Oral health status of schoolchildren in Iasi – 2003-2004

Livia Mihailovici, Ioan Danila, Carmen Hanganu, Lucia Bârlean,
Alice Murariu, Iulia Saveanu
Iasi, Romania

Summary

The aim of this study is to assess the oral health status of children aged 7-12 years in Iasi, in order to evaluate, on a scientific basis, the preventive and restorative treatment needs for this age group. The study included 345 children aged 7-12 years, who were examined for the dental, periodontal and orthodontic status. The mean value of the dmft index was 3.24 in the primary dentition at the age of 7, and the DMFT was 2.35 in the permanent dentition at 12 years. More than 60% of all lesions were included in caries severity zones 1 and 2. Gingival bleeding affected 27% of the subjects, and the mean value of IOTN was 2. The authors concluded that it is necessary to continue and to extend the preventive programmes already started.

Key words: schoolchildren, DMFT, dmft, gingival inflammation, IOTN.

Introduction

Preventive approach is one of the most important trends in modern dentistry. Multiple medical, social and economic consequences of oral diseases and of their treatment require the adoption of preventive measures addressed to large population groups. A most important attention should be given to schoolchildren.

Over the past 20 years, a marked decline in the prevalence of dental caries has been observed in several industrialized countries, and this is particularly due to changing lifestyles and living conditions: reduced sugar consumption, improved oral hygiene practices, use of fluorides in toothpaste, fluoride mouthrinses or topical application, and systematic school-based preventive programmes. Such positive trends of lower dental caries experience in children have been observed also for some East European countries, but the general pattern is that the prevalence rate of dental caries in children has remained high in most developing countries [1, 2, 3]. This is caused by the economic and political changes in a time of transition, affecting health systems and, consequently, oral health systems.

Objectives

Epidemiological data on the oral health of the population are indispensable in planning, monitoring and realistic evaluation of the existing and future oral health services.

This study aims to assess the oral health status of schoolchildren aged 7-12 years in Iasi, in order to evaluate, on a scientific basis, the preventive and restorative treatment needs for this age group.

Material and method

The study included 345 children (152 boys and 193 girls) attending 1st to 6th forms of three schools in Iasi, who were examined in the Dental Service of the Municipal Polyclinic, at the Discipline of Oral Health.

The evaluation of oral health comprised the three main categories of elements determining it in children: dental status, periodontal status and orthodontic treatment needs [4, 5].

The method applied consisted in clinical examination, performed in the conditions of a usual dental office, using artificial light, mouth mirrors, dental explorers and periodontal explorers.

Data were collected in the records recommended by WHO for the evaluation of oral health status in children aged 6-12 years. The record contains:

– general information on the examined patient;

– dental status - synthesis of these data lead to the evaluation of caries experience indices in primary (dmf) and permanent (DMF) dentition, as well as of caries severity zones;

– periodontal status - evaluated considering only the gingival bleeding after probing for the upper and the lower central and lateral incisors and first permanent molars.

The authors added to this record the Index of Orthodontic Treatment Needs (IOTN), which is a 5 grades scale index:

– grade 5 = very high treatment needs;
– grade 4 = high treatment needs;
– grade 3 = limited treatment needs;
– grade 2 = low treatment needs;
– grade 1 = no treatment needs.

Results and discussions

Data concerning the indices of carious experience and their components in each age group are shown in *Table 1* and *Table 2*.

The mean value of the dmf index in primary teeth revealed a number of 3.24 affected teeth (decayed, missing or filled) per child at the age of 7 years; the mean number of affected surfaces was 8.10 *(Table 1)*.

The d-component (decayed teeth) weighted most, 93.2% of the dmft value, and this data is similar to the ones provided by other studies. This result reveals the low consideration that parents show to the carious lesions of primary teeth, as they think these teeth will anyway be eliminated. The high d-component implicates high complex dental treatment needs, as 40% of the carious lesions were complicated with pulp involvement.

Unlike this, the Restorative Index, which is the ratio ft/dmft x 100, was only 4%, reflecting the low use of dental therapy services, in spite of the obvious increase of the number of dental practitioners and dental offices in the last years and, especially, in spite of the fact that the implementation of social health insurances provides free-of-charge preventive and restorative dental treatments for the children aged bellow 18.

