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Original Research Article

The role of parental education and socioeconomic status in dental caries prevention among Lithuanian children

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ABSTRACT

Background and objective: The aim of this study was to disclose parental attitudes toward their children's dental care and preventive measures used as well as to evaluate their associations with parental education and socioeconomic status.

Materials and methods: A total of 1248 parents of 7-, 9-, and 12-year-old children from 5 largest Lithuanian cities were enrolled in the study. The questionnaire comprised 34 items, which were grouped into 4 clusters.

Results: The parents with a high educational level scored better than those who had a low educational level (2.13 [SD, 0.39] vs. 2.2 [0.43], $P = 0.002$). The parents who reported sufficient-family income scored their child's and their own health significantly better than those reporting insufficient-family income (2.02 [SD, 0.37] vs. 2.27 [SD, 0.41], $P < 0.001$). The parents cared about their child's health more than about their own (1.53 [SD, 0.51] vs. 2.15 [0.61], $P < 0.001$). The parents with a high educational level and those receiving sufficient income cared about education on oral hygiene and regular preventive dental check-ups more than those with a low educational level and insufficient income (36.7% and 40.8% vs. 30.2% and 28.7%, $P < 0.01$ and $P < 0.001$, respectively). The children whose parents had a high educational level brushed their teeth 2 times a day more frequently than those of the parents with a low educational level (48.5% and 42.4%, respectively, $P < 0.001$).

Conclusions: Greater attention to children's dental care as well as keeping their teeth healthy was paid by the parents with a high educational level and sufficient income.

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1. Introduction

The preservation of healthy teeth is one of the key health issues in childhood. The World Health Organization (WHO) evaluates the influence of various risk factors on health and pays great attention to monitoring of oral health status and its worsening because these factors can cause worse quality of life and overall health [1].

Dental caries is one of the main oral diseases in childhood and adolescence. Dental caries causes complications that lead to costly and time-consuming treatment [2]. Numerous studies carried out in different countries over the world have shown that the application of preventive measures and improvement of social environment considerably reduce dental caries rates [3-9].

Dental caries-caused pain, discomfort, and costly treatment procedures are the main factors associated with stress and unpleasant experiences among children and adults [10]. Epidemiological studies have demonstrated that dental caries rates can be successfully controlled by the improvement of oral hygiene status [11-14].

Family, i.e., parental attitudes toward the importance of oral hygiene, plays a major role in the preservation of healthy children's teeth. Family creates an environment necessary for healthy lifestyle, increases self-confidence, and helps habit formation [15]. Parental skills and attitudes toward oral hygiene may have an impact on the formation of their children's oral hygiene habits and the prevalence of oral diseases [16]. Moreover, studies have reported that parental education and family income have a direct impact on children's oral health [17,18]. Low-education and low-income families do not pay enough attention to dental care measures and regular preventive visits to a dental professional, and this results in the development of dental caries [19]. In Lithuania, only few studies investigating parental attitudes toward their children's oral health issues have been carried out [7,16]. Such studies help disclose parental attitudes and provide possibilities to correct the factors improving their children's oral health. Therefore, the aim of this study was to disclose parental attitudes toward their children's dental care and preventive measures used as well as to evaluate their associations with parental education and socioeconomic status.

2. Materials and methods

The study was conducted from January to May 2010. The schools for the study were selected from the alphabetic list of all the schools in 5 largest Lithuanian cities based on the data of the education management information system of the Centre of Information Technologies in Education (the second school from the beginning and the end of the list as well as from the middle; 15 schools in total; two classes of each age group in selected schools). The exact number of schoolchildren was retrieved from the data of Statistics Lithuania; the sample size was calculated using the Paniott's formula. In total, 1869 questionnaires were given to randomly selected 7-, 9-, and 12-year-old schoolchildren at school in order to be delivered to

their parents and answered at home; 1248 questionnaires were returned with a response rate being 66.8%. No further attempts were made to get the completed questionnaires from the nonresponders.

