Oral health behavior, knowledge, and attitudes of children, mothers, and schoolteachers in Romania in 1993

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In Romania an increasing level of dental caries in children has been observed. The present study was undertaken to describe the oral health behavior of schoolchildren in the first grade, to assess the level of oral health knowledge and attitudes among the mothers, and to describe oral knowledge and attitudes to prevention among the schoolteachers. A total of 322 mothers of grade-1 children (response, 89%) and 97 schoolteachers (response, 86%) participated in the study. Data on mothers and children were collected through personal interviews, whereas the teachers responded to self-administered questionnaires. A significant proportion of the mothers knew about the causal factors in dental caries; however, relatively few were aware of the harmful effect of hidden sugar. Most of the mothers were aware of the importance of toothbrushing, but 33% also recommended the use of salt for prevention of periodontal disease. Of the children, 37% brushed their teeth at least twice a day; 26% had their teeth cleaned by their mothers every day. Sugar was mostly consumed in terms of milk with sugar, sugary breakfast cereals, biscuits, and sweets. The schoolteachers knew about the poor dental conditions in children and wanted to become involved in oral health education. Training of teachers should aim at improving their level of knowledge on oral health. The establishment of school-based oral health promotion programs in Romania is urgently needed. □ *Dental caries; diet, cariogenic; oral hygiene; toothbrushing*

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During recent years evidence has accumulated in several Western industrialized countries of encouraging trends in the prevalence and severity of oral disease. In children this has been shown by a reduction of dental caries and an improvement of gingival conditions (1–5). The reasons for this development are complex but may involve a more sensible approach to sugar consumption, improved oral hygiene practices, fluorides in toothpaste, topical fluoride application, and fluoride rinsing. In several countries school-based preventive care and oral health education programs have been established. The reduction of oral diseases in the child population of most Western countries coincides with an increase in the prevalence of those diseases in Eastern and Central Europe (3, 5). The oral health care standards in these countries are relatively low, and community-based preventive oral care and oral health promotion have not been implemented systematically.

In Romania a recent nationwide survey showed a high level of dental caries in schoolchildren (6). For example, the mean caries experience was 11.4 defs in 7-year-olds and 6.5 DMFS at the age of 12. In both groups untreated caries constituted most of the caries index. As a result of interuniversity collaborative projects between Romania and Scandinavia, initiatives have now been taken towards implementation of school-based oral health promotion programs. The present study had three aims: first, to describe the reported oral health behavior of grade-1 Romanian schoolchildren; second, to assess the level of oral health knowledge and attitudes among the mothers before the children were enrolled in the program; and third, to record the knowledge and attitudes towards prevention of oral disease and oral health education among the schoolteachers. The results of the study were to be used to aid the planning of an oral health education program.

Study population and methods

The study took place in 1993 and included children in the first grade (7 years) in two urban areas: the capital, Bucharest, and Iasi, located in the northern province of the country. These sites were chosen as focal points for establishment of demonstration projects. At each site, three representative primary schools were selected for the data collection. The study population comprised 322 mothers and children, 89% of the original sample. Data were collected by means of personal interviews performed by two trained dentists on the basis of a structured questionnaire. All interviews were undertaken in the schools, and the mothers were not informed about the professional background of the interviewer. The questions concerned oral health knowledge, atti-

Table 1. The percentages of mothers and schoolteachers who indicated that 'the following items can harm your natural teeth'

	Mothers ($n = 322$)	Schoolteachers ($n = 97$)
Sugar	67	65
Milk with sugar	29	25
Coffee with sugar	24	22
Tea with sugar	21	21
Sweets/candy	94	88
Soft drinks	21	23
Smoking	76	72

Table 2. The mothers and schoolteachers distributed (%) on the basis of sources of dental health information (more than one response allowed)

