



Early childhood caries predictors

Prediktori nastanka karijesa u ranom detinjstvu

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Abstract

Background/Aim. Dental caries represents a health problem of all ages, but it is especially significant in the earliest age of children. Early childhood caries can develop immediately after the eruption of deciduous teeth, resulting in many complications, such as tooth extraction, which is reflected in the quality of life and health. Early childhood caries is influenced by a large number of predictors. Considering that the data on predictors for the development of deciduous teeth caries are scarce, the aim of this paper was to determine the prevalence of deciduous teeth caries and detect the predictors for the development of early childhood caries. **Methods.** Our survey included 117 children of both genders, aged 3 to 6 years, from the territory of Kosovska Mitrovica and Zvečan. All respondents, including children and parents, were surveyed, and thus general data was obtained. A dental examination was performed on all children. The current state of dental health was inserted into special research cards that were in line with the recommendations of the World Health Organization. Those predictors of dental health level that were statistically significant in models of

univariate ordinal logistic regression at the significance level of 0.05 were included in the model of multivariate ordinal logistic regression. **Results.** According to the full structure, there were 49.6% of boys and 50.4% of girls. Healthy teeth were present in 25 (21.4%) children, 19 had reversible changes (16.2%), while 73 (62.4%) children had irreversible carious changes on teeth. The most important detected predictors were sweets consumption, sleeping with a baby bottle, 6 and more meals per day, frequent usage of medical syrups, child's daily tooth-brushing frequency, child's independent tooth-brushing frequency, usage of non-fluoride toothpaste, a lack of professional fluoride application, and mouth breathing. **Conclusion.** This research contributed to the detection of a large number of predictors that are most important for the development of early childhood caries. In order to reduce the risk of caries development, it is necessary to act in more spheres. This certainly requires planning and implementing preventive dental programs.

Key words:

child, preschool; dental caries; food and beverages; habits; oral hygiene; preventive dentistry; risk factors.

Apstrakt

Uvod/Cilj. Karijes zuba predstavlja problem u svim uzrastima, ali je posebno veliki kod dece u najmlađem dobu. Karijes mlečnih zuba se može javiti nakon nicanja zuba, dovodeći do nastanka komplikacija i ekstrakcije zuba, što se odražava na kvalitet života i zdravlje. Na nastanak karijesa u ranom detinjstvu utiče veliki broj prediktora. S obzirom na to da su podaci o prediktorima nastanka karijesa mlečnih zuba oskudni, cilj rada bio je da se utvrdi rasprostranjenost karijesa na mlečnim zubima i otkriju prediktori nastanka karijesa u ranom detinjstvu. **Metode.** Istraživanjem je bilo obuhvaćeno 117 dece starosti od 3 do 6 godina,

oba pola, sa teritorije Kosovske Mitrovice i Zvečana. Svi ispitanici su bili anketirani, uključujući i decu i roditelje, čime su dobijeni njihovi opšti podaci. Kod sve dece je izvršen stomatološki pregled, a zatečeno stanje zdravlja zuba uneseno je u posebne istraživačke kartone koji su bili u skladu sa preporukama Svetske zdravstvene organizacije. U model multivarijantne ordinalne logističke regresije bili su uključeni oni prediktori stepena zdravlja zuba koji su u modelima univarijantne ordinalne logističke regresije bili statistički značajni na nivou značajnosti od 0,05. **Rezultati.** Prema polnoj strukturi bilo je 49,6% dečaka i 50,4% devojčica. Zdrave zube imalo je 25 (21,4%), reverzibilne promene imalo je 19 (16,2%), dok je ireverzibilne promene

na zubima imalo 73 (62,4%) dece. Kao najznačajniji prediktori pokazali su se konzumacija slatkiša, spavanje sa flašicom, 6 i više obroka dnevno, česta upotreba medicinskih sirupa, učestalost dnevnog pranja zuba, učestalost samostalnog pranja zuba, upotreba pasti bez fluora, izostanak profesionalne fluorizacije i disanje na usta. **Zaključak.** Istraživanje je doprinelo otkrivanju velikog broja prediktora nastanka karijesa. Kako bi se smanjio rizik od

nastanka karijesa, neophodno je delovati u više sfera, što svakako zahteva planiranje i sprovođenje preventivnih stomatoloških programa.

