

VISUOMENĖS SVEIKATA

Associations between parental skills and their attitudes toward importance to develop good oral hygiene skills in their children

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Key words: children; skills; oral hygiene; caries prevention.

Summary. *Background.* For many years, poor oral hygiene and frequent consumption of sugars is known as key behavioral risk factors for oral diseases, such as dental caries and periodontal disease. Parental attitudes toward children's oral health could be associated with their own oral health skills. We aimed to analyze associations between parental skills and attitudes toward caries development and possibilities to control positive oral health behavior in their children.

Material and methods. A cross-sectional study involved 550 parents of 3- to 4-year-old children. A 40-item questionnaire was developed from the Theory of Planned Behavior, Health Belief Model and the Health Locus of Control model, and parental attitudes toward dental caries in their children were analyzed.

Results. A total of 397 filled-in questionnaires were collected; the response rate was 72%. Parents with good own oral hygiene skills significantly more often understood the importance of brushing their children's teeth ($\chi^2=29.8$; $df=1$; $P<0.001$). Study results highlighted also significant differences in importance to prevent tooth decay ($\chi^2=3.1$; $df=1$; $P=0.051$), importance to control sugar snacking ($\chi^2=10.6$; $df=1$; $P=0.001$), and parental perceived seriousness of tooth decay in children ($\chi^2=9.2$; $df=1$; $P=0.002$) comparing parents with poor and good oral hygiene skills. Differences in parental efficacy to control proper toothbrushing and parental efficacy to control sugar snacking in children were not significant comparing both groups.

Conclusions. More than half (61%) of the parents have reported appropriate own oral hygiene skills. Parental attitudes toward children's oral health were significantly associated with their own oral health behavior and understanding the importance of development of oral hygiene skills in their children.

Introduction

Poor oral hygiene and frequent consumption of sugars is known for many years as key behavioral risk factors for oral diseases, such as dental caries and periodontal disease (1–4). Dental caries occur because of demineralization of enamel and dentine by organic acids produced by bacteria in dental plaque through the metabolism of sugars derived from diet (4–6). Dental caries also affects preschool age children's growth and well-being (7, 8). Behaviors adopted by individuals can make a negative or positive contribution to health. Parental knowledge and attitudes toward oral health can promote appropriate oral hygiene skills in their children (3, 9–12). There is

evidence that good parental knowledge and oral hygiene positively affects children's dental health (13–18). Toothbrushing less than twice daily and sugar snacking between meals have been identified as key behavioral factors explaining the presence of dental caries in children (2, 9, 19).

Children are more likely to be caries free if their teeth are brushed from an early age, twice daily with fluoride toothpaste, with parental involvement and in an environment in which the frequency of sugar intake is controlled (19, 20). In contrast to this parenting skills approach, health education models have dominated in the majority of caries prevention strategies (21). However, the evidence that this has been an effective

approach is not strong (22, 23). Parental attitudes toward caries development and prevention are likely to predict positive behavior of twice-daily toothbrushing. Since this is the main factor that health education is likely to influence, the value of a purely educative approach continues to be questionable in achieving behavior change. However, findings consistently demonstrated that parents' self-belief (parental efficacy) to ensure twice-daily toothbrushing and control sugar snacking in their children was predictive of toothbrushing and sugar snacking behavior, but we are still lacking an evidence for association between parental skills and attitudes in the development of good oral hygiene skills in children.

The aim of this study was to analyze associations between parental oral hygiene skills and attitudes toward the importance of development of good oral hygiene skills in their children.

Methods and materials

Study design

A cross-sectional study design was used.

Sample size

Sample size was calculated using EpiInfo 2000 Statcalc software, and sample represented Kaunas region population (Lithuania). Previous studies showed a response rate of 67% (12, 14, 16). Therefore, it was decided to distribute the questionnaires to 550 parents. In total, we collected 397 filled-in questionnaires; the response rate was 72%.

Questionnaire

The questionnaire consisted of 40 items concerning parental and their children's oral health behaviors that was developed from the Theory of Planned Behavior (24), Health Belief Model (25), and the Health Locus of Control (26–28) model, and parental attitudes toward dental caries in their children (9) were also included seeking to investigate how parental attitudes may impact their children's behaviors. Parental skills were assessed according to answers on own oral hygiene skills regarding the use of an appropriate toothbrush, toothbrushing twice a day or more often, use of sugar snacks, and frequency of visits to oral hygienists.