Permission to carry out the study was obtained from the Bioethics Committee (No. BE-2-19, November 4, 2009).

The parents were surveyed by the questionnaire in order to find out how the respondents rate their own and their child's health and dental status. Furthermore, the study aimed to disclose what measures were applied to personal oral care, what were the reasons to visit a dentist, and how frequent the visits were.

Family income per one person was assessed subjectively by answering the question if family income was sufficient with 4 response options available: completely sufficient, sufficient, insufficient, and completely insufficient. According to the respondents' responses about family income, 2 groups were formed: group 1, sufficient or completely sufficient income ($n = 566, 45.3\%$) (sufficient income further in the text) and group 2, insufficient or completely insufficient income ($n = 682, 54.7\%$) (insufficient income).

The parents were also categorized into 2 groups according to their education: group 1 included the parents with a college or higher education ($n = 773, 62.0\%$) (parents with a high educational level), and group 2 included the parents with an incomplete secondary, secondary, vocational school, etc. education ($n = 475, 38.0\%$) (parents with a low educational level).

A significantly greater percentage of the respondents with better education reported that family income was sufficient as compared with those who were worse educated (52.8% and 33.0%, respectively, $P < 0.001$).

A 34-item questionnaire to interview schoolchildren's parents was constructed. The questions were grouped into 4 clusters. The questions in the first cluster were of general queries regarding education, family income, etc. The questions in the second cluster were aimed to disclose how the respondents evaluate their own and their child's health and dental status and whether they care about their own and their child's oral health. A standard scale of answers was chosen: 1, very good/care very much; 2, fairly good/care sufficiently; 3, moderate/care a little; 4, fairly bad/do not care; and 5, bad/do not care at all. The questions of the third cluster were asked to find out about measures used for personal oral care, knowledge about them, and reasons for visits to dentists and their frequency. The questions in the fourth cluster aimed to reveal parental attitudes toward the prevention program. The internal consistency reliability of the questionnaire was 0.751 (Cronbach's alpha coefficient).

Statistical data analysis was conducted using SPSS 16. The data were analyzed using descriptive statistics, and hypotheses on differences in means and interdependence of variables were verified. The chi (χ^2) criterion was used to evaluate interdependence of qualitative variables. Quantitative variables were compared by using analysis of variance (ANOVA) with post hoc Bonferroni-corrected comparisons. Cronbach's alpha was used to estimate the internal consistency reliability of the questionnaire. Binary logistic regression analysis was employed, and odds ratios (ORs) with their 95% confidence intervals (CI) were calculated [20]. The level of significance of 0.05 was chosen to assess the statistical hypotheses.

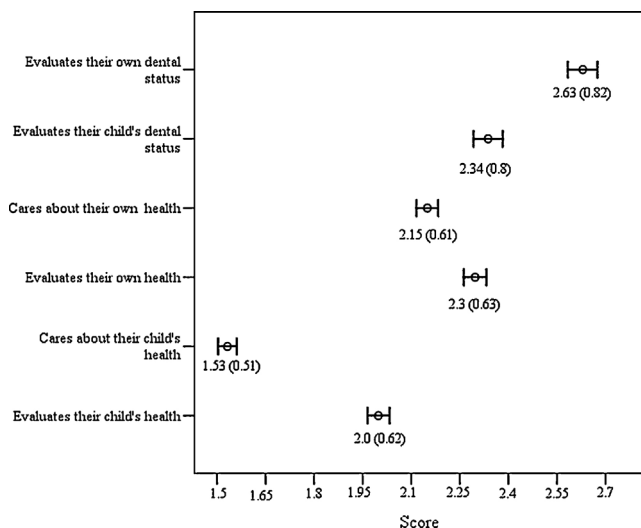


Fig. – Evaluation of children's and parents health and dental status by the questionnaire (values are mean (SD). Error bars represent 95% confidence intervals).

