identified through schools (public and private) of primary and secondary education in the six communes of the city. Schools were randomly drawn. For this study we administered a medical questionnaire, followed by an oral exam. We received approval from school authorities and informed consent from students. We used the plaque index to assess the quality of oral hygiene, the gingival index of LOË and SILNESS for gingival inflammation, the Mulhemann index for dental mobility and the CAD index for caries. The data was collected from a survey card, captured and analyzed on

SPSS software version 19.0. Statistical calculations were performed with Pearson's Chi-2 with an alpha risk of less than or equal to 0.05.

RESULTS

We surveyed 625 students, 51% male and 49% female, with a sex ratio of 1.04 (Figure 1). They came from the commune IV in 27, 20% of the cases followed by 24,64% of the Commune II (figure 2). Primary school students accounted for 54.65% of cases and 45.35% of cases in secondary school (Table I). The average age was 12 years with extremes of 5 to 18 years (Table II).

The study showed that 6.24% never brushed their teeth and 46.4% of students did not do enough (Table III). The brushing technique was bad for 91.15% of students (Table IV). Dental plaque on at least one tooth was observed in 66.08% of students. The plaque index among students was low or "bad" (2 - 3) in 9.76% of cases (Table V).

The prevalence of tooth decay was 95.00% (at least one decayed tooth in the mouth). 4.50% of students had a closed tooth (Figure 3) while periodontal disease was 87.84% (Table VI). The malocclusion was 62.88% (63.30% in girls versus 62.50% in boys) (Table VII). Dental mobility was 21.60% (23.90% for girls versus 19.40% for boys) (Table VIII). The students presented a pathological constraint 35.00% of cases (Figure 4) and 6.24% of cases of dental fluorosis (Figure 5). In 30.24% of cases they had at least one visit to the dentist's surgeon (Table IX).

There were no statistical links between sex, level of literacy, oral hygiene and plaque index; malocclusion and sex, dental mobility. Statistical calculations were performed with Pearson's Chi-2 with an alpha risk of less than or equal to 0.05.
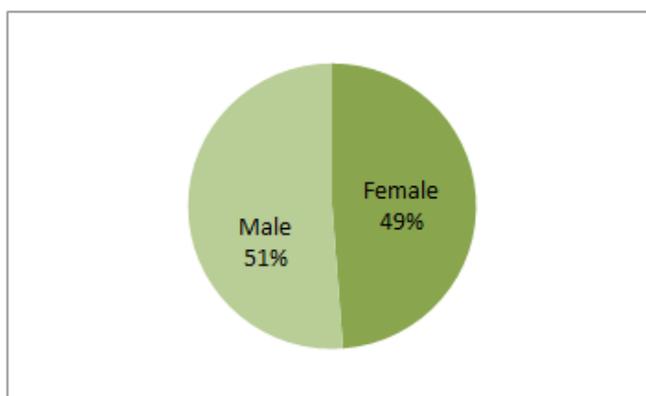
Chart-1: Distribution of students by gender
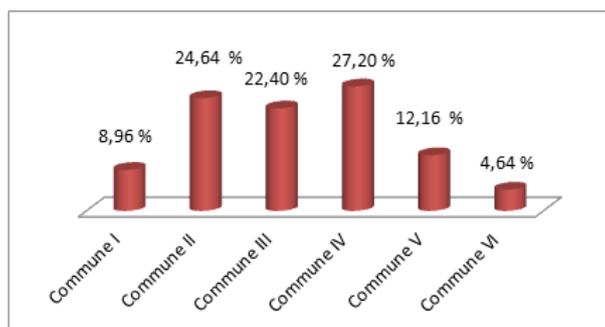
Chart-2: Distribution of students by location of recruitment

Table-I: Sex Distribution by Literacy Level

Schola level	Female n %		Male n %		TOTAL n %	
1st fundamental cycle	176	57,70	165	51,60	341	54,56
2nd fundamental cycle	129	42,30	155	48,40	284	45,44
Total	305	100,00	320	100,00	625	100.00

