

Children's poor toothbrushing behavior and mothers' assessment of dental health education at well-baby clinics

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The purpose of the study was to investigate which factors in the child's environment are associated with poor toothbrushing behavior in 3-year-old children. Mothers' attitudes towards dental education at well-baby clinics and the relation of this attitude to children's toothbrushing frequency were also studied. The population sample was obtained by means of stratified cluster sampling of all primigravid women in the study area. The data were collected from the women by structured questionnaires and patient cards from dental well-baby clinics. The present study led to the following conclusions: a) new approaches are needed to make rural populations appreciate the benefits of oral hygiene; b) young mothers need support in their personal and in their children's dental health care; c) each family expecting their first child needs a basic amount of counseling. Health-conscious parents must be supported in the maintenance of their health habits; and d) the provider of the basic counseling has no significant role in the formation of health habits. □ *Dental health education; family environment; toothbrushing*

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Several studies have shown that mothers' attitudes towards the knowledge of children's dental care may be deficient and unfavorable for good care (1-9). Focusing of health education on families and, especially, on mothers during pregnancy and immediately after the child's birth has been found an effective way of promoting oral health in children.

Over the 2 decades that the dental health clinics have operated in Finland, dental health in children has improved so much that, globally, the country is now among the best in this respect. The current period of austerity places heavy pressure on the clinics both quantitatively and qualitatively. Although few 3-year-old children have caries, the condition develops rapidly in early childhood, and treatment is difficult. Early identification of families in which good habits do not succeed would be most important to target health education more effectively.

Each Finnish municipality is obliged to organize a well-baby clinic system that, according to the Public Health Act of 1972, also must provide dental health care education (10). At the time of the present study dental health education was offered by most municipalities to families when they were expecting a child and when the child was 6, 12, and 24 months old. Almost all families visit the clinics, which are free of charge.

Counseling was provided in most municipalities when the mother and the child came to see a doctor or a health nurse. Each health authority has its own instructions about the services of the clinics, but they share a few basic principles in their approach: 1) toothbrushing should be started immediately after eruption of teeth; the first toothbrush is provided by the clinic; 2) the use of sugar should be controlled; especially nighttime juice should be avoided; and 3) the use of fluoride tablets should be adjusted to the fluoride

content of local drinking water. Fluoride tablets (Fluorilette®, 0.25 mg F) are available free of charge from either a clinic or a pharmacy. Attention is also paid to the use of the dummy (pacifier).

In an earlier study it was shown that every fifth 3-year-old has poor toothbrushing frequency and that the frequency is a good measure of other dental health-related habits at this age (11).

The purposes of this study were to investigate 1) background factors of poor toothbrushing habits. The dental health education at well-baby clinics was evaluated by studying 2) the mothers' attitudes towards the clinic activities and the correlation of this attitude to the child's toothbrushing. 3) The associations between the provider of health counseling and dental health habits of the child were also studied.

Subjects and methods

Subjects

The present study is part of the Finnish Family Competence Study aimed at improving preventive health care targeted at families. The study sample is representative of families in the provinces of Turku and Pori, Finland, who are expecting their first child. The population sample of the present study has been described in an earlier study (12).

Methods

The data were collected from structured questionnaires and patient cards of dental well-baby clinics. The questionnaires, which mothers received when the child was 1.5 and 3 years old, contained questions dealing with the dental health education at the well-baby clinics and dental health habits. Variables describing children's dental health habits included addition of sugar to food and use of juice at night at the age of 1.5 years and toothbrushing and frequency of sweets and fluoride consumption at the age of 3 years. The dental well-baby clinic data were collected at public dental care clinics at the time of the first examination at the age of 3 years and sent to the author. Well-baby clinic data

were available on 868 of 1018 children examined at the age of 3 years (85.3%); 865 (85.0%) of them had been to the well-baby clinic at the age of 6 months, 825 (81.0%) at the age of 1 year, and 810 (79.6%) at the age of 2 years.

The children were divided into two groups on the basis of their toothbrushing frequency: regular (daily) brushers and irregular (less often than once daily) brushers. In the analysis of the results the main attention was on the distribution of the chosen variables associated with the children's family environment and the mother's attitudes to dental well-baby clinics in terms of this classification.