	Mothers ($n = 322$)	Schoolteachers ($n = 97$)
Dentist	67	78
Physician	6	6
Schoolteachers	19	11
Books	55	61
Television	41	39
Radio	26	25
Newspapers	25	22
Magazines	31	35
Relatives/friends	12	12
Mother/father	41	45

tudes, sources of oral health information, oral health behavior of the child and mother, parental support in oral health, evaluation of the dental health of their child, number of children in the family, and educational level of the parents. Oral health knowledge and attitudes were measured by using open-ended questions and positive or negative responses to loaded statements. The validity and the reliability of the items have been tested in a previous methodologic study (7, 8). Moreover, the study included 97 schoolteachers of first-grade children in the school districts involved. All teachers of first-grade children were identified, and the response rate was 86%. The data on teachers were collected by self-administered questionnaires that included questions on oral health knowledge and attitudes and involvement in health education in classrooms. Identical structured and semi-structured questions on knowledge and attitudes were given to teachers and mothers.

The data analyses were performed by means of the Statistical Analysis System at UNI.C, Lundtofte, Denmark, and frequency distributions were used. The chi-square test was used in the statistical evaluation of the frequency distributions.

Table 3. The percentages of mothers and schoolteachers who responded positively to statements on the prevention of dental diseases in children

	Mothers ($n = 322$)	Schoolteachers ($n = 97$)
Children's teeth should be checked regularly by a dentist	86	93
Children less than 10 years old need help from adults in toothbrushing	56	68
Toothbrushing prevents tooth decay	89	89
Toothbrushing prevents bleeding from gums	64	54
Improper consumption of sugar causes teeth to decay	80	75
Parents should restrict children's consumption of sweets and sweetened drinks	75	73
Fluoride protects the teeth against decay	79	72

Results

Knowledge and attitudes of mothers

The responses with regard to boys and girls were combined, since no substantial differences in knowledge, attitudes, or behavior were found. A significant proportion of the mothers (39%) answered that dental caries is caused by sugar; the role of bacteria was mentioned by 33%, and the importance of bacteria plus sugar by 56%. The negative effect of sugar consumption was primarily considered in relation to sweets, since relatively few of the mothers were aware of the effect of sugary drinks (soft drinks; milk, tea, or coffee with sugar) (Table 1). As to the causes of bleeding gums, incorrect tooth cleaning was reported by 79%, general illness by 26%, unhealthy diet by 21%, mixing hot and cold foods by 22%, and hereditary factors by 13%. With regard to prevention, 87% of the mothers answered that dental caries may be prevented by toothbrushing; regular dental visits were recommended by 76%, use of fluoride by 46%, and avoiding sugar by 26%. Sixty-five per cent indicated that regular dental visits may prevent gingival bleeding; 46% stressed proper toothbrushing, 33% the use of salt, and 24% the use of fluoride. Moreover, one-tenth reported rinsing of mouth with water, and another tenth the use of drugs. Table 2 shows the sources of dental health information. About half of the mothers held the attitude that children in first grade need help from adults in toothbrushing, and three of four mothers stressed that parents should restrict children's consumption of sweets (Table 3).

Dental conditions and habits

Table 4 illustrates the level of self-reported dental

Table 4. The percentages of children and mothers with specific dental conditions and dental care habits as reported by mothers

	Children ($n = 322$)	Mothers ($n = 322$)
Dental conditions		
Poor/very bad teeth	18	29
Perceived need for dental treatment	37	60
Dental care habits		
Toothbrushing		
At least twice a day	37	52
Once a day	33	26
Less often/never	30	22
Dental visits within the last 12 months	41	44
Never been to a dentist	31	13

conditions and dental care habits in children and mothers. Of the children, 53% brushed before breakfast, 18% after breakfast, and 50% before bedtime. Fluoridated toothpaste was used by 16%. Most of the mothers (96%) would like their children's teeth to be better. As shown in Table 5, relatively few of the mothers helped their children in daily toothbrushing; however, regular dental care habits were significantly more frequent in children whose mothers visited the dentist themselves (Table 6) and in families with higher level of education (Table 7). Healthy foods were often consumed by the children (Table 8). Table 9 indicates that sugar was mostly consumed in terms of milk with sugar, sugary breakfast cereals, biscuits, and sweets.