3. Results

The results showed that the parents gave the best score to care about their child's health and their own dental status was scored the worst (Fig.).

The survey revealed that the respondents rated their own and their child's health as well as dental status as fairly good with a mean score being 2.15 (SD, 0.41; range, 1–3.67; median, 2.17). The parents with a high educational level scored better than those who had a low educational level (2.13 [SD, 0.39] vs. 2.2 [0.43], $P = 0.002$). The parents who reported sufficient-family income scored their child's and their own health significantly better than those reporting insufficient-family income low-income (2.02 [SD, 0.37] vs. 2.27 [SD, 0.41], $P < 0.001$). The parents cared about their child's health more than about their own (1.53 [SD, 0.51] vs. 2.15 [0.61], $P < 0.001$).

The results of the study showed that a child visited a dentist (general dental practitioner or dental hygienist) during the last year 2.5 times (SD, 2.3) on the average, and 6.9% of the respondents pointed out that their children had no visits to a dentist. The children of the parents with a low

educational level visited a dentist more frequently than those with a high educational level (2.71 times [SD, 2.8] vs. 2.37 times [SD, 2.02]; $P = 0.002$). Moreover, there was a significant difference in the number of visits to a dentist with regard to family income: children from insufficient-income families visited a dentist 2.67 times (SD, 2.68) on the average, and those from sufficient-income families, 2.3 times (SD, 1.85) on the average ($P = 0.004$).

In the study, it was important to disclose the most common reasons to visit a dentist. The results showed that the children from insufficient-income families (62.8%) visited a dentist for dental treatment significantly more frequently (Table 1).

Education on oral hygiene and regular preventive dental check-ups are important in order to prevent oral diseases. The answers of the respondents showed that parents with a high educational level and those receiving sufficient income cared about these issues more than those with a low educational level and insufficient income (36.7% and 40.8% vs. 30.2% and 28.7%, $P < 0.01$ and $P < 0.001$, respectively). In order to preserve the occlusal surfaces of teeth, sealants, known as caries-preventive agents, are applied. This preventive measure was more frequently applied to children whose parents had a high educational level (30.0% vs. 22.8%, $P < 0.005$).

Binary logistic regression analysis revealed that children whose parents had a high educational level and children from sufficient-income families were 1.344 (95% CI, 1.053–1.717) and 1.71 (95% CI, 1.351–2.164) times, respectively, more likely of having a preventive dental check-up. Moreover, the likelihood of having dental sealants was 1.453 (95% CI, 1.116–1.892) times greater among children whose parents with a high educational level. Children from insufficient-income families were at a greater risk of being treated for dental caries (OR, 1.152; 95% CI, 1.158–1.822).

The survey showed that the most common source of information on dental care for a child was his/her parents (91.8%) followed by teachers (35.4%), television and the Internet (26.0%), but there were no significant differences comparing the groups.

A greater percentage of children whose parents had a high educational level received information on personal oral hygiene measures and their application from dental professionals than that of children from low-income families (73.5% and 58.0%, respectively, $P < 0.001$).

In order to find out oral hygiene habits, the parents were asked how frequently their child brushes his/her teeth (Table 2).

Table 1 – The distribution of 7-, 9-, and 12-year-old children by the reasons of visits to a dentist and by parental education as well as family income.

Reasons of visits ^a	Family income			Parental education		
	Sufficient	Insufficient	P	High educational level	Low educational level	P
Preventive check-up	231 (40.8)	196 (28.7)	<0.001	284 (36.7)	143 (30.2)	0.018
Dental treatment	304 (53.7)	428 (62.8)	0.001	439 (56.8)	292 (61.6)	0.094
Application of fissure sealants	152 (26.9)	188 (27.6)	0.078	232 (30.0)	108 (22.8)	0.005

Values are number (percentage).

^a More than one answer was possible.

Table 2 – The distribution of 7-, 9-, and 12-year-old children by the frequency of tooth brushing and preventive measures applied as well as by parental education level.