1st cycle = 1st to 6th year; 2nd cycle = 7th to 9th year

Chi-squared	ddl	P
16,61	8	0,03

Table-II: Breakdown of students by age

Age	Effective	Frequency (%)
5	12	1,92
6	36	5,76
7	31	4,96
8	32	5,12
9	41	6,56
10	44	7,04
11	35	5,60
12	84	13,44
13	78	12,48
14	79	12,64
15	70	11,20
16	47	7,52
17	29	4,64
18	7	1,12
Total	625	100,00

Table-III: Distribution of the brushing efficiency and according to the cycle of study

Level school / Brushing efficiency	Study cycle		Total
	1er cycle	2e cycle	
Score 4	32 9,85	7 2,33	39 6,24
Score 3	145 44,62	145 48,33	290 46,40
Score 2	117 36,00	126 42,01	243 38,88
Score 1	31 9,54	22 7,33	53 8,48
Total	325 100	300 100	625 100

Chi-squared	ddl	P
10,33	3	0,01

Score 1 = Brushes teeth very well (at least 2 times / day and after meals)
Score 2 = Brush your teeth well (1-2times / day including at least 1x after the meal)
Score 3 = Brushes teeth insufficiently (1 day / day before meal, 1-3x / wk)
Score 4 = Never brush your teeth

Table-IV: Distribution of students according to the technique of brushing teeth and sex

Sex / Technique of brushing	Female n %		Male n %		Total n %	
Good	18	6,06	35	11,59	53	8,85
Bad	279	93,94	267	88,41	546	91,15
Total	297	100,00	302	100,00	599	100,00

STATISTICAL TESTS	Chi-squared	P
Chi-squared - uncorrected	5,67	0,01

The bad technique was female There was a statistical link between bad technique and sex

Table-V: plaque distribution of plaque index by sex

Sex Plaque index	Female n %		Male n %		TOTAL n %	
Low (2 - 3)	22	7,21	39	12,18	61	9,76
Medium (1 - 1,9)	155	50,81	197	61,56	352	56,32
Good (0,1 - 0,9)	122	40,00	82	25,63	204	32,64
Excellent (0)	6	1,98	2	0,63	8	1,28
TOTAL	305	100,00	320	100,00	625	100,00

| Chi-squared	ddl	Probability
18,4798	3	0,0004

Expected value is <5. Invalid Chi-Square

There was a statistical relationship between the lowest plaque index and the male sex.

Table-VI: Gingival Index (GI) Distribution Based on Gender

Sex Indice gingival	Female %		Male n %		Total n %	
Inflammation absent (0)	48	15,74	28	8,75	76	12,16
Inflammation slight (0,1 - 0,9)	210	68,86	236	73,75	446	71,36
Average inflammation (1- 1.9)	43	14,09	51	15,94	94	15,04
Severe inflammation (2 - 3)	4	1,31	5	1,56	9	1,44
Total	305	100,00	320	100,00	625	100,00

Chi-Square	ddl	Probability
7,55	3	0,05
Expected value is <5. Invalid Chi-Square		

There was no statistical link between the two variables (chi-2 invalid)
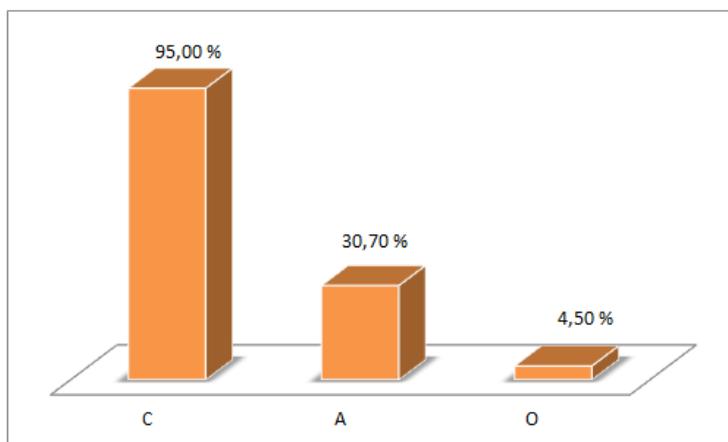
Chart-3: Distribution of students by CAO tooth

