Evaluation of information on dental health care at child health centers

Differences in educational level, attitudes, and knowledge among parents of preschool children with different caries experience

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The aim of this study was to interpret the manner in which information on dental health care, systematically offered at child health centers, is assimilated among parents of preschool children with different caries experience. The material comprised children who, on the basis of defined criteria were classified as 'healthy' or 'diseased' with regard to caries and restorations. The investigation was mainly performed as telephone interviews with the parents. The results showed no difference between the groups with regard to diet, oral hygiene, and use of fluorides. However, parents of healthy children had a statistically significantly higher level of education than parents of diseased children. The level of education did not influence the knowledge as such but rather the ability to put the knowledge into practice. Parents of healthy children claimed to a greater extent than parents of diseased children to have received a combination of verbal and written information. This could be because the first group had a greater interest in assimilating new information and in creating a two-way communication with the informer. This is probably an effect of the level of education and confirms that it is essential to make people aware of the information's importance rather than merely teaching facts. □ *Behavioral science; telephone interview*

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Dental caries is a common disease. During the past 20–25 years, however, its prevalence has decreased considerably in the Western world, especially among children and adolescents (1–3). Many authors are of the opinion that the decrease is linked to a concomitant increase in the use of fluoride toothpaste (1, 4–7). In Sweden the prevailing view is that other factors have also contributed, such as extended dental health care, including caries-preventive information. Information on dental health care at child health centers (CHC) is considered to have been a major factor behind the decrease in caries at early ages, which has been shown in a few investigations in 4-year-olds (8–10).

The data referred to are from the 1960s. Parents of the 1980s can be assumed to have a better knowledge about dental health care, after their own participation in school preventive programs, than parents some years ago. Consequently, little is known about the value of information on dental care at CHC today. What is known, however, is that some children still have an appreciable amount of dental decay, pointing to the need to make the information at CHC still more effective. Since earlier studies on dental health information only to a limited extent have elucidated how the information is perceived, it was considered of interest to perform an explorative study.

The aim of the present study was thus, by applying a behavioral sciences approach, to interpret how information on dental health care, systematically offered at CHC, is

assimilated among parents of preschool children with different caries experience.

Materials and methods

The study was performed in 1983 in the primary care district of Helsingborg, a city in Malmöhus County.

Dental health care at child health centers

In Sweden, a general health supervision and handicap tracing is carried out in preschool children at CHC, and information is at the same time given to the parents. The aim of the information is to arouse interest, increase the level of knowledge, and generate persistent changes in attitudes and behavior with regard to health care. Dentists, dental hygienists, or dental assistants give the information on dental health care. In Malmöhus County the proportion between the three groups of personnel was 50% dentists, 10% dental hygienists, and 40% dental assistants at the time of this investigation.

The tasks of the dental staff are to give advice on eating habits, oral hygiene, and fluorides, to give instructions in oral hygiene, and to identify cases at risk of caries for referral to dental clinics (11). This program was at the time of the study offered to the parents at their visits to CHC when the children were 6, 18, and, sometimes, 30 months of age.

Subjects

Five-year-olds were selected for the study. The parents of these children could be expected to remember the information on dental health care given at CHC. The children were examined for caries at the age of 4 years and had been exposed to caries-provoking factors long enough to develop dental decay.

Two groups were selected, here called 'healthy' and 'diseased', respectively. According to their dental records the first group had no cavities or restorations at the age of 4 years. The children in this group were therefore considered caries-free. The children in the second group had a defined number of restorations—that is, ≥ 3 treated approximal surfaces and/or occlusal surfaces in primary second molars. This group was chosen to obtain a clear demarcation from the caries-free children. Any data from examinations after the 4-year check-up were disregarded. The number of healthy children on record was 471, and the number of diseased was 130. From these groups, 101 healthy and 105 diseased children were randomly sampled.

To obtain some background variables that were not evident from the dental records, such as whether information had been received at CHC or not, the CHC medical record of every individual was checked at the respective CHC.

