

Caries Prevalence among 24 to 71-Month Old Children from Banja Luka

SUMMARY

Background: Despite the availability of a variety of preventive and treatment modalities, caries in the early childhood remains a serious and prevalent disease worldwide.

The aim of this study was to assess the prevalence of early childhood caries (ECC) among 24 to 71-month old children who attended the Center for preschool education Banja Luka, Republic of Srpska, Bosnia and Herzegovina.

Material and Methods: This was a cross-sectional study. The whole sample included 297 children of both genders. Caries status of each child was recorded using the dmft index according to the WHO criteria.

Results: Two hundred ninety-seven children (138 girls and 159 boys) 24 to 71-month old were examined. The overall prevalence of dental caries was 64.65%. Only 23 (7.74%) children had their teeth restored.

Conclusions: ECC prevalence among 24 to 71-month old children who attended the Center for pre-school education in Banja Luka is very high, but the problem is even greater because most of those caries lesions are untreated.

Key words: Preschool children, Early childhood caries, dmft index, Prevalence of dental caries

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Introduction

Despite the availability of a variety of preventive and treatment modalities, caries in early childhood remains a serious and prevalent disease worldwide¹⁻⁶. Unfortunately, one of the possible reasons can be misconception about primary teeth, because most of the people still think that deciduous teeth are irrelevant to the child's future oral health and health in general.

However, the impact of oral health on the organism in phase of growing and development is considerable. Deciduous teeth are of a great importance for the development of proper speech. Healthy primary teeth promote good chewing habits and facilitate nutritious eating. It has been shown that untreated dental caries associated with discomfort/pain affected weight gain, growth and the quality of life as well as the cognitive development of a child⁷⁻⁹. Healthy primary teeth have an impact on the positive social interactions, children's

self-esteem and promote confident smiles. Feitosa et al.¹⁰ reported that children with the severe dental caries in the early childhood, stated more frequently that they felt sad about their teeth, when compared to the caries-free children. In addition, the parents or guardians of children with caries reported that their children were ashamed to smile because of their teeth, while some stopped playing with other children for the same reason. Evidence also indicates that complications of early childhood caries (ECC) may result in lost workdays for the caregivers who have to stay at home to take care of their children or spend time and money to access dental care¹¹.

Furthermore, one of the major functions of healthy primary dentition is stimulation of jaw development and the proper placement of permanent teeth in the dental arches. Stahl and Grabowski¹² found a significant correlation between the prevalence of malocclusion and caries in mixed dentition. It is also established that the caries status in young permanent dentition is related to

the corresponding status in the deciduous dentition¹³. One of the best indicators for the development and caries risk assessment is previous caries experience. Children with caries in primary teeth are automatically classified into the group of high caries risk in permanent dentition¹⁴.

The aim of this study was to assess the prevalence of early childhood caries (ECC) among children (24 to 71-month old) who attended the Center for preschool education in Banja Luka, Bosnia and Herzegovina.

Material and Methods

This was a cross-sectional study conducted among preschool children who attended the municipality Center for preschool education in Banja Luka, Bosnia and Herzegovina. The study was approved by the Institutional review board of the Faculty of Medicine, University of Banja Luka. Written permission was obtained from the general director of the Center. From the list of 19 facilities, 3 were selected via cluster sampling.

The whole sample included 297 24 to 71-month old children (159 (53.53%) boys and 138 (46.47%) girls). Children were subdivided according to the age into younger kindergarten group (24 to 47-month old) - 113 (38.04%) children, and older kindergarten group (48 to 71-month old) - 184 (61.96%) children.

For the purpose of the study the research form was designed. It consisted of three parts: the first part contained questions related to generalities and parents' educational level, the second part represented the dental record and the third part was the informed consent.

Dental examination was performed under natural light by a single calibrated researcher using a dental mirror and explorer. Sterile gauze swabs were used to dry teeth and to remove debris. No radiographs were taken for any child. Dental status was recorded using the dmft index according to the WHO criteria¹⁵.

