Dental health knowledge and attitudes in a disadvantaged, rural population

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Dental health knowledge and attitudes were studied through interviews with recipients of social insurance and/or welfare assistance aged 20—60 living in a rural community in Norway.
Most respondents were poorly informed about dental diseases, particularly periodontal disease. Much ignorance surrounded waterfluoridation, whereas local application of fluorides was known and approved by 66% of the respondents. School dental treatment was almost unanimously considered beneficial. Only 56% of the interviewed, however, meant that filling of deciduous teeth was worthwhile. Sixty-nine per cent of the group considered conservative treatment preferable to prosthetic. General public financing of dental care was recommended by 56 % of the respondents, while 30 % held that public support should be reserved for the needy. Analyses of the data indicated that dental health knowledge and attitudes had been affected by situational factors and treatment experiences.

Key-words: Public health dentistry; rural population; socioeconomic factors

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Data concerning the knowledge of and attitudes toward dental health are scarce in Scandinavia. It seems to be of special importance to gain information on the relationship between social background, attitudinal factors and dental health behaviour. In a previous publication the utilization of dental services among disadvantaged individuals living in a rural community in Norway, was reported (*Helöe*, 1973). The purpose of the present investigation was to study basic dental health knowledge and attitudes within this particular group. Furthermore, it was intended to analyze the possible effect of social variables and treatment experiences on the level of knowledge and the attitudes.

MATERIAL AND METHODS

The participants in the previous study were available (*Helöe*, 1973). Three persons, however, had to be excluded from the present study because of mental illness. Thus, the group comprised 213 recipients of social insurance and/or welfare assistance (77 men and 136 women) aged 20—60. All persons were interviewed by the author by means of a pretested questionnaire. The questions dealt with: (1) dental diseases, (2) dental care, (3) the

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payment of dental care, (4) dental care for children, and (5) the use of fluorides. The exact wording of the 15 questions are given in the Results. Questions 1, 4—8, and 13 were open-ended, while precoded alternatives were used for the recording of the answers to questions 2, 3, 9—12, 14, and 15.

Treatment of the data. Sex, age, income, number of teeth, school dental treatment, and recent treatment pattern were used as independent variables for the consideration of data obtained by 10 of the questions. Each independent variable was related to selected values (Tables I—III).

Three questions estimating the level of knowledge (Questions 2, 9, and 13) were used to construct an additive index of knowledge (*Galtung*, 1969). Similarly, an attitude index was based upon 4 questions, estimating attitudes toward preventive and conservative dentistry (Questions 5, 6, 14, and 15). In order to get further insight into the relationship between level of knowledge, attitudes and the independent variables, the information from each of the indices were considered by means of stepwise regression analyses. The data from the knowledge index was dichotomized (1, »high»; 0, »low») leaving 111 and 102 persons in each group, respectively. The data from the attitude index was divided into 69 »positives» (1), and 144 »negatives» (0). The independent variables used as regressors were dichotomized as follows:

Sex: 1, women; 0, men.

Age: 1, 20—49 years of age; 0, 50—60 years of age.

Income: 1, 20.000 kr. +; 0,0—19.000 kr.

Number of teeth: 1,5 teeth +; 0, under 5.

School dental treatment:

1, regularly or occasionally treated; 0, irregularly or not treated.

Recent treatment pattern:

1, regular and occasional attenders; 0 irregular and exceptionally infrequent attenders.

In addition to these 2 analyses, the attitude—dichotomy was considered once more using the knowledge—dichotomy as a seventh regressor.

RESULTS

The results are given in 6 sections dealing with (1) dental diseases, (2) dental care, (3) the payment of dental care, (4) dental care for children, (5) the use of fluorides, and (6) factors affecting the level of knowledge and the attitudes. In the sections 1—5, the questions are given together with the frequency distribution of the answers. Answers in percentages of the respondents are given within brackets.