Telephone interviews

The main part of the study was performed through telephone interviews with the parents by one of us (C. Granath Kinnby). In all cases but one the interviewee was the same parent who had received the information at CHC. A few days before the interview all parents received an introductory letter describing the study. For the interviews a questionnaire with mainly preconstructed answer alternatives was made. It included questions about demographic data, dietary and hygiene habits, fluoride supply, and views on the information on dental health care received at CHC. The full questionnaire with answers is available on request. To the defined reply alternatives was added a null alternative, which is used when an interviewee gives an answer that is impossible to code or refuses to answer. Several so-called open-answer alternatives also existed, partly as 'fillers' and partly to provide a possibility for later suitable grouping. Fillers represent alternatives with the purpose of creating an interview atmosphere in which the interviewee will not feel distressed or interrogated.

All families that had an unlisted telephone number received a special introductory letter in which they were asked to get in touch. In the healthy group there were 7 with an

Table 1. Percentage distribution of level of education of 140 parents of healthy (no cavities or restorations) and diseased (≥ 3 treated approximal surfaces in primary second molars) 4-year-old children in Helsingborg, Sweden, in 1983; number of subjects in parentheses

Educational level*	Father's education supplemented with the mother's in 19 cases (9 healthy and 10 diseased)		Mother's education supplemented with the father's in 21 cases (9 healthy and 12 diseased)	
	Healthy (75)	Diseased (65)	Healthy (75)	Diseased (65)
I	33.3	20.0	16.0	13.8
II	32.0	13.8	37.3	20.0
III	34.7	66.2	46.7	66.2

Chi-square = 14.15, $p = 0.0008$; d.f. = 2; chi-square = 6.04, $p = 0.0491$.
* I = university/college; II = senior high school; and III = grade school education.

unlisted number and in the diseased group 10, together about 8% of the total material. According to the telephone company, the average figure for Sweden is about 12%.

Dropout

The dropout rate among the healthy was 15 children and among the diseased 14, altogether about 14%. The commonest reasons were unlisted telephone number and no availability. Since the dropout rate was the same in both groups and since background factors coupled to the caries situation could be suspected in only two cases, it was not considered important for the results of the study. Thus the final number of healthy individuals was 86 and that of diseased 91.

Level of education

The classification of the level of the parents' education was based on the information on occupation in the CHC medical records. The occupations were grouped in accordance with the assumed education obtained from a list of sociologic criteria (12): grade school (III), senior high school (II), and university/college (I). Both parents' occupations were noted if recorded. Two analyses were made, one about the education of the father, supplemented with that of the mother when the father's education was unknown, and another about the education of the mother, supplemented with that of the father in the corresponding manner (Table 1).

Native language

If Swedish was not spoken at home, the foreign language was noted. Since these language groups were small, they were combined into one group comprising 23 subjects.

Statistical analysis

Three main analyses were made—that is, all answers and background variables were cross-tabulated with 1) healthy versus diseased children, 2) parents' levels of education, and 3) Swedish versus foreign native language. Since the number of individuals in some subgroups was low, combinations were made on the basis of logic. Open-answer alternatives were grouped in suitable categories.

Chi-square tests were performed for all questions with preconstructed answer alternatives and for questions with open alternatives, where the answer possibilities were limited automatically. For one answer, in which all individuals were not included by the prevailing alternatives, a test of percentage figures was made for the different subgroups. Differences at the 5% level of probability were considered statistically significant.

For the computations, a Univac 1100 and a standard program (SPSS: Statistical Package for the Social Sciences) were used.

Results

All children

All children had visited CHC, but 9% of the parents declared that they had never received any information on dental health care on these occasions. According to the records, 8 of these 16 parents had been informed. Thirty-five per cent said they had been informed about one of the factors diet, oral hygiene, or fluoride, 50% about two of these factors, and 15% about all three.

Sixty-three per cent said they had received the information from a dentist, 13% from a dental hygienist, 7% from a dental assistant, and 1% from two categories, whereas 16% did not know. These figures deviated markedly from the corresponding data in CHC records. The information had been grasped by 99% of the parents. However, 86% did not learn anything new, whereas 12% claimed they had. Thirty-nine per cent said they were taught about foods that are healthy for children's teeth, but 57% had not received such information. Corresponding figures for how to brush a child's teeth were 72% and 22%, and for advice on the use of fluorides 85% and 14%. Thirty-three per cent wished they had received more frequent and also better information, especially about diet and fluoride.

