Utilization of dental services in a disadvantaged, rural population

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The use of dental services was studied through personal interviews with 216 pensioners and welfare recipients aged 20—60 who had attended a subsidized dental health program. The respondents were living in a rural community in Norway, and the levels of education and income within the group were generally low. Eighty-four respondents had less than 5 remaining teeth. Only 20% of the group sought dental care regularly or occasionally, whereas 49% had not visited a dentist for at least 5 years. Regular treatment attenders were mostly to be found among respondents with 5 or more teeth, among women, among persons younger than 50, and among those with the highest income.

Denture services and extractions were the most common types of treatment sought by the greater number of respondents. Thirty-five per cent of the group stated that they had never had to have a tooth filled. High costs were declared to have been an obstacle to treatment attendance by 77% of the respondents.

Key-words: Public health services; community health services; rural population; socioeconomic factors

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Utilization of dental services is a most determining factor affecting dental status and treatment needs (*Young & Striffler*, 1969). Utilization studies, which describe and analyze the distribution of dental services, may therefore provide valuable means for the evaluation of the systems under which dentistry is offered to the public.

Dental treatment patterns within socially and economically deprived groups have not been outlined in the Scandinavian countries. Furthermore, no information is available for estimating the influence of school dental programs on the current treatment behaviour of underprivileged individuals.

The aim of the present study was to provide data on and possibly identify factors affecting the use of dental services in a group of disadvantaged, rural dwellers.

MATERIAL AND METHODS

In a small, rural community situated in southern Norway, all subjects aged 20—60 receiving social security or economic support under some welfare scheme were invited to attend a state-subsidized dental

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Table I. *Number of respondents according to income, sex and age*

Income in 1.000 kr.	Sex	Age group 20—39	40—49	50—60	Total Men	Women
10	Men	3	4	17	24	
	Women	16	18	29		63
10—19	Men	6	12	13	31	
	Women	7	18	16		41
20—	Men	4	6	13	23	
	Women	7	11	16		34
Total		43	69	104	78	138
					216	

health program (*Helöe*, 1971). This population subgroup totalled 280 persons, of whom 216 attended the program. Information on taxable family income was obtained through the official tax roll (Table I).

Using a pre-tested questionnaire, the participants were interviewed by the author. Information concerning 3 participants had to be obtained from their parents because of the participants' illness.

The interview-items were related to (1) frequency of dental visits, (2) types of treatment received, and (3) situational barriers to treatment attendance. The exact wording of the questions are given in the Results.

At the end of the interview, background information on education and occupation was recorded. Formal education was generally restricted to primary school, only 10 persons out of 216 had a formal education exceeding one year after elementary school. Nearly all men were lumberjacks, construction workers, or pensioners, whereas most women were housewives or pensioners. Information on the number of remaining teeth was obtained by a questionnaire previously reported (*Helöe*, 1971). The degree of accuracy of this information (*Helöe*, 1972) was considered satisfactory for the analysis of the present data.

Treatment of the data

Sex, age, income, number of teeth, school dental treatment, and recent treatment pattern were used as independent variables for the analysis of data obtained by 11 of the questions. The 2 latter variables were derived from the answers to Questions 2 and 5, respectively. Each independent variable was related to positive treatment behaviour appearing from the answers to Questions 1, 2, 4, 5, 6, and 7 (Tables II and III), whereas negative statements were used for the analysis of the answers to Questions 8, 10, 12, 13 and 14 (Tables III and IV).

Data on regular and occasional treatment attendance (Question 5), which was regarded as key information, was considered by means of a multiple regression analysis with dichotomized (»dummy») variables (Table V). Besides the factors: sex, age, income, number of teeth, and school dental treatment, 2 other factors

were introduced as independent variables: attitude towards conservative dental treatment, and grade of disability. These 2 factors will be further discussed in later papers.

RESULTS

The results are given in 4 sections dealing with (1) frequency of dental visits, (2) types of treatment received, (3) situational barriers to treatment attendance, and (4) factors affecting regular and occasional treatment attendance. Under the sections 1—3, the questions are listed together with the number of answers to each alternative. Answers in percentages of the respondents are given within brackets.