Data collection and statistical analysis

The data were collected through the questionnaires filled in by the parents of 3–4-year-old children. The data were computed-coded and analyzed using the

Table 1. Reliability of factors included into the model

Parental attitudes	Reliability (Cronbach's alfa)
Understood importance to brush teeth in children	0.61
Parental efficacy to control proper toothbrushing in children	0.74
Importance to prevent tooth decay	0.77
Importance to control sugar snacking in children	0.83
Parental efficacy to control sugar snacking in children	0.74
Perceived seriousness of tooth decay in children	0.69

Statistical Package for the Social Sciences for Windows, version 10.0 (SPSS Inc). Pearson's χ^2 test was used for evaluation of the statistical significance at the $P < 0.05$ level. All answers were summarized by giving equal weight for each of the correct answers. The mean values were used to define groups of comparison, and then the groups were compared by parental oral hygiene skills and attitudes toward children's oral health.

The factors included into the final model were previously assessed for reliability (Table 1). The data on sociodemographic characteristics of respondents and their oral health behaviors were additionally collected.

Results

Of the 397 respondents, 320 (80.4%) were females and 77 (19.6%) were male. The age ranged from 21 to 65 years (mean age, 33.1 ± 6.94 years). Average household incomes per capita in families with self-reported good and poor parental oral hygiene skills were 511.65 ± 270.21 Lt and 466.71 ± 263.11 Lt, respectively. The mean number of children in families with good and poor parental oral hygiene skills was 1.56 ± 0.6 and 1.59 ± 0.7 children per family, respectively. All other descriptive characteristics are shown in Table 2.

Regarding parental skills in own oral hygiene, our study showed that more than half (52.6%) of the parents use an appropriate toothbrush. Altogether, 69.7% of the parents were brushing their teeth twice a day or more often as it is recommended. Most of parents (77.7%) reported inappropriate use of sugar snacks. Study results highlighted that most of the parents

Table 2. Descriptive characteristics of parents who responded to questionnaire

Characteristic	Good own oral hygiene skills		Poor own oral hygiene skills	
	<i>N</i>	%	<i>N</i>	%
Gender				
Male	38	15.7	39	25.2
Female	204	84.3	116	74.8
Age				
≤29 years	101	41.7	61	39.4
30–40 years	114	47.1	76	49.0
≥41 years	27	11.2	18	11.6
Marital status				
Single	13	5.4	14	9.0
Married	201	83.8	117	75.5
Divorced	23	9.6	18	11.6
Widowed	3	1.2	6	3.9
Education				
Primary	8	3.3	6	3.9
Secondary	36	14.9	24	15.5
College	75	31.0	52	33.5
University	123	50.8	73	47.1

Table 3. Associations between parental oral hygiene skills and attitudes toward children's oral health

Attitude		Good own oral hygiene skills (<i>N</i> =242)		Poor own oral hygiene skills (<i>N</i> =155)		χ^2	<i>P</i> value
		<i>N</i>	(%)	<i>N</i>	(%)		
Understood importance to brush teeth in children	Good	213	88.0	101	65.2	29.8	<0.001
	Poor	29	12.0	54	34.8		
Parental efficacy to control proper toothbrushing in children	Good	217	89.7	130	83.9	2.9	0.062
	Poor	25	10.3	25	16.1		
Importance to prevent tooth decay	Good	182	75.2	104	67.1	3.1	0.051
	Poor	60	24.8	51	32.9		
Importance to control sugar snacking in children	Good	145	59.9	67	43.2	10.6	0.001
	Poor	97	40.1	88	56.8		
Parental efficacy to control sugar snacking in children	Good	172	71.1	107	69.0	0.2	0.373
	Poor	70	28.9	48	31.0		
Perceived seriousness of tooth decay in children	Good	216	89.3	121	78.1	9.2	0.002
	Poor	26	10.7	34	21.9		

(71.5%) had visited an oral hygienist at least once during the last year.