For the purpose of this study, ECC was defined using the AAPD criteria¹⁶, including the presence of one or more decayed (cavitated lesion), missing (due to caries) or filled teeth in primary dentition in a child younger than 71 months.

Data were analysed using the SPSS (Statistical Package for Social Sciences) version 17. The chi-squared test was used to test the association between two categorical variables. Values of $p < 0.05$ were considered statistically significant.

Results

The overall prevalence of the ECC in the sample was 64.65%. The prevalence of caries was 44.25% for children

aged 24 to 47 months and 77.17% for 48-71-month olds. Only 35.35% of the examined children were caries-free.

Older children had more teeth affected. It was found that 45.11% of them had 6 or more caries teeth ($\chi^2 = 56.576$; $p < 0.001$) (Table 1). The mean dmft index for the examined children was 3.94 and also increased with the age (mean dmft=2.36 for 24-47-month old, 5.03 for 48-71-month old).

Table 1. Distribution of the dmft index according to children's age

*dmft	Age of respondents					
	24 - 47 month old		48 - 71 month old		Σ	
	N	%	N	%	N	%
0	63	55.75	42	22.83	105	35.35
1	11	9.73	12	6.52	23	7.75
2-3	12	10.62	30	16.30	42	14.14
4-5	12	10.62	17	9.24	29	9.76
6 \leq	15	13.28	83	45.11	98	33.00
Σ	113	100.00	184	100.00	297	100.00

*dmft - d (decayed), m (missed), f (filled), t (teeth)

Only 23 (7.74%) children had their teeth restored (filled), and 9 (3.03%) had teeth extracted due to caries complications. No significant differences between younger and older kindergarten group were found regarding the prevalence of restored ($\chi^2 = 6.828$, $p > 0.05$) and extracted teeth ($\chi^2 = 5.329$, $p > 0.05$) (Table 2).

Table 2. Distribution of children according to tooth extraction/restoration

	Age of respondents					
	24 - 47 month-old		48 - 71 month-old		Σ	
	N	%	N	%	N	%
Children with extracted teeth due to caries						
Yes	1	0.88	8	4.35	9	3.03
No	112	99.12	176	95.65	288	96.97
Σ	113	100.00	184	100.00	297	100.00
Children with restored (filled) teeth						
Yes	3	2.65	20	10.86	23	7.74
No	110	97.35	164	89.14	274	92.26
Σ	113	100.00	184	100.00	297	100.00

The most affected teeth were mandibular molars. One hundred seventy-four respondents (58.58%) had at least one affected lower molar. One hundred thirty-six (45.79%) children had cavities on maxillary molars, while 85 (28.61%) and 26 (8.75%) had ECC on maxillary and mandibular frontal teeth.

No significant differences in ECC prevalence were found regarding the gender ($\chi^2 = 2.825$, $p > 0.05$, *Figure 1*), or mothers' ($\chi^2 = 7.774$, $p > 0.05$) and fathers' ($\chi^2 = 10.642$, $p > 0.05$) level of education (*Figure 2*).