Ključne reči:
deca, predškolska; zub, karijes; hrana i piće; navike; usta, higijena; stomatologija, preventivna; faktori rizika.

Introduction

Oral health has a high level of impact on general health and thus has a significant impact on the quality of life¹. Dental caries represents a chronic infective disease of extremely high prevalence in modern society and is created by the interaction of a large number of predisposing factors (predictors) over time. The most important predictors are the presence of acidogenic microorganisms capable of metabolizing free carbohydrates, frequent ingestion of carbohydrates, the quality of dental tissue, the quality and composition of saliva, behavioral characteristics of the individual, as well as numerous psychological, biological, ecological, and socioeconomic factors. All these factors are predictors for the occurrence of caries and its development².

Dental caries represents an extremely large problem at all ages, but it is especially prominent in children in the earliest years of life³. Deciduous teeth compared to permanent teeth are completely different in many aspects including morphology, histology, mineralization, and chemical composition; they are also different in the physiological aspect. The main differences exist due to the smaller percentage of mineral matter and lesser thickness of the deciduous teeth enamel. Studies have shown that deciduous teeth are significantly rich in organic matter, while the percentage of calcium and phosphorus is much lower than in permanent teeth⁴. Dental caries can occur very early on deciduous teeth, even 3–6 months after eruption⁵.

The occurrence of dental caries in young children is influenced by a large number of predictors. In the foreground, breastfeeding, bottle feeding, too frequent intake of saccharose-rich food (sweet and salty snacks, hidden carbohydrates), as well as the lack of adequate oral hygiene by parents or caregivers are on the forefront⁶. Other risks include dietary habits, the transmission of cariogenic pathological microorganisms, especially from parents or caregivers, hygienic habits, family values, tradition, and lifestyle⁷. The carious lesion does not occur suddenly; it passes through numerous development stages, starting from non-cavitated carious lesions in the form of white or brown spots to the presence of cavitation of varying degrees. Carious lesions are also followed by many complications such as the loss of vitality of dental pulp, presence of periapical pathological processes, abscesses, and teeth extraction, which are the worst outcomes⁸.

Because of the complex dental caries etiology and the lack of data relating to the earliest age, it is considered that any additional research contributes to the detection of the risk factors for caries occurrence in the youngest age and, therefore, the possibility of prevention⁹. Moreover, one of the conclusions of an internal seminar of the European Academy of Paediatric Dentistry, held in 2016 in Brussels, whose main topic was dealing with the treatment of early carious lesions of deciduous and young permanent teeth, was that more studies which include deciduous dentition are necessary for more precise data¹⁰.

Since the data on predictors for caries development of the deciduous teeth are scarce, the aim of this study was to determine caries distribution on deciduous teeth and assess possible predictors for dental caries development in very young children.

Methods

The sample for this study consisted of 117 children of preschool age. The children were between 3 and 6 years old, of both genders, attending preschools on the territory of Kosovska Mitrovica and Zvečan, regardless of where they live. After informing the management of preschool institutions about the public health significance of this research and obtaining their permission for its implementation, children's parents, who also participated in the study, were informed in written form. The study included only children of parents who agreed to participate in the research. All respondents were interviewed, and the state of the health of their deciduous teeth was determined by an objective clinical examination.

The study was implemented according to the principles of good clinical practice, following domestic and international legal and ethical norms as well as the Helsinki Declaration of Human Rights, and with the approval of the Ethics Committee of the Faculty of Medicine of the University of Priština/Kosovska Mitrovica, Serbia.

The survey provided general data on respondents, including examined children and parents. Data were obtained regarding pregnancy, nutrition during pregnancy, fluoride use, and regular visits to the dentist, as well as data on the state of parents' oral health, including their habits and level of awareness of oral health. The survey included data related to the history of infants and young children, with special emphasis on nutrition, bad habits,

oral hygiene, tooth eruption, use of fluoride preparations, visits to the dentist, and early medical history.

Dental examination was performed using a dental mirror and a graduated Community Periodontal Index (CPI) probe, with artificial light sources. These methods are fully in line with the recommendations of the World Health Organization (WHO) for examining oral tissues. Accordingly, the WHO advises using a plane dental mirror, artificial light sources (in blue-white colour spectrum) for better detection of structural changes on oral tissues, and using the CPI probes on white or chalky spots on the teeth, which are not soft to touch ¹¹. Sterile cotton pads and portable air-dryers were used to remove soft deposits from the teeth and dry them.