Using Pearson's test, associations between parental attitudes toward tooth decay in their children and own oral hygiene skills were analyzed (Table 3). Parents with good own oral hygiene skills significantly more

often understood the importance of brushing their children's teeth ($\chi^2=29.8$; $df=1$; $P<0.001$). Study results also highlighted significant differences in importance to prevent tooth decay ($\chi^2=3.1$; $df=1$; $P=0.051$), importance to control child sugar snacking ($\chi^2=10.6$; $df=1$; $P=0.001$), and parental perceived seriousness of tooth

decay in children ($\chi^2=9.2$; $df=1$; $P=0.002$) comparing the parents with poor and good oral hygiene skills. Parental efficacy to control proper toothbrushing and parental efficacy to control sugar snacking in children was higher in the group of parents with good oral hygiene skills; however, the differences were not significant.

Discussion

This study showed that more than half of the parents reported appropriate own oral hygiene skills; 52.6% of the parents use an appropriate toothbrush. Altogether, 69.7% of the parents were brushing their teeth twice a day or more often as it is recommended. According to parental habits, our study results are in accordance to earlier study on Lithuanian population (20), which showed that half of the parents brush their teeth irregularly and only 14% of the parents brushed their children's teeth. However, 12.0% of the parents refuse to include their children in preventive program on dental caries without known reasons. Our study revealed that parental attitudes toward their children's oral health were significantly associated with positive parental oral health behavior. According to this, parental attitudes toward oral health should be considered an essential factor influencing the development of positive health-related behavior in children. Oral diseases are clearly related to the behavior, and it is expected that the prevalence of dental caries and periodontal disease would decrease with the improvements in attitudes and oral hygiene skills. This also could have an influence on decreasing the prevalence of dental caries in child teeth (29). The most common and effective way to promote children's oral hygiene is parental supervision and development of child skills for regular toothbrushing together with parental control of sugar consumption; therefore, brushing is recommended to be adopted as a habit, which should be repeated every morning and evening, at least twice a day. Earlier studies demonstrated a high correlation between the frequency of toothbrushing and OHI-S (by Green-Vermillion) index (30). Therefore, special emphasis on parental own attitudes, skills, and knowledge of why and how often toothbrushing should occur and why sugar should be controlled should be placed in the development of healthy lifestyle behaviors in their children. When parents improve their oral hygiene skills by themselves, their children accept this healthy behavior more easily. It is hypothesized that people who have assimilated healthy behavior and feel a sense

of personal control over their oral health are more likely to have positive attitudes and adopt proper self-care practices in their relatives (29, 31). With our study, we can confirm these hypotheses by discovering significant associations between parental own oral hygiene skills and attitudes. This study proposed evaluation criteria based on theoretical models developed from the Theory of Planned Behavior (24), Health Belief Model (25), and the Health Locus of Control (26–28) model for evaluation of parental own oral hygiene skills and attitudes such as understood importance to brush child teeth, importance to prevent tooth decay, importance to control child sugar snacking, and perceived seriousness of tooth decay in children.

Methodological strengths of the present study include the sufficient sample size, methodological background, and availability of comparable survey instruments. This study design, although scientifically less rigorous than the longitudinal studies, is less time and resource consuming. In the present study, data were gathered at one point in time from the same population, but not from the same household individuals. Lack of information about non-respondents precludes any conclusion about a possible selection bias, although the response rates seem to be high enough to ensure that the target population is reflected with a reasonable degree of accuracy (32).

Further research is needed to evaluate in prospective studies whether parental attitudes is more favorable in establishment and maintenance of positive oral health behaviors in children. Furthermore, it would be an advantage to repeat a cross-sectional survey, with the same target population and sampling frame, as it is the most appropriate and straightforward design for providing a series of survey estimates by which changes in a population can be monitored over periods of time (32, 33). Trend studies of oral health-related behaviors, using a repeat cross-sectional design, have previously been reported in testing the changes in oral health and lifestyle (34).

Conclusions

More than half (61%) of the parents reported appropriate own oral hygiene skills. Parental attitudes toward children's oral health were significantly associated with their own oral health behavior and understanding the importance of development of oral hygiene skills in their children.

Taisyklingi burnos higienos įgūdžiai šeimoje ir jų sąsaja su tėvų požiūriu į vaikų burnos higienos įgūdžių lavinimą

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Raktažodžiai: vaikai, burnos ertmės sveikata, eduonies profilaktika.

Santrauka. *Išvadas.* Nepakankama burnos ertmės higiena yra vienas pagrindinių dantų eduonies ir periodonto ligų rizikos veiksnių. Tėvų įgūdžiai ir požiūris į burnos ertmės higieną gali turėti įtakos jų vaikų higienos įgūdžiams ir burnos ertmės ligų paplitimui. Šio tyrimo tikslas – įvertinti sąsają tarp tėvų burnos higienos įgūdžių ir jų požiūrio į vaikų burnos higienos įgūdžių lavinimą ir svarbą.