(*1*) *Frequency of dental visits*

Qu. 1. »*How old were you (approximately) when you first visited a dentist?*«

a) Under 7 years of age	24	(11)
b) 7—9 years of age	75	(35)
c) 10—14 years of age	56	(26)
d) 15—19 years of age	34	(16)
e) 20 years of age or more	21	(10)
f) Have never been to a dentist	1	(<1)
g) Don't know	5	(2)
	216	(100)

Qu. 2. »*Have you ever been treated by the school dentist, and if so, did you visit him regularly in your school days?*«

a) Went to the school dentist annually, mostly for fillings and check-up treatment	35	(16)
b) Went to the school dentist for a period of 3—6 years, mostly for fillings and check-up treatment	35	(16)
c) Went to the school dentist for less than 3 years	24	(11)
d) Have not been treated by the school dentist	122	(57)
	216	(100)

Qu. 3. »*Did you visit a dentist regularly after leaving school, when you were 15—20 years old?*«

(Only those 70 persons who had been treated for 3 or more years by the school dentist, were asked.)

a) Went to a dentist regularly (annually) for check-up	10	(14)
b) Went to a dentist occasionally (2—4 times in 5 years) for check-up	5	(7)
c) Went to a dentist only for emergencies	42	(60)
d) Did not visit a dentist during those years	13	(19)
	70	(100)

Qu. 4. »*When did you last visit a dentist?*«

a) Within the last year	75	(35)
b) 1—4 years ago	38	(18)
c) 5—9 years ago	33	(15)
d) 10—19 years ago	45	(21)
e) 20 or more years ago	24	(11)
f) Have never been to a dentist	1	(<1)
	216	(100)

Qu. 5. »*Would you say that you have seen a dentist regularly during the last 5 years?*«

a) Have made regular (annual) check-up visits	30	(14)
b) Have made occasional check-up visits (2—4 times in 5 years)	14	(6)
c) Have only made visits for emergencies	66	(31)
d) Have not visited a dentist during the last 5 years	106	(49)
	216	(100)

Table II. *Percentage of respondents with frequent dental visits, according to selected characteristics*

Characteristics	Qu. 1, alt. a+b Went to dentist before reaching 10 years of age	Qu. 2, alt. a+b Went to school-dentist 3 years or more for tooth filling and check-up	Qu. 4, alt. a Went to dentist within the last year	Qu. 5, alt. a+b Went regularly or occasionally to a dentist during the last 5 years
Sex				
Men (n = 78)	44	33	28	13
Women (n = 138)	47	32	38	25
Age group				
20—39 (n = 43)	92	91	51	26
40—49 (n = 69)	51	21	39	32
50—60 (n = 104)	23	3	25	11
Family income				
Under 10.000 kr. (n = 87)	41	30	23	11
10.000—19.000 kr. (n = 72)	47	36	35	17
20.000 kr. or more (n = 57)	51	32	53	38
No. of teeth present				
Under 5 (n = 84)	29	12	15	1
5 or more (n = 132)	57	45	47	33
School dental treatment				
Regularly or occasionally treated (n = 70)	89	—	47	31
Irregularly or not treated (n = 146)	25	—	29	15
Recent treatment pattern				
Regular and occasional attenders (n = 44)	59	50	93	—
Irregular and exceptionally infrequent attenders (n = 172)	42	28	20	—

(2) *Types of treatment received*

Qu. 6. »*What kind of service did you receive at your first visit to a dentist?*«

a) Check-up	4	(2)
b) Fillings	39	(18)
c) Extractions	154	(71)
d) Other	2	(1)
e) Don't know	17	(8)
	216	(100)

Qu. 7. »*What kind of services did you receive at your last visit to a dentist?*« (73 persons gave more than one answer.)

a) Check-up, clean, periodontal treatment	36	(17)
b) Fillings	64	(30)
c) Extractions	88	(41)
d) Denture services	100	(46)
e) Other	11	(5)
	299	(139)

Table III. *Percentage of respondents receiving specified types of dental treatment, according to selected characteristics*