(1) Dental diseases

Qu. 1. »*What would you say are the main reasons that some people loose their teeth at an early age, while others keep theirs all their lives?*»

(213 persons were asked: 16 respondents would not give any reason, 128 gave one, while 69 respondents gave 2 reasons.)

a) Inheritance, congenital reasons (»Some are born with good teeth, some with bad» — »There are different kinds of teeth»)	107	(50)
b) Food habits, consumption of sweets	75	(35)
c) Tooth-brushing, cleaning	37	(17)
d) Treatment attendance	17	(8)
e) Economic reasons	9	(4)
f) Other, unclassified reasons	21	(10)
g) Don't know	16	(8)
	282	(132)

Table I. *Percentage of respondents with specified knowledge of and attitudes toward tooth-diseases, according to selected characteristics*

Characteristics	Qu. 1, alt. a Inherital causes for early tooth loss	Qu. 1, alt. b+c Bad foodhabits and/or inadequate toothbrushing cause early tooth-loss	Qu. 2, alt. a Have heard of gum disease	Qu. 3, alt. a Stated to have had gum disease
Sex				
Men (n=77)	47	61	76	31
Women (n=136)	52	48	75	18
AGE Group				
20—39 (n=40)	47	67	62	12
40—49 (n=69)	64	48	84	33
50—60 (n=104)	42	50	76	20
Family income				
Under 10.000 kr. (n=84)	42	59	68	15
10.000—19.000 kr. (n=72)	61	49	78	26
20.000 kr. + (n=57)	49	47	86	30
No. of teeth present				
Under 5 (n=83)	48	49	72	17
5+ (n=130)	52	55	78	27
School dental treatment				
Regularly or occasionally treated (n=68)	49	60	79	22
Irregularly or not treated (n=145)	51	49	75	23
Recent treatment pattern				
Regular and occasional attenders (n=43)	51	56	86	26
Irregular and exceptionally infrequent attenders (n=170)	50	52	74	22

Qu. 2. »*Gum disease (some people call it pyorrhea) is often marked by bleeding gums and loosening teeth. Have you ever heard of this disease?*»

a) Yes	162	(76)
b) No	47	(22)
c) Don't know	4	(2)
	213	(100)

Qu. 3. »*Have you ever had gum disease?*»

a) Yes	49	(23)
b) No	156	(73)
c) Don't know	8	(4)
	213	(100)

(2) Dental care

Qu. 4. »*Would you say that your fillings have been beneficial or would you rather say they have been useless?*»
(75) persons who reported not to have had any fillings were not asked.)

a) Absolutely beneficial	76	(55)
b) Beneficial for some years	39	(28)
c) Maybe serviceable for a short time, but they soon fell out	15	(11)
d) Absolutely useless	8	(6)
	138	(100)

Qu. 5. »*Do you think that tooth repair for adults is worth the bother, or would you rather say that one can do as well with a denture?*»

a) Dental care/tooth repair is absolutely preferable	82	(38)
b) Dental care/tooth repair is preferable if teeth are not too bad	65	(31)
c) Tooth repair might be worthwhile if one is born with strong teeth	42	(20)
d) A denture is preferable because it is cheap and does not cause much trouble	19	(9)
e) Other answers and don't know	5	(2)
	213	(100)

(*3*) *The payment of dental care*

Qu. 6. »*If you still had most of your own teeth, and your dentist recommended you to spend 500 kr. to have them repaired, would you spend that much money?*»

a) Yes (Provided I had the money)	167	(78)
b) No	19	(9)
c) Uncertain and don't know	27	(13)
	213	(100)

Qu. 7. »*Would you consider it right to have dental care for adults financed by public funds, or would you rather say that such expenses should not be a public charge?*»

a) Should be financed totally by public funds	13	(6)
b) Should be financed partly (subsidized) by public funds	106	(50)
c) Should not be public financing for well-off people, only for the needy	64	(30)
d) Should not be a public charge at all	20	(9)
e) Don't know	10	(5)
	213	(100)

Qu. 8. »*If a public financing of dental services is being introduced, a lot of people might queue up wanting treatment. If some kind of priority is needed, which people (groups) should, in your opinion, be given priority in the delivery of cheap services?*» (213 persons were asked: 12 respondents did not know, 107 gave one while 94 respondents gave 2 answers.)