In terms of obtaining data on caries prevalence, a decay-missing-filled (DMF) index (DMF for deciduous dentition) was also used.

Dental caries prevalence data were recorded in a research card that was specially designed for this study. The research card was in line with the WHO recommendations ¹². The following nosological units were diagnosed and numerically recorded: a healthy tooth (0), a tooth with a present reversible carious lesion, i.e. a white or dark spot (1), and a tooth with clinically determined cavitation or irreversible carious lesion (2).

Statistical analysis of data

Statistical data analysis was performed using IBM SPSS Statistics 22 (IBM Corporation, Armonk, NY, USA). The results were presented as a frequency (numerical and percentage). The χ^2 test and the Fisher test were used to

examine the differences between the nominal data. A Kruskal-Wallis test was used to process ordinal data. Numerical data with normal distribution were analyzed by variance analysis. Predictors that influence the level of tooth health were analyzed by a univariate and multivariate ordinal logistic regression. All *p*-values less than 0.05 (*p* < 0.05) were considered statistically significant.

Results

The survey included 117 children. The children were 3 to 6 years old. According to the gender structure, there were 49.6% of boys and 50.4% of girls. The sociodemographic characteristics of the examinees are shown in Table 1. Healthy teeth were present in 25 (21.4%) children, 19 (16.2%) had reversible changes (white and brown spots), while 73 (62.4%) children had irreversible carious lesions on their teeth cavitated lesions.

The peculiarities of the pregnancy that were considered concerning the normal course of pregnancy, illnesses and the use of drugs in pregnancy, the type of mother's nutrition, and regular visits to the dentists, did not affect the level of oral health of children.

Based on the obtained results, the characteristics of nutrition, such as the length and frequency of breastfeeding, or the duration of baby bottle usage, showed that they did not affect the level of oral health. Children with irreversible teeth lesions had significantly 6 and more meals per day (*p* = 0.001). The degree of teeth lesions was associated with more frequent consumption of sweets (*p* < 0.001). Children with irreversible carious lesions were more often breathing on their mouth during sleep (*p* < 0.001), which can be seen in Table 2.

Table 1

Sociodemographic characteristics of children and their parents					
Variables	Total	Healthy teeth	Cariou lesions		<i>p</i>
			reversible	irreversible	
Gender					
male	58 (49.6)	11 (44.0)	9 (47.4)	38 (52.1)	
female	59 (50.4)	14 (56.0)	10 (52.6)	35 (47.9)	0.768
Age of the child (years)	4.7 ± 0.5	4.6 ± 0.5	4.7 ± 0.5	4.8 ± 0.5	0.241
Professional qualifications (mother)					
secondary education	61 (52.1)	14 (56.0)	10 (52.6)	37 (50.7)	
highly qualified	56 (47.9)	11 (44.0)	9 (47.4)	36 (49.3)	0.899
Professional qualifications (father)					
secondary education	66 (64.1)	13 (59.1)	10 (55.6)	43 (68.3)	
highly qualified	37 (35.9)	9 (40.9)	8 (44.4)	20 (31.7)	0.527

All values are given as number (percentage) of children or mean ± standard deviation.

Table 2

Variables	Total	Healthy teeth	Cariou lesions		<i>p</i>
			reversible	irreversible	
Dietetic regime and habits of children					
Nutrition of infants					
natural	95 (81.2)	22 (88.0)	17 (89.5)	56 (76.7)	0.364
artificial	22 (18.8)	3 (12.0)	2 (10.5)	17 (23.3)	
Breastfeeding duration					
to 20 min	92 (83.6)	21 (87.5)	15 (83.3)	56 (82.4)	0.933
longer than 20 min	18 (16.4)	3 (12.5)	3 (16.7)	12 (17.6)	
Daily breastfeeding intakes					
4–8	88 (79.3)	23 (95.8)	14 (77.8)	51 (73.9)	0.055
over 8	23 (20.7)	1 (4.2)	4 (22.2)	18 (26.1)	
Children slept on breast	23(20.5)	4 (16.7)	2 (11.1)	17 (24.3)	0.474
Baby bottle usage					
until 6 months	8 (9.4)	3 (15.8)	0 (0.0)	5 (9.1)	0.093
until 12 months	51 (60.0)	13 (68.4)	10 (90.9)	28 (50.9)	
longer	26 (30.6)	3 (15.8)	1 (9.1)	22 (40.0)	
Six and more meals a day	38(32.5)	3(12.0)	2(10.5)	33(45.2)	0.001
Sweets					
no	10 (8.5)	6 (24.0)	2 (10.5)	2 (2.7)	< 0.001
rarely	80 (68.4)	19 (76.0)	16 (84.2)	45 (61.6)	
often	27 (23.1)	0 (0.0)	1 (5.3)	26 (35.6)	
Sleeping with baby bottle	56 (47.9)	3 (12.0)	5 (26.3)	48 (65.8)	< 0.001
Mouth breathing	39(33.3)	4(16.0)	1(5.3)	34(46.6)	< 0.001