Statistical analysis

Direct associations between the variables were assessed using the Pearson chi-square test. The associations between the main response variable, toothbrushing frequency, and the explanatory or risk factors were tested with logistic models (13). Differences at a 5% level of probability were considered statistically significant. Odds ratios (OR) were calculated for statistically significant associations. The confidence intervals (CI) selected for odds ratios were 95% intervals. The associations of various types of risk factors for poor toothbrushing habits were studied by using multivariate log-linear models. BMDP statistical software (14) was used for computer analysis of the data.

The study design was approved by the Ethics Committee of the Faculty of Medicine, University of Turku.

Results

The family environment and the child's toothbrushing habits

Of the young families, 12% lived with the child's grandparents. In 60% of these families, the child's teeth were brushed every day, whereas the corresponding rate for families living independently was 79% ($p = 0.001$). The mothers living with their parents were the youngest ($p < 0.0001$).

The mother's healthy manner of life was

associated with the child's good toothbrushing habits (Table 1). The frequency at which the mother brushed her own teeth was significantly associated with the child's toothbrushing ($p < 0.0001$). Dental floss was used every day by 7% of the mothers, sometimes by 44% of the mothers, and never by 49% of the mothers. The probability of poor toothbrushing was high in the children of mothers not using dental floss compared with the children of mothers using it every day. Eating of vegetable salads and interest in physical exercise before pregnancy distinguished between mothers in terms of the child's toothbrushing habits. Various types of hobby and the number of hobbies were not associated with toothbrushing frequency, unlike the mother's lack of a good friend, which was significantly associated with the child's low toothbrushing frequency (Table 1).

Poor toothbrushing habits were associated

with inability to take care of the child. A dummy (pacifier) was used by 23% of 3-year-olds. Nine per cent of the mothers always used a dummy to calm down a child with a tantrum. Bedtime rituals were observed with 56% of the children every evening. Toothbrushing frequency was significantly related to calming down the child with a tantrum by means of a dummy and to bedtime rituals (Table 1).

Interaction between risk factors

Factors associated with the child's low toothbrushing frequency, including the mother's age, regularity of exercise, regularity of visits to the dentist, evening rituals, and use of dummy during tantrums were assessed with log-linear models. No three or more of these factors when considered together had any significant effect. Significant associations of any two of the factors

Table 1. Mother's background factors in association with the child's poor toothbrushing behavior: Pearson's chi-square test (A) and mother's age adjusted (B). Response rates varied for various questions

	A			B		
	<i>p</i>	<i>n</i>	%	<i>p</i>	Odds ratio	95% confidence interval
Dental visits	0.03			NS		
Every year		527	20.9			
Every 1-2 years		184	19.6			
In pain		57	35.1			
Use of dental floss	0.006			0.03		
Daily		51	9.8			
Sometimes		330	18.8		2 versus 1, 2.0	—
Never		369	26.3		3 versus 1, 2.8	1.1-7.4
Vegetable salad in the diet	<0.0001			0.0002		
Often		426	16.0			
2-3 times weekly		303	24.1		2 versus 1, 1.6	1.1-2.4
Never		100	40.0		3 versus 1, 2.7	1.6-4.5
Physical exercise	0.002			0.03		
Regularly		376	17.9			
No exercise		446	26.9		2 versus 1, 1.5	1.1-2.1
Mother's own friend	0.03			0.04		
Yes		732	20.9			
No		88	30.7		2 versus 1, 2.0	1.03-2.82
Bedtime rituals	0.001			0.01		
Every evening		481	17.5			
Sometimes		206	25.7			
Never		173	29.5		3 versus 1, 1.5	1.1-2.1
Dummy (pacifier) use for tantrums	0.006			0.02		
No		690	20.9			
Yes		68	35.3		2 versus 1, 2.0	1.1-3.4