a) Priority by economy		
1. People with a low income	116	(54)
2. People having many children	10	(5)
b) Priority by medical or social disadvantages		
1. The chronically ill or disabled	65	(31)
2. Widows, divorced, unmarried mothers	16	(8)
c) Priority by age		
1. Younger people	42	(20)
2. Elderly people (old age pensioners)	16	(8)
d) Priority by dental conditions		
1. People with bad teeth	19	(9)
2. People who have been taking care of their teeht	11	(5)
e) Don't know	12	(6)
	307	(146)

(*4*) *Dental care for children*

Qu. 9. »*Would you say that filling of milk teeth is worth the bother?*»

Table II. *Percentage of respondents with positive attitudes toward dental care and toward public financing of dental services, according to selected characteristics*

Characteristics	Qu. 5, alt. a+b Dental care/ tooth repair is preferable to a denture	Qu. 6, alt. a Would spend 500 kr. on dental care/ tooth repair	Qu. 7, alt. a+b Dental care should, in general, be financed by public funds	Qu. 9, alt. a Filling of milk teeth is worth the bother
Sex				
Men (n=77)	57	73	66	48
Women (n=136)	76	82	50	61
Age group				
20—39 (n=40)	82	82	70	52
40—49 (n=69)	74	87	57	54
50—60 (n=104)	61	71	50	60
Family income				
Under 10.000 kr. (n=84)	60	71	51	43
10.000—19.000 kr. (n=72)	67	80	64	62
20.000 kr. + (n=57)	84	86	53	68
No. of teeth present				
Under 5 (n=83)	53	69	45	58
5 + (n=130)	79	85	63	55
School dental treatment				
Regularly or occasionally treated (n=68)	79	85	63	49
Irregularly or not treated (n=145)	64	75	52	60
Recent treatment pattern				
Regular and occasional attenders (n=43)	91	93	44	72
Irregular and exceptionally infrequent attenders (n=170)	64	75	59	52

a) Yes	120	(56)
b) No	32	(15)
c) Other	6	(3)
d) Don't know	55	(26)
	213	(100)

Qu. 10. »*How often do you consider it necessary for a child to brush its teeth?*»

a) Once a day	24	(11)
b) Twice a day	148	(70)
c) After each meal	40	(19)
d) Don't know	1	(<1)
	213	(100)

Qu. 11. »*Would you consider the school dental service to be a good enterprise, or would you rather say that the community should be using the money for something else?*»

a) Consider it to be a good enterprise	211	(99)
b) Don't know	2	(1)
	213	(100)

Qu. 12. »*Were you anxious when going to the school dentist?*»
(Only the 91 respondents who had visited the school dentist were asked.)

a) Yes	44	(48)
b) Well, sometimes maybe	17	(19)
c) No	27	(30)
d) Don't know	3	(3)
	91	(100)

(5) *The use of fluorides*

Qu. 13. »*There have been some talk about using fluorides to prevent tooth decay. Have you heard of fluoridation of water supplies or of toothbrushing/rinsing with fluorides?*«

a) Heard of both	110	(52)
b) Heard only of water fluoridation	4	(2)
c) Heard only of brushing/ rinsing with fluorides	63	(29)
d) Not heard of any of them	29	(14)
e) Don't know	7	(3)
	213	(100)

Qu. 14. »*Do you approve of fluoridation of water supplies?*«

a) Yes	31	(15)
b) No	24	(11)
c) Don't know	158	(74)
	213	(100)

Qu. 15. »*Do you approve of toothbrushing/ rinsing with fluorides for school-children?*«

a) Yes	140	(66)
b) No	9	(4)
c) Don't know	64	(30)
	213	(100)

(6) *Factors affecting the level of knowledge and the attitudes*

Level of knowledge. The total explanatory power of the 6 independent variables considered by the regression analysis was relatively weak (R^2=.10, i.e. 10% of the variance). Recent treatment pattern, income, and sex appeared to be the most influential variables.