Variable	Parental education		P
	High educational level	Low educational level	
Frequency of tooth brushing			$\chi^2 = 13.456, df = 2, P < 0.001$ ***P < 0.005
Twice a day	375 (48.5)*	201 (42.4)*	
Once a day	350 (45.3)	218 (45.8)	
Several times a week	48 (6.2)**	56 (11.8)**	
Preventive measures			P = 0.012
Applied	224 (33.0)	104 (25.7)	
Nonapplied	453 (67.0)	300 (74.3)	

Values are number (percentage).

The answers of the respondents showed that the children whose parents had a high educational level brushed their teeth 2 times a day more frequently than those of the parents with a low educational level (48.5% and 42.4%, respectively, $P < 0.001$). Greater percentages of the children whose parents had a low educational level and from insufficient-income families brushed their teeth several times a week as compared with those of the parents with a high educational level and from sufficient-income families (11.8% and 10.3% vs. 6.2% and 6.0%, respectively, $P < 0.001$ and $P = 0.02$). The likelihood of brushing teeth 2 times a day was greater for the children of the parents with a high educational level (OR, 1.28; 95% CI, 1.016–1.611).

Analysis of the data obtained from this questionnaire-based survey showed that 98.5% of the children used fluoridated toothpaste, 21.8% used dental floss, and 23.0% sugar-free chewing gum. Dental floss was used more often by the children whose parents had a high educational level and by the children from sufficient-income families as compared with the children of the parents with a low educational level and from insufficient-income families (26.1% and 27.0% vs. 14.8% and 17.4%, respectively, $P < 0.001$ and $P < 0.001$). Sugar-free chewing gum as one of the dental caries-preventive measures was used more frequently by the children of the parents with a high educational level than their counterparts whose parents had a low educational level (25.5% and 19.0%, $P < 0.05$).

Even 81.9% of the parents knew that one of the proven anti-carries measures was fissure sealants applied to molars and that it was important to retain child's teeth healthy. Only 26.3% of the respondents reported that other dental caries-preventive measures (fluoride gel and varnish) were used. Preventive dental caries measures (fluoride gel and varnish) were applied more frequently to the children those parents had a high educational level (33.0%) ($P < 0.01$) and sufficient income (33.6 proc.) ($P < 0.02$). Being a child of parents with a high educational level and from sufficient-income family was associated with a 1.42-fold (95% CI, 1.079–1.869) greater likelihood to receive preventive measures.

4. Discussion

Since parents play an important role in the formation of their children's oral hygiene habits, this study aimed at disclosing

parental attitudes toward children's dental care. The answers obtained showed that parents rated both their own and their children's health as fairly good and reported that cared about it sufficiently. Such an opinion can be subjective, but according to Jürgensen et al., the better general health status is perceived, the better dental status is achieved [21]. A Norwegian study by Kuposova et al. reported that parental education and socioeconomic status had an impact on child's oral health [22]. Low parental education is considered as one of the predisposing factors leading to poor child health, including oral health. Moreover, parental educational levels have been reported to be directly associated with family socioeconomic status [17]. These data are in line with the findings of other studies as well [18,23]. Children whose parents had socioeconomic problems and poorer parent-teacher associations and children with poorer school attendance, worse behavior, and higher consumption of confectionery were found to have more dental caries-affected teeth [24–26]. Inadequate, poor nutrition has a considerable impact on the development of dental caries as well. Schoolchildren love snacking, do not follow healthy dietary habits, and like sticky, sweet food, and all these will have a negative impact on their teeth [14,21,27,28]. Insufficient parental education and low-socioeconomic status contribute to poor dietary habits and unhealthy lifestyles [21,26,29].