All results are shown as number of children (percentage).

Fluoride tablets were given to children in only 5.1% of cases and did not show any effects on the oral health of the children ($p = 0.261$). Children with healthy teeth and reversible lesions were significantly more frequently subjected to professional fluoridation by dentists (24.0% and 21.1%) compared to children with irreversible tooth changes (8.2%) ($p < 0.001$). Children with irreversible carious lesions were significantly more commonly using a toothpaste without fluoride ($p < 0.001$). Four percent of children with healthy teeth brushed their teeth once a day; reversible carious lesions were present in 15.8% of children and irreversible carious lesions in 43.8% of children, which was a statistically significant difference

($p < 0.001$). Sixty percent of children with irreversible carious lesions brushed their teeth independently, without parental control ($p < 0.001$) (Table 3). Eight percent of children with healthy teeth used medical syrups more than 5 times a year; 5.3% of children were with reversible tooth changes, and 31.5% of children were with irreversible tooth changes, which is a statistically significant difference ($p = 0.007$). Twelve percent of children with healthy teeth were sleeping with a baby bottle; 26% of children were with reversible carious lesions changes, and 66% of children were with irreversible carious lesions, which was a statistically significant difference ($p < 0.001$).

Table 3

Variables	Total	Healthy teeth	Cariou lesions		<i>p</i>
			reversible	irreversible	
Use of fluoride tablets in children	6 (5.1)	0 (0.0)	0 (0.0)	6 (8.2)	0.261
Professional fluoride application	16 (13.7)	6 (24.0)	4 (21.1)	6 (8.2)	< 0.001
Use of non-fluoride toothpaste while brushing	36 (30.8)	3 (12.0)	1 (5.3)	32 (43.8)	< 0.001
Frequency of tooth brushing - daily					
once a day	35 (29.9)	1(4.0)	3 (15.8)	31 (42.5)	0.001
twice a day	73 (62.4)	20 (80.0)	15 (78.9)	28 (52.1)	
three and more	8 (6.8)	4 (16.0)	1 (5.3)	3 (4.1)	
Child brushes teeth independently					
no	19 (16.2)	6 (24.0)	8 (42.1)	5 (6.8)	< 0.001
sometimes	53 (45.3)	18 (72.0)	11 (57.9)	24 (32.9)	
yes	45 (38.5)	1 (4.0)	0 (0.0)	44 (60.3)	
Use of medical syrups during a year					
never	18 (15.4)	6 (24.0)	4 (21.1)	8 (11.0)	0.007
rarely	73 (62.4)	17 (68.0)	14 (73.7)	42 (57.5)	
more than 5 times	26 (22.2)	2 (8.0)	1 (5.3)	23 (31.5)	
Teeth eruption in proper time	103 (88.0)	24 (96.0)	16 (84.2)	63 (86.3)	0.393

All results are shown as number (percentage) of children.

The model of multivariate ordinal logistic regression included tooth health level predictors in children who were statistically significant at a significance level of 0.05 in models of a univariate ordinal logistic regression. The model contains 9 predictors listed in Table 4. The entire model (with all predictors) was statistically significant ($p < 0.001$) (Table 4).

In the model of multivariate ordinal logistic regression, statistically significant predictors of the tooth health level in children were a higher incidence of sweets consumption ($p = 0.023$), a lesser frequency of tooth-brushing per day ($p = 0.049$), and a higher frequency of autonomous tooth-brushing in children ($p = 0.049$).