Characteristics	Qu. 6, alt. a+b Received fillings and/or check-up at the *first* dental visit	Qu. 7, alt. a+b Received filling and/or check-up at the *last* dental visit	Qu. 8, alt. b Never had a tooth filled	Qu. 10, alt. a Wore an upper denture before reaching 20 years of age
Sex				
Men (n = 78)	18	22	45	13
Women (n = 138)	21	38	30	21
Age group				
20—39 (n = 43)	42	46	0	7
40—49 (n = 69)	15	42	22	16
50—60 (n = 104)	14	19	59	24
Family income				
Under 10.000 kr. (n = 87)	14	24	44	20
10.000—19.000 kr. (n = 72)	19	26	38	22
20.000 or more (n = 57)	30	51	19	11
No. of teeth present				
Under 5 (n = 84)	10	2	58	31
5 or more (n = 132)	26	51	20	10
School dental treatment				
Regularly or occasionally treated (n = 70)	37	49	3	4
Irregularly or not treated (n = 146)	12	24	51	25
Recent treatment pattern				
Regular and occasional attenders (n = 44)	30	96	0	5
Irregular and exceptionally infrequent attenders (n = 172)	17	16	44	21

Qu. 8. »*Have you ever had a tooth filled?*»

a) Yes	140	(65)
b) No	76	(35)
	216	(100)

Qu. 9. »*If you have had all your upper teeth extracted, at what age did you have the last of them out?*

a) Before 20 years of age	38	(17)
b) 20—29 years of age	60	(28)
c) 30—39 years of age	25	(12)
d) 40 or more years of age	12	(6)
e) Have not had all upper teeth extracted	81	(37)
	216	(100)

Qu. 10. »*If you have got an upper denture, at what age did you get your first one?*»

a) Under 20 years of age	39	(18)
b) 20—29 years of age	65	(30)
c) 30—39 years of age	32	(15)
d) 40 or more years of age	14	(6)
e) Never had an upper denture	66	(31)
	216	(100)

Table IV. *Percentage of respondents stating specified obstacles to treatment attendance, according to selected characteristics*

Characteristics	Qu. 12, alt. a Have abstained from dental visit because of high costs	Qu. 13, alt. c Would not be able to raise kr. 500 for dental care within a week or two	Qu. 14, alt. a Had trouble with getting away from work (home) when seeing a dentist
Sex			
Men (n = 78)	80	37	13
Women (n = 138)	75	53	16
Age group			
20—39 (n = 43)	77	47	19
40—49 (n = 69)	74	45	14
50—60 (n = 104)	79	49	13
Family income			
Under 10.000 kr. (n = 87)	75	61	10
10.000—19.000 kr. (n = 72)	89	47	18
20.000 kr. or more (n = 57)	65	26	18
No. of teeth present			
Under 5 (n = 84)	95	54	12
5 or more (n = 132)	65	43	17
School dental treatment			
Regularly or occasionally treated (n = 70)	69	47	16
Irregularly or not treated (n = 146)	81	47	14
Recent treatment pattern			
Regular and occasional attenders (n = 44)	59	25	14
Irregular and exceptionally infrequent attenders (n = 172)	81	53	15

(3) *Situational barriers to treatment attendance*

Qu. 11. »*How is it that you have rarely seen a dentist during the last years?*»
(38 persons who considered themselves regular treatment attenders were not asked, thus, answers were obtained from 178 persons who gave one or more reasons.)

a) Could not afford treatment	128	(72)
b) Afraid to visit the dentist	57	(32)
c) Have had no trouble with the teeth/dentures. Teeth were so bad that treatment was pointless	52	(29)
d) Have been too busy. Dentist too far away	17	(10)
e) Have been too ill to go, disabled	12	(7)
f) Laziness, kept putting it off	9	(5)
g) Other reasons	5	(3)
	280	(158)