Differences between healthy and diseased children

The results show that the level of education was statistically significantly higher among parents of healthy children than among those of diseased children (Table 1), but the healthy children did not display better dental habits than the diseased (Table 2).

There were significantly more families with Swedish as native language in the healthy group (95.3%) than in the diseased group (79.1%) (chi-square = 8.91, $p = 0.0028$). The professions of 16 parents of children with a foreign native language was known. These parents had a significantly lower level of education than parents of children with Swedish as native language, on the basis of the father's education supplemented with the mother's in four cases (one healthy and three diseased) (chi-square = 10.56, $p = 0.0051$).

More parents of healthy children had received both oral and written information at their visits at CHC than parents of diseased children (Table 3). With regard to type of day care, a higher frequency of diseased than healthy children had attended day nursery on a half- or full-day basis, whereas the healthy children had used private day care to a greater extent (Table 4).

Parents of healthy children had received dietary advice favoring a mixed diet, whereas

Table 2. Chi-square tests of differences in dietary, oral hygiene, and fluoride habits between healthy and diseased children; for details, see Table 1

Habit	*P* value
No. of regular meals per day	0.5534
No. of regular snacks per day	0.4023
Suitable versus unsuitable snacks	0.2710
Frequency of consumption of sweets	0.2653
No. of toothbrushings per day	0.9547
Who brushes the child's teeth	0.4844
Use of toothpaste	0.0429*
Fluoride in toothpaste	0.8066
Intake of fluoride tablets	0.3605

* See Table 6.

Table 3. Percentage distribution of how the advice was given; for details, see Table 1

	Healthy (79)	Diseased (83)
Oral	13.9	39.8
Oral + written	82.3	59.0
Did not know	3.8	1.2

Chi-square = 14.16; d.f. = 2; $p = 0.0008$.

Table 4. Percentage distribution of type of day care; for details, see Table 1

Day care type*	Healthy (86)	Diseased (91)
A	50.0	52.7
B	29.1	41.8
C	20.9	5.5

Chi-square = 10.16; d.f. = 2; $p = 0.0073$.

* A = at home; B = at day nursery during half or full day; and C = at the homes of women providing day care for the children of others during half or full day.

the information to parents of diseased children was dominated by single-product groups (Table 5). More children in the diseased group used toothpaste regularly (Table 6). Seventy-five per cent of the children used a fluoride toothpaste. Thirty per cent of the parents gave their children fluoride tablets. There were no differences between the groups with regard to the use of fluorides (Table 2).

Of the parents of the diseased children, 6.6% claimed they did not know how cavities in teeth occur, whereas the figure for parents of healthy children was 1.2%, a difference that is statistically significant ($z = 1.89$, $p = 0.0294$). Otherwise, parents of healthy children believed more in unsuitable diet and the importance of inheritance as factors in the origin of caries.

In the healthy group toothbrushing was considered more important than in the diseased group. Parents with a foreign native language ranked the importance of toothbrushing in children much lower than parents with Swedish as the native language (chi-square = 27.14, $p < 0.0001$). Similarly, parents with a foreign native language ranked the importance of dietary habits much lower (chi-square = 16.03, $p = 0.0011$).

Discussion

The results show that the level of education was statistically significantly higher among parents of healthy children than among those of diseased children, which has been manifested previously (8). It should, however, be underlined that the relation between parental education and the dental health of the children was weaker when the analysis was based on the educational level of the mother than that of the father. Irrespective of who has the intellectual influence, in most cases the mother seems to be the main guardian as a result of her usually greater practical experience and consciousness of health care (13).

The parents in both groups reported similar habits concerning diet, oral hygiene, and use of fluorides, which is remarkable and should be debated. A link in the chain of *achieved knowledge → changed attitudes → changed behavior* might have been disrupted. Certain basic knowledge and, possibly, appropriate attitudes could be in common, but it is possible that parents of the diseased children had not been able to implement these steps in the chain to behavior. On the other hand, parents of healthy children had better knowledge of the origin and also the prevention of caries.