Age group	No.of children	dt	mt	ft	dmft	ds	ms	fs	dmfs
7 yrs	53	3.02	0.08	0.13	3.24	7.48	0.44	0.17	8.10
8 yrs	51	4.09	0.07	0.04	4.20	10.50	0.35	0.04	10.90
9 yrs	69	3.60	0.50	0.3	4.40	10.20	2.53	0.46	13.20
10 yrs	59	1.88	0	0.02	1.90	5.00	0	0.02	5.02

Table 1. Caries experience indices in primary dentition.

The mean DMF index in permanent dentition reflects the results of the im-plementation of the National Program-me for Prevention of Oral Diseases. Most of the examined children were included in this school-based programme, consisting in weekly mouthrin-ses with the fluoridated solution Fluo-rostom (containing 0.2% NaF).

Children aged 12 years had a mean number of 2.35 affected teeth per child, and the mean DMFS was 3.91 *(Table 2)*.

Similar to the primary dentition, the D-component weighted most (77.4% of the DMFT), whereas the Restorative Index was only 21.3% of the DMFT in children aged 12 years. The explanation lies in that the implementation of the National Preventive Programme leads to a decrease of the prevalence of carious lesions, but the treatment of the teeth already decayed requires health education programmes in order to improve the use of dental health care services. The recent implementation of a Dental Secondary Prevention Programme in the schools of Iasi will lead to a change of the observed DMF index components distribution in the future.

The distribution of the carious lesi-ons on different groups of teeth and surfaces is also very

Age group	No.	DT	MT	FT	DMFT	DS	MS	FSDM	FS
7 yrs	53	0.53	0	0.02	0.55	0.53	0	0.02	0.55
8 yrs	51	1.13	0	0.02	1.15	1.40	0	0.02	1.42
9 yrs	69	1.12	0	0.25	1.37	1.12	0	0.36	1.48
10 yrs	59	1.22	0	0.34	1.56	1.37	0	0.44	1.81
11 yrs	58	1.53	0.01	0.33	1.87	2.52	0.14	0.45	3.11
12 yrs	55	1.82	0.03	0.50	2.35	3.07	0.17	0.67	3.91

Table 2. Caries experience indices in permanent dentition

important, and from this point of view there are 4 caries seve-rity zones described: zone 1, which in-cludes caries-free teeth; zone 2 - inclu-des lesions in the pits and fissures of the molars and premolars; zone 3 - caries on the approximal surfaces of the canines, premolars and molars, and zone 4, which is the most severe and includes caries of the incisors and/or smooth surfaces.

Age group	Caries severity zones (%)							
	Primary teeth				Permanent teeth			
	1	2	3	4	1	2	3	4
7 yrs	10.9	4.1	42.2	42.8	88.1	9.7	1.1	1.1
8 yrs	8.8	1.6	57.6	32.0	72.0	24.8	2.0	1.1
9 yrs	9.1	5.1	47.2	38.6	54.0	30.3	9.6	6.1
10 yrs	9.0	10.3	46.6	38.8	30.6	32.8	20.1	16.4
11 yrs					35.1	30.6	20.1	14.2
12 yrs					27.6	36.2	21.4	14.8

Table 3. Caries severity zones in the examined group

Table 3 shows the distribution of these zones in the group of examined schoolchildren.

Caries severity zones 3 and 4 are more frequent in the primary dentition, which is mainly because of the secondary morphology of these teeth, showing reduced depth of the occlusal pits and fissures; zones 1 and 2 are predominant in the permanent dentition of children aged 7-10 years *(Table 3).*

Unlike the results of the study conducted by the WHO in Romania in 1992, when a serious damaging of the teeth was observed in children aged 11-12 years, as zones 3 and 4 weighted 50%, this study reveals important changes in the distribution of the lesions, shown by a proportion of more than 60% of zones 1 and 2.