Table 4

Multivariate ordinal logistic regression with the level of dental health as the dependent variable

Variables	Multivariate ordinal logistic regression	
	OR (95%CI)	<i>p</i>
Sweets	4.4 (1.2–15.6)	0.023
Sleeping with baby bottle	2.3 (0.8–7.1)	0.142
6 and more meals per day	3.2 (0.8–12.7)	0.106
Medical syrups usage frequency	1.8 (0.8–4.0)	0.176
Daily frequency of child's tooth-brushing	0.3 (0.1–1.0)	0.049
Frequency of child's independent tooth-brushing	3.1 (1.4–7.0)	0.006
Tooth-brushing with non-fluoride toothpaste	3.6 (0.9–13.8)	0.064
Professional fluoride application lack	2.9 (0.8–10.9)	0.117
Mouth breathing	2.6 (0.7–9.0)	0.135

OR – odds ratio; CI – confidence interval.

Discussion

Deciduous teeth caries, known as early childhood caries (ECC) ¹³, represents a serious health problem worldwide, especially in developing countries ¹⁴. This is supported by the data from Tušek et al. ^{15, 16}, who showed that the prevalence of caries in Vojvodina was 46.64%, while it was 62.4% in children involved in this study. Their data show that the distribution of caries between sexes is different, which in our sample was not the case. This study analyzed the prevalence of ECC and its relationship with behavioural, nutritional, and hygienic factors as the risk factors for disease presence. ECC prevalence of 62.4% in northern Kosovo was on a higher level of moderate values of prevalence compared to Sweden (low prevalence - 11.4%) ¹⁷ and the recorded lower prevalence in children from Southwest China ¹⁸, (85%), and in Canada (high prevalence - 98%) ¹⁹. Studies from the neighboring countries stated that 40.29% of the children had ECC and our data values were on a higher level, which is troubling ¹⁵. Reversible carious lesions were found in 16.2% of mostly younger children, which is connected to the fact that the level of ECC is directly dependent on age ¹⁶. If treatment is not approached in a timely manner and in the right way, not only can ECC negatively affect all aspects of the child's health, but it can also significantly increase the possibility of caries in permanent dentition ^{17, 18}. ECC is a disease for which the treatment is not just restorative. Prevention of caries based on predictor detection and risk management are important concepts in epidemiological

studies of ECC ¹⁹. According to the classic understanding of the etiology of early childhood caries, it is considered a multifactorial disease that includes bacterial, dietary, and host-related determinants, intertwined with numerous sociological and environmental factors ^{20, 21}. Studies that have dealt with detecting predictors for the development of deciduous teeth caries have yielded very diverse results connected with breastfeeding, feeding on the bottle ²², and inadequate dietary habits in very young children ²³. The presence of cariogenic microorganisms ²⁴, the frequency of consumption of beverages and food ^{25, 26}, the level of oral hygiene ^{27, 28}, the level of parental education, but also the involvement of parents in the maintenance of oral hygiene of

children, as well as the use of fluoride toothpaste ²⁹ play an extremely important role. Each additional examination and detection of the predictors for the occurrence of ECC contributes to more effective prevention of this disease, which was the main idea of this study.

The oral health of preschoolers is often a neglected aspect of general health in children. These children are a unique part of the population that is extremely receptive to caries, primarily because of their dependence on parents, limited manual abilities, and lack of understanding the oral health importance. There are data from previous studies that clearly show that parents play a central role in preserving the oral health of children, starting from developing awareness of how important oral health is, including brushing children's teeth, forming quality nutrition, and eliminating bad habits ^{29, 30}.

It can be said that at the right age, habits related to tooth-brushing and proper nutrition can be easily transferred from parents or caregivers to children with everyday usage. Additionally, in order to improve oral hygiene and quality of life, education for both parents and children is necessary ³¹.

Observing the individual effects of predictors, it can be concluded that a large number of examined variables show significance, which certainly supports the notion that caries is a disease of extremely complex etiology.

The results show that the parental level of education is not related to the health of children's teeth, which corresponds to data obtained in our previous research ³². Our results related to the impact of maternal education are completely identical to the results of the study ³³, which has

shown that there is no correlation between the level of mother's education and the state of children's oral health. Certain data obtained by this study are in contradiction with the results of some other authors. This is primarily related to the frequency of caries in girls and boys. The obtained results showed that the incidence of reversible and irreversible carious lesions cannot be related to the child's gender, which is contrary to the results obtained in Canada³⁴ and India³⁵. Moreover, according to the data obtained, the time of birth, pregnancy, and the use of drugs during pregnancy showed no effects on caries incidence in children. The data obtained regarding the use of fluorinated water, which is related to lower incidence of caries, appear in full accordance with the results obtained in the United States³⁶.