Attitudes. When considering the attitude—dichotomy by running the same 6 regressors, nearly 15% of the variance was explained. Recent treatment pattern was again found to be the best predictor by explaining 10% of the variance. Each of the regressors, number of teeth and sex added a little more than 2% to the understanding of why some people held positive while others held negative attitudes toward preventive and conservative dentistry.

When knowledge was introduced as a seventh regressor, the total explanatory power increased to 25%. Knowledge became the major predictor and took over some predictive strength from the variable, recent treatment pattern.

Interaction effects. The regression analyses were run without considering any interaction terms, and the resulting explanations were obviously oversimplified. As shown in Table IV, some of the independent variables were interrelated, particularly age and school dental treatment. However, none of these 2 variables revealed much strength under the regression analyses. Further interpretations and comments on the effect of the variables are given in the Discussion.

DISCUSSION

The method of collecting the data may be open to questioning. The respondents might have been influenced by knowing the interviewer to be a dentist. Social distance between interviewer and interviewee might also have affected the responses (*Galtung*, 1969). However, data from a previous study on the same group (*Helöe*, 1972) indicated that the inter-

Table III. *Percentage of respondents with knowledge of and positive attitudes toward the use of fluorides, according to selected characteristics*

Characteristies	Qu. 13, alt. a Have heard of water-fluoridation and of local treatment with fluorides	Qu. 14, alt, a Approve in fluoridation of water supplies	Qu. 15, alt. a Approve in toothbrushing/rinsing with fluorides
Sex			
Men (n=77)	51	10	58
Women (n=136)	52	17	70
Age group			
20—39 (n=40)	50	17	77
40—49 (n=69)	62	17	74
50—60 (n=104)	45	12	56
Family income			
Under 10.000 kr. (n=84)	40	13	58
10.000—19.000 kr. (n=72)	51	15	68
20.000 kr. + (n=57)	68	16	74
No. of teeth present			
Under 5 (n=83)	36	8	53
5 + (n=130)	62	18	74
School dental treatment			
Regularly or occasionally treated (n=68)	50	16	75
Irregularly or not treated (n=145)	52	14	61
Recent treatment pattern			
Regular and occasional attenders (n=43)	74	21	79
Irregular and exceptionally infrequent attenders (n=170)	46	13	62

Table IV. *Correlations between 8 dichotomized variables*[1]

Correlation matrix	Recent treatment pattern	Sex	Age	Income	Number of teeth	School dental treatment	Knowledge
Recent treatment pattern	1.00						
Sex	0.14	1.00					
Age	0.23	0.11	1.00				
Income	0.27	—0.04	—0.03	1.00			
Number of teeth	0.38	0.00	0.39	0.11	1.00		
School dental treatment	0.20	—0.01	0.60	—0.03	0.34	1.00	
Knowledge	0.24	0.13	0.03	0.20	0.06	—0.05	1.00
Attitude	0.32	0.18	0.16	0.11	0.26	0.11	0.39

[1] The definition and the dichotomy of the variables are explained under Material and Methods.

viewed responded conscientiously. Inconsistent and incorrect reports could usually be traced back to inaccurate questioning or inadequate knowledge among the respondents. In the present study, it seemed unlikely that the responses to questions referring to facts were biased by the interview setting. As to the questions dealing with attitudes, the responses should be regarded as expressed opinions, not as inner thoughts (*Galtung*, 1969). There are reasons for presuming that the construction of indices added validity to the results (*Hellevik*, 1971), and thus made them suitable for the present analytical purpose.

The level of knowledge seemed to vary with the topics. Early tooth loss was, at least partly, ascribed to inherital factors by every second respondent (Question 1), even of those who attended treatment regularly (Table I). Forty-one respondents illustrated their statements with stories about persons who lost their teeth regardless of thorough care. Dental fatalism among low-rank groups is well recognized (*Koos*, 1954; *Kriesberg & Treiman*, 1960; *Straus*, 1961; *Kriesberg*, 1963; *Dummet*, 1970; *Ettinger*, 1971). However, in the present group, only a minority cast doubt on the value of conservative treatment (Questions 4 and 5). Seemingly, most respondents believed that edentūlousness was worth delaying, provided the cost of treatment could be afforded (Question 6).