Tyrimo tipas. Momentinis tyrimas, kuriame dalyvavo 550 tėvų.

Metodai. Buvo adaptuotas 40 klausimų standartizuotas klausimynas, apimantis gyvenimo ir sveikatos edukologijos tyrimuose taikomas skales.

Rezultatai. Klausimynus užpildė 397 tėvai, atsakas – 72 proc. Vaikų dantų valymo svarbos suvokimas statistiškai reikšmingai ($\chi^2=29,8$; $lfs=1$; $p<0,001$) labiau paplitęs tarp tėvų, kurių burnos higienos įgūdžiai buvo geri. Tyrimo duomenys parodė statistiškai reikšmingus skirtumus tarp geros ir blogos burnos higienos įgūdžių tėvų grupių šiose srityse: dantų eduonies profilaktikos svarbos ($\chi^2=3,1$; $lfs=1$; $p=0,051$); cukraus vartojimo kontrolės svarbos ($\chi^2=10,6$; $lfs=1$; $p=0,001$) ir tėvų suvoktos dantų eduonies įtakos vaikų sveikatai ($\chi^2=9,2$; $lfs=1$; $p=0,002$). Tėvų požiūris į gebėjimą kontroliuoti taisyklingą vaikų dantų valymo įgūdžių lavinimą ir tėvų gebėjimas kontroliuoti cukraus vartojimą tėvų grupėse statistiškai reikšmingų skirtumų nenustatyta.

Išvados. Daugiau kaip pusė (61 proc.) tėvų buvo priskirti gerus burnos higienos įgūdžius turinčių grupei. Tėvų požiūris į taisyklingų burnos higienos įgūdžių lavinimą buvo susijęs su pačių tėvų burnos higienos įgūdžiais bei tėvų požiūriu į burnos higienos įgūdžių ugdymo svarbą vaikams.

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References

1. King NM, Wu II, Tsai JS. Caries prevalence and distribution, and oral health habits of zero- to four-year-old children in Macau, China. *J Dent Child (Chic)* 2003;70(3):243-9.
2. Levy SM, Warren JJ, Broffitt B, Hillis SL, Kanellis MJ. Fluoride, beverages and dental caries in the primary dentition. *Caries Res* 2003;37(3):157-65.
3. Mattila ML, Rautava P, Aromaa M, Ojanlatva A, Paunio P, Hyssala L, et al. Behavioural and demographic factors during early childhood and poor dental health at 10 years of age. *Caries Res* 2005;39(2):85-91.
4. Zaborskis A, Milčiuvienė S, Bendoraitienė E, Zaborskytė A. Oral health behaviour of adolescents: a comparative study in 35 countries. *Baltic Dent Maxillofac J* 2005;6(2):44-50.
5. Musaiger AO. Food habits of mothers and children in two regions of Oman. *Nutr Health* 1996;11(1):29-48.
6. Pine CM, Adair PM, Petersen PE, Douglass C, Burnside G, Nicoll AD, et al. Developing explanatory models of health inequalities in childhood dental caries. *Community Dent Health* 2004;21(1 Suppl):86-95.
7. Sheiham A. Dental caries affects body weight, growth and quality of life in pre-school children. *Br Dent J* 2006;201(10):625-6.
8. Milčiuvienė S, Matulaitienė Z, Narbutaitė J, Vaitkevičienė V, Bendoraitienė E, Timofejeva I. Kauno miesto moksleivių burnos būklės ir odontologinės pagalbos analizė. (Dental status among schoolchildren in Kaunas and analysis of oral health care.) *Medicina (Kaunas)* 2006;42(5):413-23.
9. Adair PM, Pine CM, Burnside G, Nicoll AD, Gillett A, Anwar S, et al. Familial and cultural perceptions and beliefs of oral hygiene and dietary practices among ethnically and socio-economically diverse groups. *Community Dent Health* 2004;21(1 Suppl):102-11.
10. Ekman A, Holm AK, Schelin B, Gustafsson L. Dental health and parental attitudes in Finnish immigrant preschoolchildren in the north of Sweden. *Community Dent Oral Epidemiol* 1981;9(5):224-9.
11. Tickle M, Milsom KM, Humphris GM, Blinkhorn AS. Parental attitudes to the care of the carious primary dentition. *Br Dent J* 2003;195(8):451-5.
12. Mattila ML, Rautava P, Sillanpää M, Paunio P. Caries in five-year-old children and associations with family-related factors. *J Dent Res* 2000;79(3):875-81.
13. Tetuan T. The role of the nurse in oral health. *Kans Nurse* 2004;79(10):1-2.
14. Jankovic B, Ciglar I, Knezevic A, Juric H, Bukovic D, Stanicic T. Caries and oral hygiene in children in postwar Novi Travnik (Bosnia and Herzegovina) and Zabok (Croatia). *Coll Antropol* 2004;28(1):439-45.
15. Oredugba FA, Savage KO. Comparative study of oral hygiene status of HbSS subjects and controls. *Afr J Med Med Sci* 2004;33(2):127-30.