The results of this research, related to the child's nutritional habits, showed that caries incidence, whether the lesion was reversible or irreversible, was on a high level in those children who used a baby bottle in their nutrition, had more than six meals a day, were sleeping with a baby bottle, and who consumed extra sugar or beverages, which is in full accordance with the data obtained in other studies³⁷⁻³⁹. For comparison, similar data were obtained in the research by Tušek et al.¹⁵ for a region of the province of Vojvodina. Although all of these factors are extremely important and work together, special importance is given to the effect of sleeping with a baby bottle. The results showed that the presence of caries in children who practiced this habit was at a high level, which can be explained by decreased salivation during sleep, which reduces the self-cleaning mechanism, and by a constant inflow of nutrients into the oral cavity, which results in a constant decrease of pH value of the oral cavity. Therefore, it is considered that children should only use water during the night with a baby bottle⁴⁰.

A review of the results obtained in this study related to oral hygiene maintenance in children provides a clear picture that adequate oral hygiene significantly determines the possibility of carious lesion occurrence in preschool children. First of all, this refers to the beginning of tooth-brushing, parental involvement in the maintenance of oral hygiene, the use of fluoride toothpaste, and the frequency of tooth washing, which coincides with the results obtained in other studies⁴¹. However, although all of these factors are significant and affect one another, special importance is given to the fact that the higher frequency of caries is visible in those children who lack the help of parents in maintaining oral hygiene, which is closely related to the underdeveloped manual abilities in preschool age, but also underdeveloped awareness of the importance of oral health. It is a fact that parents play a central role in the lives of children and in acquiring habits; however, it is also considered that teachers and babysitters should be educated about the importance of oral health, proper nutrition, and oral hygiene maintenance. This is because they are considered to have an extremely good effect in creating awareness of healthy nutrition and hygiene of mouth and teeth³². It should also be noted that changing children's and parents' habits is an extremely challenging

task, especially for pediatric and preventive dentists³². The obtained data show that professional fluoridation significantly contributes to the preservation of teeth health, which is in line with the results of similar research^{42,43}.

Mouth breathing, which is one of the bad habits, is also one of the caries predictors⁴⁴. The exact mechanism is not completely clarified, but this is considered a risk factor due to the dehydration of the teeth surface and the absence of the protective effect of the saliva⁴⁵.

Studies carried out in Turkey also indicate an increased caries risk in children who have often used medical syrups. Higher caries prevalence in children who use medical syrups more often is connected to industrial sugar presence in syrups⁴⁶. The connection between higher ECC prevalence and the frequent usage of medical syrups is also shown in data collected in Vojvodina^{15,16}.

With every degree of more frequent sweets consumption, children had a 4.4 times higher chance of worsening every teeth health level, with the control of all other factors in the model. With every minor degree of tooth-brushing, children had a 70% higher chance of worsening any teeth health level, with the control of all other factors in the model. With every degree of more frequent autonomous tooth-brushing, children had a 3.1 times more chance for worsening every stage of teeth health, with the control of all other factors in the model.

Conclusion

The results of this research, as well as the results of many other studies worldwide, undoubtedly show that caries is quite prevalent in preschool children, and its occurrence is influenced by a large number of interconnected predictors. However, the most important predictors were sweets consumption, daily frequency of tooth-brushing, frequency of independent tooth-brushing in children, frequency of medical syrups use, breathing on the mouth, sleeping with a baby bottle, tooth-brushing with fluoride-free toothpaste, six or more meals per day, as well as the absence of professional fluoridation of teeth.

Predictors identified as the most important, i.e. nutritional and factors related to oral hygiene maintenance and bad habits, are readily subject to correction with adequate access and education. This can, therefore, significantly affect the oral health of this sensitive population, which would result in reducing early childhood caries incidence and providing a better quality of life.

In order to reduce the risk of caries development, it is necessary to act in more spheres, starting by educating parents, children, and preschool institutions staff, which certainly requires planning and implementing preventive dental programs.

Conflict of interest

The authors have no actual or potential conflicts of interest to disclose, related to this manuscript.

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