**Table-VII: Distribution of students according to dental malocclusion**

Sex / Dental malocclusion	Female n %		Male n %		Total n %	
Yes	193	63,30	200	62,50	393	62,88
No	112	36,70	120	37,50	232	37,12
TOTAL	305	100,00	320	100,00	625	100,00

STATISTICAL TESTS	Chi-square	P
Chi-squared - uncorrected	0,06	0,79

Table-VIII: Distribution of students according to dental mobility

Sex / Dental Mobility	Female n	%	Male n	%	Total n	%
Yes	73	23,90	62	19,40	135	21,60
No	232	76,10	258	80,60	490	78,40
TOTAL	305	100,00	320	100,00	625	100,00

STATISTICAL TESTS	Chi-squared	P
Chi-squared- uncorrected	1,66	0,19
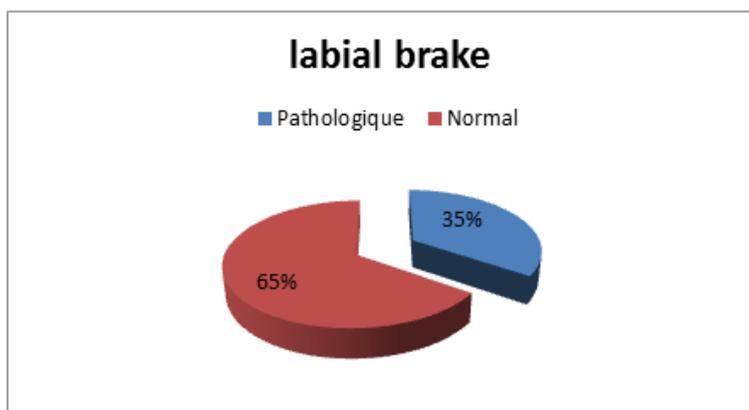
Graphique-4: répartition des élèves en fonction des freins labiaux
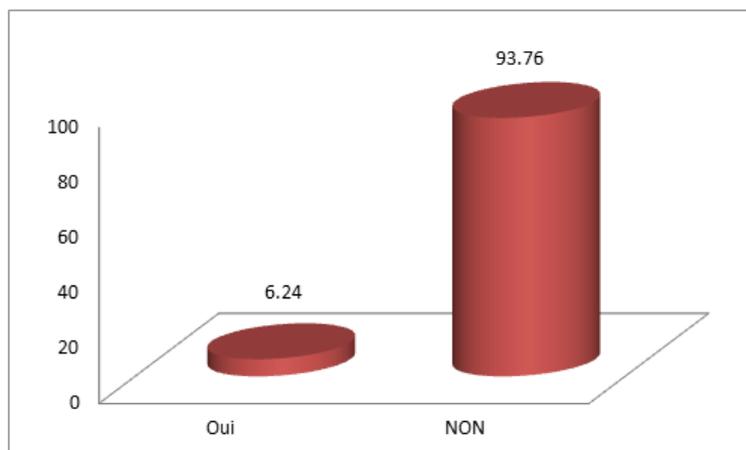
Chart-5: Distribution of students by dental fluorosis

Table-IX: Breakdown of students by visit to dentist

Consultation at the dentist surgeon	Effective	Frequency (%)
Yes	189	30,24
No	436	69,76
Total	625	100

DISCUSSION AND COMMENTS

The study involved 625 students of both sexes aged 5 to 18 years. The average age was 12 years old with a 12-year age. The sample consisted of 51.00% boys and 49.00% girls, a sex ratio of 1.04. They came from the commune IV in 27, 20% of the cases followed by 24, 64% of the Commune II.