Out of the regular and occasional treatment attenders, only every fourth person reported to have experienced »gum-disease» (Table I). A clinical examination, however, revealed that all respondents with some teeth remaining had gingivitis or periodontitis (*Helöe*, 1972). It seems justified to question whether the patients had been given adequate and clear-cut information on oral disease from their dentists. Findings reported in other studies support the assumption that this had not been done (*Bamford, et al.* 1969; *Putnam et al.* 1967; *Allen*, 1969; *Bulman, et al.* 1968).

The school dental program was almost unanimously praised (Question 11). Apparently, the interviewed were more concerned about the dental health of children than that of their own. This point of view is also held by others (*Kriesberg & Treiman*, 1962; *Smith*, 1962; *Signorile et al.* 1968). The common desire for subsidized treatment (Question 7), and the priority patterns (Question 8) were probably influenced by the present dental health program, and by the social situation of the respondents. The ignorance of water fluoridation should be seen in context with the social characteristics of the group (*Bulman et al.* 1968; *Linn*, 1969; *Petterson*, 1970; *Jensen*, 1971; *Motz*, 1971). In addition, the community did not have a waterworks which made fluoridation possible.

Despite the narrow social range of the present group with regard to residence, education and recipient status, the responses tended to vary with background characteristics. However, the relationship between the independent variables (Table IV), should be kept in mind. For instance, the strongly interrelated variables, age and school dental treatment, were in turn related to number of teeth. Thus, under the regression analyses, the latter predictor explained some variance in attitudes which would otherwise have been explained by the other two. It seemed, however, likely that number of teeth also had some independent effect. For instance, the treatment preferences of those with a minimum or no teeth (Table II) were probably influenced by the fact that pros-

thodontic treatment was the only realistic alternative to them personally. As to the variables, age and school dental treatment, these were seemingly reflecting different qualities such as personal and recent experiences (Questions 2 and 3, Table I), self-interest (Question 7, Table II), and levels of »new knowledge» (Question 15, Table III). Surprisingly, those who had attended regular school dental treatment favoured filling of primary teeth less frequently than did the rest of the group. (Question 9, Table II). It is possible that the responses were influenced by the common practice in school dental clinics to extract decayed primary teeth or to leave them untreated.

Women appeared better informed than men about the value of treating the first dentition. On the other hand, proportionately more women than men seemed to be unaware of their periodontal disease (*Helöe*, 1972). Totally, the variable, sex was found to have some predictive strength on knowledge, as well as on attitudes. It has been pointed out that women are more likely than men to see a dentist regularly, and to acknowledge dental health as worthwhile (*Siirilä*, 1966; *Richards*, 1971; *Smedby*, 1972).

Attitudes toward dental health generally appeared more favourable than treatment behaviour. However, under the regression analyses, attitudes and recent treatment pattern were nevertheless clearly interrelated, and in turn each of them were related to the variables, knowledge and income (Table IV). Even with this interaction effect taken into consideration, it appeared evident that the level of knowledge had clearly influenced the attitudes.

It is well known that socioeconomic factors influence treatment behaviour (*Richards*, 1971; *Smedby*, 1972), and that the same factors are associated with level of knowledge (*Pratt*, 1971), and with dental health attitudes (*Koos*, 1954; *O'Shea & Gray*, 1968). Attitudes and knowledge tend to reflect experiences and situationally established behaviour (*Kriesberg*, 1963), and may even be causally related to dental health practices (*Rayner*, 1970). The present study did not provide sufficient information for statistical evaluation of causal relations. However, it seemed likely that situational factors such as economy, general and dental health status, working situation, and availability of dentists had affected knowledge and attitudes as well as treatment behaviour. No clear indication was found for presuming that knowledge and attitudes had played important and independent roles in the seeking of dental care.

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