Immigrants' preschool children have more dental disease than Swedish children (14–17). Accordingly, in our study significantly more families with Swedish as native language were found in the healthy group than in the diseased group. As many as 83% of all families with a language other than Swedish were found in the diseased group, which can have several explanations. When immigrants who do not speak Swedish visit CHC, they have the right to the services of an interpreter (18). Only one family had received interpreter assistance, and others seemed to be unaware of their right. Furthermore, some CHC send summons only in Swedish,

Table 5. Percentage distribution of type of dietary advice to those parents who had received information about what is suitable for children's teeth; for details, see Table 1

Dietary advice*	Healthy (32)	Diseased (31)
A	34.4	6.5
B	34.5	61.3
C	28.1	25.8
D	3.1	6.5

Chi-square = 9.07; d.f. = 3; $p = 0.0309$.
* A = balanced diet; B = single-product groups; C = food requiring chewing; and D = did not know.

Table 6. Percentage distribution of use of toothpaste; for details, see Table 1

Toothpaste use	Healthy (85)	Diseased (91)
Regularly	87.1	95.6
Sometimes	9.4	1.1
Never	3.5	3.3

Chi-square = 6.30; d.f. = 2; $p = 0.0429$.

and others send translated versions. Many of the immigrant families had not understood the introductory letter. This suggests the importance of providing written material in appropriate languages.

Parents of healthy children had to a greater extent received both written and verbal information (82%) than parents of diseased children (59%). This might be the result of the common observation that parents of healthy children show greater interest and therefore receive and read more printed material. This indicates that the information has to be adjusted to the educational level of the recipient. It is not unlikely that this is the core of the problem. However, 58% of the immigrants claimed they had received both printed and verbal information, which is remarkable, since the supply of printed material in languages other than Swedish was limited.

A noteworthy finding was that parents of diseased children to a lesser extent than parents of healthy children declared they had been informed about mixed eating habits. This can simply be because a real dialogue or two-way communication had been established in the second but not in the first group, probably related to the higher educational level and a greater intellectual capacity.

There was a difference between those healthy and diseased children who were not at home all day. Diseased children were to a greater extent at a day nursery, and healthy children in private day care. In addition, 70% of the healthy children were away from home all day, whereas the corresponding figure for the diseased was 49%. These circumstances are difficult to evaluate as long as the food at the respective places has not been analyzed, but some mothers of children at day nurseries reported unsuitable components of between-meal snacks.

The results of the present study warrant several remarks. At a situation like the one at CHC, mostly with only one recipient at a time, it is important to individualize the information by interpersonal communication. Furthermore, it is important to stimulate an interest in suitable printed matter. Whereas solely written material is more or less worthless, oral information combined with printed material is considered good provided the latter is correctly designed from a learning point of view. The printed material is an aid to the recipient in memorizing the informer's message, and repeated information gives the best result (19).

There is a tendency for the recipient to simplify the information. Single details are remembered at the expense of the whole. As an example, parents of the diseased children in our survey remembered information about a separate group of products instead of a balanced diet. Parents of the healthy children seemed to assimilate the information more actively.

The less informed one is, the more difficult it is to assimilate further information. This means that with an increasing flow of information in society, the so-called information gap between individuals with different levels of education becomes wider (20). In addition, people tend to screen themselves from information that does not agree with their opinion or behavior, according to Festinger's theory of dissonance (21). This means that to generate positive changes in the behavior of an individual, much is required from the informer with regard to engagement, comprehensiveness, and also empathy. With a generally positive attitude, one should try to find out what factors lie behind a certain negative behavior of the recipient.

In the dental health care sector, as in most other areas of our society, much information is given today to improve the situation of the individual. If this information is to reach the target groups, it needs to be properly adapted. The target group at CHC is not uniform. Consequently, the informer has to have an idea about the level of education and knowledge of the recipient, which can be obtained through asking questions or encouraging him/her to pose questions and thus start a dialogue, which may reveal insufficient knowledge and unsuitable attitudes and behavior. It is illustrative that about 86% of the parents said they had not learned anything new. This could be the result of insufficient interest to profit from new information, the level of information being too low, or a kind of rationalization. Anyhow,

the statement should be considered important, since 99% reported they had understood the information.

Science-based health education is only one part of health promotion (22). To stimulate the recipients of information to participate in preventive programs and to undertake measures that appeal to their feelings and personal conceptions are integral parts of the process (13), according to contemporary pedagogics in prevention (23).

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