Gingival inflammation affected 27% of the subjects; the highest values were observed in children attending 1st class, whereas in older children, who had better oral hygiene habits, gingival bleeding was less frequent *(Table 4).*

Age group	Gingival inflammation (% subjects)						
	Upper			Lower			Global
	CI	LI	M1	CI	LI	M1	
7 yrs	20.1	15.4	11.5	28.2	26.0	14.5	30.0
8 yrs	16.7	12.0	10.0	22.1	19.3	12.0	28.2
9 yrs	15.2	11.8	9.1	17.7	16.3	14.5	27.3
10 yrs	10.1	9.0	14.8	15.1	12.3	20.2	26.7
11 yrs	9.2	8.7	16.0	12.4	10.5	21.4	25.9
12 yrs	8.3	7.1	18.5	10.8	9.6	21.2	23.9

Table 4. Proportion of children affected by gingival inflammation

Zones most affected by gingival inflammation were also different from one age group to another: gingival bleeding of the anterior teeth was more frequent in younger children, while in children aged 11-12 years carious lesions of the posterior teeth caused the gingival inflammation of the first permanent molar.

Irrespective of the age group, most of the subjects had their lower teeth more frequently affected by gingival inflammation than the upper ones.

Analysis of the orthodontic treatment needs revealed a mean value of 2 for the IOTN, indicating reduced treatment needs (56.5% of the subjects). Very high orthodontic treatment needs (grade 5) was not observed in the examined group *(Table 5)*. Twelve of the children were wearing mobile orthodontic devices.

The study reveals some aspects of the oral health treatment needs in schoolchildren aged 7-12 years in Iasi. The high number of carious lesions in primary teeth indicates high restorative treatment needs. In the permanent dentition, the situation is much better than it was 10 years ago, as the DMFT was 4.1 [6] in 1992 and 2.7 in 2000 in the children aged 12 years [7]. Although the DMFT in the present study is not much higher than the value settled by the WHO objectives for the year 2010 (DMFT = 2 in children aged 12), the achievement of these objectives requires more complex preventive programmes. Local fluoridation with mouthrinses is efficient especially for the prevention of caries on the smooth surfaces and this aspect is pointed out by the results of this study, as caries severity zones 1 and 2 were predominant. However, approximately 90% of the carious lesions in children are located in the pits and fissures of the occlusal surfaces, because the complex primary morphology incre-ases their vulnerability to caries, especially in the first years after the eruption. The retentive anatomy of these surfaces allows neither a correct mechanical re-moval of the plaque, nor an efficient action of the fluorides in the process of remineralization, thus requiring a sealant protection. All the examined children who had an indication for this preventive method had their first permanent molars sealed immediately after the examination. In addition, the presence of the gingival inflammation in 27% of the children indicates the need for extended oral health education programmes, in order to improve their oral health knowledge and behaviours. Oral health education of the parents is also needed for the children better access to dental care services.

Age group	**IOTN**									
	5		**4**		**3**		**2**		**1**	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
7 yrs	0	0	0	0	3	0.9	30	8.7	20	5.8
8 yrs	0	0	1	0.3	3	0.9	28	8.1	19	5.5
9 yrs	0	0	2	0.6	5	1.5	37	10.7	25	7.3
10 yrs	0	0	0	0	2	0.5	35	10.1	22	6.4
11 yrs	0	0	1	0.3	2	0.5	34	9.9	21	6.0
12 yrs	0	0	1	0.3	3	0.9	31	9.0	20	5.8
Total	0	0	5	1.5	18	5.2	195	56.5	127	36.8

Table 5. Index of Orthodontic Treatment Needs in each age group

Conclusions

1. The index of caries experience had a mean value of 3.24 in the primary dentition of the children aged 7 years and 2.35 in the permanent teeth at the age of 12 years.

2. The D-component of the index was predominant in all the age groups, indicating a low use of dental care services.

3. Caries severity zones 3 and 4 were predominant in primary dentition, whereas caries-free teeth and pit and fissure caries were more frequent in children aged 11 and 12 years.

4. The prevalence of gingival inflammation (27%) requires oral hygiene education, especially in younger children.

5. Most of the examined children had a reduced orthodontic treatment need (IOTN = 2).

6. The results of the study reveal the necessity for continuous extended primary and secondary prevention programmes.

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Correspondence to: Dr. Livia Mihailovici, Assistant Professor, Discipline of Community Dentistry, Faculty of Dental Medicine, "Gr. T. Popa" University of Medicine and Phar-macy, Iasi. Faculty address: Universitatii Street, no. 16, Iasi, Romania. Home address: Vasile Alecsandri Street, no. 15, bl. I6, et. 3, ap. 10, cod 700054. E-mail: dcomunitara@yahoo.coms