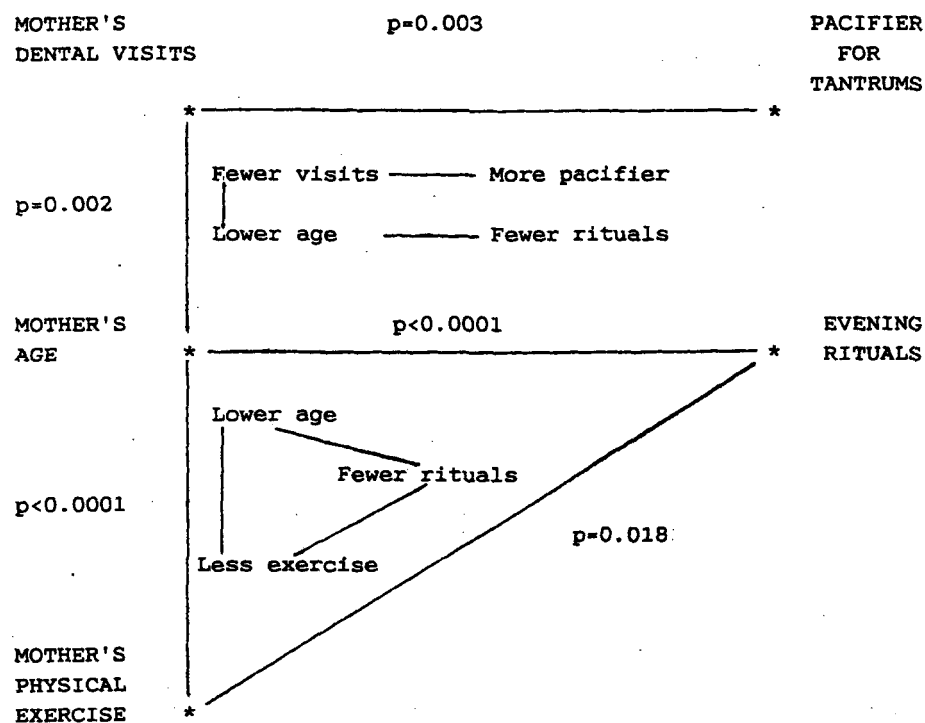


Fig. 1. Interaction between different types of risk factors associated with the child's low toothbrushing frequency.

were independent, unaffected by any third factor (Fig. 1). Thus, there was no interaction of risk factors.

Mother's attitudes towards the dental well-baby clinic

Dental health education at well-baby clinics was considered necessary by 98% of these primiparous mothers when the child was 1.5 years old. At that time, 75% considered that the number of times that they visited the clinic was suitable; five mothers (0.5%) were satisfied with fewer visits. Every fourth mother wanted to visit the clinic more frequently, and every third mother wished visits to the dental well-baby clinic to be kept separate from other visits to the well-baby clinic. With the exception of six mothers (0.6%), all mothers thought it important to care for the child's milk teeth at home, whereas 7.1% of the mothers did not attach

any importance to milk teeth care by a dentist.

When the child was 3 years old, 24% of the mothers regarded the instructions given at the well-baby clinic as useful, and 67% regarded them as useful although familiar, whereas 9% of the mothers thought that the instructions were familiar and therefore unnecessary. The amount of instruction was considered suitable by 86% of the mothers, while 12% of the mothers would have liked more instruction, and 2% less instruction.

The mother's age and health consciousness showed an association with her attitude towards the dental well-baby clinic. The youngest mothers had less knowledge about the clinic's activities (OR = 2.1; p = 0.0002; 95% CI, 1.4-3.2). The least knowledgeable had been least interested in physical exercise before pregnancy (p = 0.03), and they ate salads more seldom (p = 0.0003) than those familiar with the clinic's activities.

Those mothers who wanted to learn more about the dental well-baby clinic did not differ from other mothers in age, educational level, or occupational level, but they were interested in bodily exercise and used dental floss more often than those who were satisfied with the amount of health education that they had received.

Mothers' attitudes towards the dental well-baby clinic versus the child's toothbrushing

The mother's opinion about the clinic was not associated with the child's toothbrushing frequency. Of the mothers who wanted to have more education, a slightly higher proportion (83%) brushed the teeth of their children on a daily basis than the proportion who were satisfied with the amount of education they received (78%). Of the 16 mothers who wanted to have more education, only 9 (56%) brushed their children's teeth every day.

Toothbrushing was irregular among 30.6% of the children whose mothers did not want to take their children to the dentist, compared with 21.2% of children whose mothers considered such tooth care necessary.