Knowledge and attitudes in schoolteachers

In the semi-structured questionnaires 40% of the teachers answered that bacteria cause teeth to decay, 26% mentioned sugar, and 40% indicated bacteria plus sugar. A substantial proportion of the teachers were also aware of the harmful effect of sweets (Table 1). With regard to the question on what causes bleeding gums, 63% stressed that this was due to incorrect toothbrushing, 28% that it was unhealthy diet, and 14% suggested general illness. One-fifth answered that bleeding gums were caused by mixing hot and cold foods. Seventy-eight per cent of the teachers stressed the importance of toothbrushing in prevention of dental caries, whereas this answer was given less frequently with regard to bleeding gums (34%). A total of 41% were aware of the positive effect of fluoride, and reduction of sugar intake was mentioned by 24%. Finally, 57% suggested the use of salt for the prevention of bleeding gums, and 55% stressed the role of regular dental visits. The sources of dental health information for teachers are given in Table 2.

One fifth of the teachers answered that the children's teeth were poor or very bad, and 77% indicated that children in the first grade are in need of dental treatment. Nearly all teachers held the opinion that children's teeth should be checked regularly by a dentist (Table 3). Furthermore, 81% responded positively to the statement that schoolteachers should teach children about causes of dental diseases, 79% were positive towards teaching children how to take care of their teeth, and 77% agreed to teach children about diet and sugar. A total of 10% of the teachers answered that their children had been taught about teeth in the classroom during the past year, with a mean number of 2.4 lectures.

Discussion

In Romania no data are available on the oral health behavior of children, and the present study provides such information with regard to primary school children. Moreover, the objective of this study was to describe the oral health behavior situation among mothers and teachers before the children were enrolled in an oral health education program, and the intention is to evaluate the situation when the children leave primary school. The interview method was chosen for the study of mothers, since many of them were not familiar with questionnaire surveys. For practical and economical reasons the data on the schoolteachers were collected by means of self-administered questionnaires. Acceptable response rates were obtained for both data sets. To check reliability, highly structured questionnaires were constructed, and the wording of the questions was identical, to enable comparisons of responses given by mothers and schoolteachers. The data collection methods may have certain limitations (9). With regard to dental knowledge, oral hygiene habits, frequency of dental visits, and consumption of healthy foods, overreporting has to be assumed, whereas the consumption of sugar, sweets, and sugary drinks has probably been underreported.

Table 5. Mothers distributed (%) on the basis of how often they help their child in toothbrushing ($n = 322$)

	Every day	Weekly	Sometimes	Seldom/never
I clean his/her teeth	26	3	15	56
I check the teeth after cleaning	32	5	27	36
I talk about cleaning	22	12	31	35

Table 6. The percentages of children who showed positive oral health behavior and mothers with positive dental attitudes in relation to the dental visit habits of the mothers

	Mother had seen a dentist within 12 months		Total
	Yes ($n = 142$)	No ($n = 180$)	($n = 322$)
Child had a dental visit within the last 12 months	69***	22	41
Child brushes teeth at least twice a day	43**	33	37
Mother brushes the child's teeth every day	25	26	26
Children less than 10 years old need help from adults in toothbrushing	65**	49	56

**$P < 0.01$; ***$P < 0.001$.

Table 7. The percentages of children who showed positive oral health behavior and attitudes towards prevention in relation to level of education of the family

	Education			Total
	Low ($n = 180$)	Moderate ($n = 69$)	High ($n = 73$)	($n = 322$)
Child had a dental visit within the last 12 months	31	42	61***	41
Child brushes teeth				
At least twice a day	32	39	40	37
Once a day	28	38	43	33
Mother brushes the child's teeth every day	28	20	25	26
Children less than 10 years old need help from adults in toothbrushing	52	64	62	56

***$P < 0.001$.

Table 8. The children distributed (%) by consumption of healthy foods as reported by mothers ($n = 322$)