16. Wennhall I, Matsson L, Schroder U, Twetman S. Caries prevalence in 3-year-old children living in a low socio-economic multicultural urban area in southern Sweden. *Swed Dent J* 2002;26(4):167-72.
17. Ramos-Gomez F, Jue B, Bonta CY. Implementing an infant oral care program. *J Calif Dent Assoc* 2002;30(10):752-61.
18. Taani DQ. Relationship of socioeconomic background to oral hygiene, gingival status, and dental caries in children. *Quintessence Int* 2002;33(3):195-8.
19. Harris R, Nicoll AD, Adair PM, Pine CM. Risk factors for dental caries in young children: a systematic review of the literature. *Community Dent Health* 2004;21(1 Suppl):71-85.
20. Vaitkevičienė V, Milčiuvienė S, Zaborskis A. Kauno miesto ikimokyklinio amžiaus vaikų burnos higiena ir jų tėvų požiūris į vaikų burnos sveikatą. (Oral hygiene of preschool children in Kaunas city and their parents' attitude towards children's oral health). *Medicina (Kaunas)* 2005;41(5):427-34.
21. Watt RH. Congenital heart disease: an overview of the condition and treatment options. *Lippincotts Case Manag* 2004; 9(4):205-8.
22. Kay E, Locker D. A systematic review of the effectiveness of health promotion aimed at improving oral health. *Community Dent Health* 1998;15(3):132-44.
23. Kay EJ, Locker D. Is dental health education effective? A systematic review of current evidence. *Community Dent Oral Epidemiol* 1996;24(4):231-5.
24. Aizen I. The theory of planned behavior. *Organ Behav Hum Decis Process* 1991;50:179-211.
25. Rosenstock IM, Strecher VJ, Becker MH. Social learning theory and the Health Belief Model. *Health Educ Q* 1988; 15(2):175-83.
26. Ludenia K, Donham GW. Dental outpatients: health locus of control correlates. *J Clin Psychol* 1983;39(6):854-8.
27. Wallston BS, Wallston KA, Kaplan GD, Maides SA. Development and validation of the health locus of control (HLC) scale. *J Consult Clin Psychol* 1976;44(4):580-5.
28. Wallston KA, Wallston BS, DeVellis R. Development of the Multidimensional Health Locus of Control (MHLC) Scales. *Health Educ Monogr* 1978;6(2):160-70.
29. Al Ansari J, Honkala E, Honkala S. Oral health knowledge and behavior among male health sciences college students in Kuwait. *BMC Oral Health* 2003;3(1):2.
30. Zaborskyte A, Bendoraitiene A. Oral hygiene habits and complaints of gum bleeding among schoolchildren in Lithuania. *Stomatologija* 2003;5(1):31-6.
31. Freeman R, Breistein B, McQueen A, Stewart M. The dental health status of five-year-old children in north and west Belfast. *Community Dent Health* 1997;14(4):253-7.
32. Astrom AN, Masalu JR. Oral health behavior patterns among Tanzanian university students: a repeat cross-sectional survey. *BMC Oral Health* 2001;1(1):2.
33. Duncan G, Kalton G. Issues of design and analysis of surveys across time. *Int Statist Rev* 1987;55:97-117.
34. Astrom AN, Samdal O. Time trends in oral health behaviors among Norwegian adolescents: 1985-97. *Acta Odontol Scand* 2001;59(4):193-200.

Received 12 December 2007, accepted 4 September 2009

Straipsnis gautas 2007 12 12, priimtas 2009 09 04