Parental attitudes toward oral health depend on their education. The study carried out by Rajab et al. reported that better educated parents cared more about their children's oral health [30]. In the presence of high-socioeconomic status, better oral health is experienced, and lower dental caries rates can be achieved [1,31]. Moreover, oral health was better in those children who had regular dental check-ups and brushed their teeth from young years [23]. These dental visits are important as during them, oral diseases can be diagnosed, managed, and even avoided on time, and personal oral hygiene guidelines can be constantly reminded to dental practice visitors [21,32]. However, the same study by Rajab et al. reported that only 11% of the 7- to 12-year-old children visited a dental professional for routine check-ups. At the last visit to the dentist, 48%–59% of the responders had dental treatment and tooth extraction and 8% received preventive procedures (fissure sealing) [30]. Some studies have highlighted that low-socioeconomic status families visit a dentist more frequently due to pain or discomfort [13,21,27]. This is confirmed by the finding of our study as well.

A Japanese study by Okada et al. demonstrated inter-relationships between parents' oral health behavior and oral health of their school-aged children [33]. Parental oral hygiene habits and their attitudes toward oral hygiene are very important in children's oral health [34]. Children from lower social status families have worse oral hygiene habits [27,35]. This is confirmed by the results of our questionnaire-based survey, which showed that parents with a higher educational level and higher income knew more about the preventive dental caries program aiming to keep one's teeth healthy. Moreover, these parents were more interested in the oral hygiene of their children. Therefore, it can be stated that all these factors may have an influence on taking care of child's oral health status, formation of appropriate oral hygiene habits, and routine check-ups with a dentist. It has been reported that children from low-income families were less likely to have dental visits to a dental care specialist and were less likely to have dental sealants [36].

The analysis of published studies has shown that in order to reduce dental caries rates, preventive measures or programs are being implemented in numerous countries [3-5,8,10], which are more effective and easily accessible for low-income families [28,36]. Topaloglu-Ak et al. state that a first step to prevent dental caries is the implementation of a national health program involving promotional, preventive, and minimally interventional approaches [37]. Current science in the management of dental caries advocates a clear emphasis on the reduction of plaques, remineralization, and application of minimally invasive restorative methods [38].

In Lithuania, the dental caries prevention program in order to preserve the occlusal surfaces of molars is being implemented; therefore, we conducted the questionnaire-based survey with the aim of disclosing parental attitudes toward this issue. Our survey has shown that parents do not have sufficient knowledge about the benefits of sealants in keeping child's molars healthy and it is a reason why they do not bring their children to a dental practice. Most probably due to this, dental treatment, not preventive measures, was the most common reason for a visit to a dentist.

The countries that successfully implemented preventive programs monitoring children's oral health up to the age of 18 years achieved good results in the field of dental caries prevention. Denmark, where 98% of children visit a dental professional for regular check-ups up to the age of 18 years, is well known for very good dental status in the general population [39]. The preventive measures applied are various, but the expected result is the only one, i.e., to reduce the rate of dental caries experience. Tooth brushing with fluoridated toothpaste is considered as the simplest measure to prevent dental caries [6,9].

Therefore, while implementing preventive dental caries programs, it is of paramount importance to comprehensively analyze the current situation and find the best solution. Parents play a key role in their children's oral health care: child's oral health and his/her participation in oral health programs are highly affected by parental education, knowledge, and socioeconomic status [17]. In order to protect and preserve children's oral health, more attention should be paid to health promotion policy, which considers social, economic, and environmental factors, affecting child's dental status. This

study has shown that parental education and socioeconomic status play an important role in children's dental care; therefore, the priority should be given to low-income and low-socioeconomic status families. With the aim at evaluating an impact of educational level and socioeconomic status on child's oral status, the study including a clinical assessment of schoolchildren's dental status would be purposeful.

5. Conclusions

Greater attention to children's dental care as well as keeping their teeth healthy was paid by the parents with a high educational level and sufficient income. The application of preventive dental caries should be focused on children, their oral hygiene habits, and lifestyles, and this could be achieved by complex prevention programs being implemented at schools and being targeted at lower-socioeconomic status families.

Conflict of interest

The authors state no conflict of interest.

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