SISSOKO B [3]. in Dakar reported 53% boys versus 47% girls in school children aged 3-15 years. GALARNEAU C, ARPIN S et al [4] reported in a clinical study on the oral health status of Québec students 49% of girls and 51% of boys, both in Grade 2 and Grade 6. In our study, 6.24% of students never brushed their teeth and 46.40% did not do enough. The technique of brushing teeth was poor in 91.15% of students.

PATRICK B. *et al.* [5] in the Quebec Secondary School Youth Health Survey 2010 -2011 reported that teens brushed their teeth at least twice daily with 77.8% (F = 85.0%, M = 77.8%). CHARLES H. B *et al.* [1] reported that teens who brush less than twice a day had satisfactory brushing in 25.2% of cases and 34.1% of those who brushed at least twice a day twice a day.

ANN F. [6] found caries frequency in 65.84% of students. Students had other oral conditions: dental mobility (21.65% of cases), labial brakes (35.00%), malocclusions (62.90%), and dental fluorosis (6.24% of students).

The national survey "State of oral health of the Algerian child aged 6 years, 12 years and 15 years" in 2013 reported that children do not brush their teeth in 42.6% (6 years) 32 % (12 years) and 27.6% (15 years). The oral hygiene of these children was considered to be bad in 32.6% of cases in children aged 6 years against 37.4% at 12 years and 38.8%. % of cases at 15 years. The overall prevalence of caries is 74.1% and 46.4% of children have localized gingivitis, more common at 12 years and 15 years than at 6 years. There is less dental fluorosis in children aged 6 than in children aged 12 and 15 (6% versus 15% and 14.5%) [7].

In the GALARNEAU C study, ARPIN S *et al.* [4] medium to high debris accumulation was observed in more than 85% of Grade 2 students while in Grade 6 96% of students presented debris They have at least one permanent or permanent tooth with reversible caries in 85% of cases in Grade 2 and 89% in Grade 6. Students have gingivitis in 50% of cases and gingival bleeding in one in five students in Grade 2 and almost one third in Grade 6. Fewer than one in 10 Grade 2 students have dental fluorosis on their permanent upper incisors and one in 10 students in Grade 6

According to GLICKMAN, [8] the prevalence of gingivitis at age 15 is 80%. CISSE D. *et al.* [9] reported that 73.4% of Comorian students had tartar, while 15.8% had healthy gums. The girls had a better periodontal state than the boys with (healthy gums: 21 vs 11, gingivorragia: 9.5 vs 12, tartar: 69.5 vs 77, p = 0.02).

ATTIN T. *et al.* [2] In a study of school children in a rural area in northwestern Cameroon, the prevalence of tooth decay was: 71.3% for 5-8 year olds, 78% for 9 year olds -12 years old, 92.7% for 13-17 year olds.

F. ZAOUI *et al.* [10] reported in their study a mild to moderate malocclusion of 29.5%, a gingival bleeding of 25.4% in urban areas against 20.3% in rural areas. Dental caries was found in 68.5% of males versus 65.8% of females. The 12-year CAD index is 2.26, with the rural child being slightly less affected than the urban one.

W.K Kalaajleh and A.C. Rima [11] found 50.9% of children aged 12 years with localized gingivitis and 12.3% with generalized gingivitis. The dental malpositions were mentioned in 40, 1% of the cases.

Philippe E, Pierre G. and Odile C [12]. in their study reported that at 12 years, the average CAO is 1.95 (± 0.14); 14.7% of children have a CAD> 5 and 1.6% a CAD> 10. However at 15 years the average CAO increases to 3.04 (± 0.23); 24.1% of children have a CAD> 5 and 8.5% a CAD> 10.

CONCLUSION

The Bamako school study revealed a high frequency of dental and periodontal diseases. Promotion, prevention and early detection of these pathologies are needed to improve the health and quality of life of schoolchildren in Bamako.

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