	Twice a day or more often	Once a day	Several times a week	Sometimes	Seldom/never
Bread	77	3	3	1	15
Raw vegetables	12	11	31	24	22
Fresh fruits	30	14	35	8	15
Cheese	10	13	40	19	19
Eggs	6	22	50	9	13
Milk without sugar	10	12	22	17	39

Poor oral care habits and self-reported bad teeth were found for a substantial number of the children. In light of the high prevalence of dental caries observed in children in the first grade (6), the mothers seemed to have a rather realistic evaluation of their children's dental health status. Despite this, relatively few helped their children in oral cleaning. Therefore, health education should focus on parental responsibility for oral health, and the mothers should be encouraged to give practical and emotional support to their children with regard to oral hygiene habits.

The need for oral health education of Romanian mothers and children was confirmed by the present results. First of all, the survey showed a clear discrepancy between dental knowledge and practice. On the one hand, most of the mothers knew about the negative effect of sweets and candy; nevertheless, the consumption of various sugary foods was relatively frequent. For example, the consumption of milk with sugar, sugary breakfast cereals, biscuits, and sweets was common. As to future oral health education programs, information given to parents should aim at improving knowledge about the negative effect of sugary drinks and the interplay of bacteria and sugar in the development of dental caries. In general, more accurate information on preventive measures is needed. Most of the mothers were aware of the importance of proper toothbrushing in the prevention of dental caries. However, as to prevention of periodontal disease, the role of proper oral hygiene was less frequently stated by the mothers, and

Table 9. The children distributed (%) by frequency of consumption of sugary drinks/foods as reported by mothers ($n = 322$)

	Twice a day or more often	Once a day	Several times a week	Sometimes	Seldom/never
Milk with sugar	12	21	15	20	32
Soft drinks	6	9	18	28	38
Fruit drinks	9	8	19	35	29
Sugary breakfast cereals	7	30	9	18	37
Cakes/pastry	4	6	29	36	25
Biscuits	11	12	33	24	21
Jam	10	12	21	32	24
Chewing gum with sugar	8	7	29	24	34
Sweets/chocolate bars and so forth	12	13	42	27	6

gingival bleeding was often explained within the context of traditional beliefs, such as the mixing of hot and cold foods and prevention by the use of salt.

For young children, parents or family represents the primary source of information about oral health. One way to raise children's oral health awareness would be to give accurate information to parents. However, the primary schools have great potential for influencing the health behavior of the children (10). They spend considerable time in school and can be reached at an age when their habits are being formed. Health education programs in the schools may be conducted internally by health personnel, or by the teachers (11). The advantages of using school personnel are the potentials for reaching all the children, for continuity in the instructions, and for integration of health and oral health with other activities and the low cost of the activity. A possible disadvantage could, however, be that the teachers may not have an adequate background for providing health education. In the present survey, no significant differences in the level of oral health knowledge were found between schoolteachers and mothers, even though the teachers tended to have been informed more often by dentists. Both the mothers and the schoolteachers showed positive attitudes towards prevention, and the study indicates that various sources would seem available and effective for oral health information. The teachers responded positively to becoming involved in the oral health education of the children, and they can undoubtedly become key persons in this activity. However, they need proper training and practical support from dentists experienced in public health, and the teachers should also be provided with educational materials.

Previous studies have shown that parents' education and dental attendance patterns exert a powerful influence on the dental health of their children (8, 12, 13). According to the present survey, a substantial proportion of children and mothers did not visit a dentist regularly. The dental visits of the children were less frequent in less-educated families and among parents who did not participate in regular dental care themselves. Until recently, the child population in Romania was covered by a school dental service program, but owing to shortages of dental materials and equipment most of the school dental offices have been closed. However, initiatives are being undertaken to revitalize the system, introducing oral disease prevention and oral health education. Such oral health care programs, incorporating Scandinavian experiences within community health work, are now implemented in several pilot schools, and follow-up studies will be conducted to measure the oral health outcomes.

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