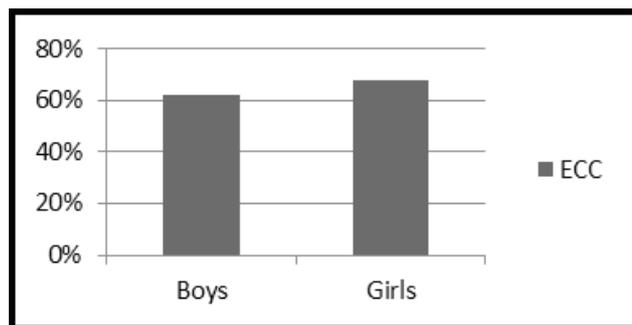


Figure 1. Distribution of children with ECC according to the gender

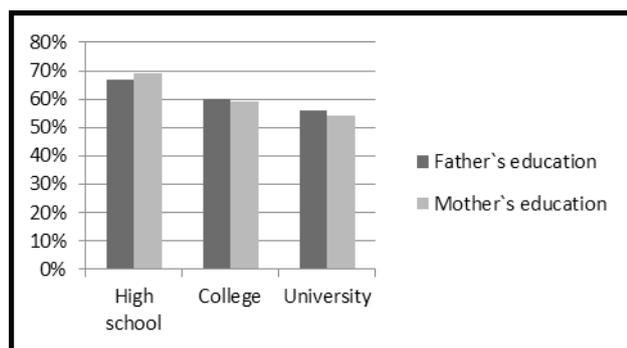


Figure 2. Distribution of children with ECC according to parent's education

Discussion

The beginning of the institutionalized work with children of preschool age in the city of Banja Luka began in 1949. Today, the public center for pre-school education in Banja Luka works on the principle of unified network of 19 facilities in different localities of the city. Approximately 2000 of children, which is 20% of the total number of pre-school children, is attending this pre-school institution. Despite the great importance of deciduous dentition, caries in primary teeth remains a serious concern in Banja Luka.

Many researches from developed countries showed a decline in prevalence of dental caries in permanent dentition¹⁷⁻¹⁹, but there is still no reliable data concerning caries prevalence in the primary dentition. A comprehensive review that included studies from Europe,

Africa, Asia, the Middle East and North America revealed that the prevalence of ECC in socially disadvantaged groups globally could be as high as 70%⁵.

Nilza et al.²⁰ found that among 8-48-month old children in India, ECC prevalence amounted 44%. The pooled national prevalence of the dmft index in China was found to be 65.5%²¹. Schroth et al.⁶ reported the overall prevalence of the ECC of 53.7% in Manitoba communities, which corresponds to our results. On the other hand, lower caries prevalence (20%) was found in Brazilian 3-4-year old preschoolers who attended municipal kindergartens²².

In the present study, the average number of affected teeth increased with the age. Close to our result, the mean dmft in Canadian children under six years of age was 4.2⁶. Especially high caries prevalence in primary teeth was recorded in six-year old children from rural North-Eastern Greece area (mean dmft=5.49)²³. On the other hand, lower incidence was found in five to six-year old children from England (dmft=1.47), Wales (dmft=2.38), and Scotland (dmft=2.16)²⁴. It was particularly surprising that, despite the existing pathology among young children in Banja Luka, little was done respecting the dental treatment.

The most affected teeth were mandibular molars, followed by maxillary molars, and the least vulnerable were mandibular frontal teeth. Multiple explanations can be given for such findings. Specific morphology of molars with pits and fissures and proximal contacts contribute to their vulnerability. On the other hand, mandibular incisors are guarded by the tongue and are constantly bathed in saliva. This may also be the reason for lower caries involvement of maxillary molars, which are closer to the excretory duct of the parotid salivary gland. Khan et al.²⁵ revealed that, in preschool children, mandibular first molars were the most caries affected teeth, followed by mandibular second molars and maxillary central incisors. Even in permanent dentition, Manji and Fejerskov²⁶ reported that mandibular molars were the most severely affected teeth.

This investigation showed no differences in the prevalence of ECC with respect to the level of parents' education. There is no systematic oral health education of parents in Banja Luka, so awareness of importance of dental health seems to be very low, regardless the educational level. Schroth et al.⁶ also demonstrated that ECC was not related to the educational level of caregivers. Opposite results have been reported by Filstrup et al.⁹ who demonstrated that parental education was often an indicator of the ECC.

Conclusions

Despite the fact that the Health Insurance Fond of Bosnia and Herzegovina covers full costs of dental care for children younger than 15-years, the ECC prevalence

is extremely high. The problem is even greater, because most of the lesions are untreated. The solution should be sought in oral health promotion and raising parental awareness about the importance of preserving the health of deciduous teeth.

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