Dental well-baby clinics and children's dental health habits

Health care education was provided for 64% of the parents by a dentist, for 16% by a dental nurse, and for the remaining 19% sometimes by a dentist and sometimes by a dental nurse.

The provider of dental health education had no association with the child's toothbrushing ($p = 0.02$) or the other dental health habits analyzed, including sugar use at the age of 1.5 years ($p = 0.8$), nighttime use of juice ($p = 0.4$), or consumption of sweets at the age of 3 years ($p = 0.7$). Those children whose parents had been provided with dental health education by a dentist alone used slightly more fluoride at the age of 3 years but not significantly more than the children of others who had also received dental health education from other sources or mixed sources ($p = 0.06$). The use of a dummy was also more common in this group,

although the difference was not significant ($p = 0.2$).

The mothers whose children's well-baby clinic data were not available did not differ in age ($p = 0.3$), basic education ($p = 0.3$), or occupation ($p = 0.7$) from those whose data were available.

Discussion

The study material is highly representative of the young families living in the area and having their first child. The proportion of children undergoing dental examination (83.5%) was similar to the national rates of children undergoing dental examinations at this age (82% in 1988) (15). Dental well-baby clinic data were not available for 15% of those who had undergone a dental examination. Almost all mothers visit both the well-baby clinic and the dental well-baby clinic. The unavailability of data was more or less technical. This explanation is confirmed by the dropout analysis, which did not show any significant differences in the backgrounds and children's caries incidences between those mothers who had undergone dental examinations and those who had not. The rate of participation in dental health counseling was higher in this study than in a study from Lappeenranta on children born in 1983 (16).

Finnish dental well-baby clinics have a good coverage, but if their performance is measured in terms of children's toothbrushing habits, the clinics have failed in their educational efforts in about 20% of families. An earlier study showed that the mother's young age and rural place of residence are significantly associated with poor dental health care habits in children (11). The migratory movements of the last 2 or 3 decades from the rural to urban areas have reduced the importance of tradition and increased the helplessness of parents. On the other hand, many of the youngest mothers lived with their parents in the countryside, adopting traditional dental health habits. In a rural culture toothbrushing is not appreciated as much as in urban conditions (17-19). The disruption of this rural tradition is still

an important challenge for health education.

This study showed that the young mothers were less willing to share time and energy with the child and not keen on caring for themselves. Young mothers seldom visited dental well-baby clinics, and they were not interested in physical exercise. A study on Finnish women aged 20, 30 and 40 years supports this assumption (20). A clear correlation occurred between the type of motherhood of 20-year-old women and their poor level of subjective health. It would seem that the youngest mothers nowadays find it difficult to cope with motherhood in a mature manner. The children of young mothers had a lower frequency of evening rituals. A young person may find it difficult to understand a child's needs, which can be met with one-directional responses, those from the parent. According to Wolman, 'to be an adequate parent one needs to be strong, friendly, willing to give, help and take care of the child without asking anything in return' (21).

About 80% of Finnish mothers work (22), and the children share their time between day care center and home. This places not only the children but also the parents in a network of influences acting on the child's growth and development. Although a great deal of general information on dental health care is available from other sources, dental health education providers at well-baby clinics are still valued as disseminators of information as much as earlier, as the present study shows. Specialist advice is increasingly important for the upbringing of children, and books by experts in the field sell very well (22). However, excessive reliance on experts diminishes self-confidence: independent decisions are difficult to make. Mothers' attitudes towards the dental well-baby clinic reflect a similar situation. Very few mothers were critical of the clinic's performance; most mothers thought that it was good both qualitatively and quantitatively. Every child needs basic, individualized counseling about the age to start toothbrushing, the use fluoride, and about suitable nutrition. The dental health care habits seen in the present study were unaffected by whether the advice was given by a dentist or a dental nurse.

Those mothers who wanted additional advice cared well for their own and their children's health. Their self-confidence should be increased, and the role they have in the upbringing of their children should be recognized.

The results of the present study lead to the following conclusions:

New methods are needed to make rural populations appreciate oral health better.

Young mothers need support in the care of their own and their children's teeth.

Each family expecting their first child needs a basic amount of counseling. Health-conscious parents should be supported in their habits.

The provider of basic counseling is not important for the practical application of health knowledge.

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