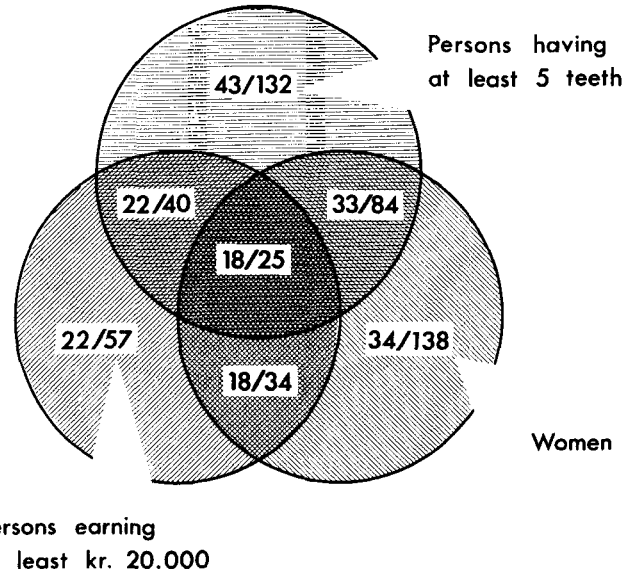

Fig. 1. *Frequencies of those* seeing a dentist regularly or occasionally during the last 5 years. The figure illustrates the predictive strength of the factors: number of teeth, income, and sex on *treatment patterns. For in*stance, of all persons who had at least 5 teeth (132 persons), 43 were regular or occasional treatment attenders. Of those who in addition earned at least 20.000 kr. (40 *persons*), 22 were »regulars» or »occasionals». By the combination of all three factors (shown in the middle of the figure), it appeared that of all women with at least 5 teeth, and with an income of 20.000 kr. or more, 18 out of 25 were regular or occasional treatment attenders.

Qu. 12. »*Have you ever abstained from visiting the dentist because of high costs?*»

a) Yes	166	(77)
b) No	37	(17)
c) Don't know	13	(6)
	216	(100)

Qu. 13. »*If your dentist recommended you to spend kr. 500.— on necessary dental care (or on a new denture), would you be able to raise this amount of money within a week or two?*»

a) Yes	60	(28)
b) Well, sometimes I might, at other times I might not	50	(23)
c) No	102	(47)
d) Don't know	4	(2)
	216	(100)

Qu. 14. »*Did you have any trouble during the last years in getting away from work (home) when seeing a dentist?*»

a) Yes	32	(15)
b) Rarely	69	(32)
c) No	113	(52)
d) Don't know	2	(1)
	216	(100)

(4) *Factors affecting regular and occasional treatment attendance*

44 persons (20 % of the group) reported to have seen a dentist regularly or occasionally during the last 5 years (Question 5, Table II). Of the variables examined by the regression analysis; number of teeth, income and sex accounted for nearly all the explained variance concerning these treatment patterns (Table V, Fig. 1). In contrast; disability, age, attitude and school dental treatment could only contribute with a minor additional explanation to the understanding of why some persons did, while others did not, see a dentist frequently.

Table V. *Variance explained in regular or occasional treatment attendance during the last 5 years*

	Variance explained (cumulative values)
No. of teeth	0.14
Income	0.20
Sex	0.22
Disability	0.23
Age	0.24
Attitude	0.25
School dental treatment	0.25
All variables (R^2)	0.25

DISCUSSION

It seems likely that dental treatment patterns may be grouped into 4 main categories based on the use of dental services.

(1) Regular treatment attendance implies that the subjects are seeing a dentist regularly (annually) on a check-up basis, which include preventive measures, and when needed, restorative treatment.

(2) Occasional treatment attendance describes the behaviour of those who seek restorative treatment chiefly as a result of self-diagnosis, for instance to have a filling replaced or to have a painful tooth attended to. It is reasonable to suppose that these patients prefer a filling to an extraction.

(3) Irregular treatment attendance (pain-oriented treatment pattern) is characterized by a use of dental services mainly restricted to extractions and denture services.

(4) The term exceptional or terminal treatment attendance may be used for describing the behaviour of individuals or groups who rarely or never visit the dentist. This pattern might be an ultimate stage of category 3.

The borderlines between types of attendance may be vague, the categories may overlap, or the treatment pattern of subjects may change. In spite of these modifications, it seems likely that the classification listed above might be useful when estimating the level of effective demand for dental services in a population.

Number of teeth

The most important factor affecting the likelihood of a visit to a dentist, is whether the person concerned has any natural teeth or not (*Kriesberg & Treiman*, 1960; *Gray et al.*, 1970; *Smedby*, 1972).

In Sweden, 36 % of all adult persons with some or all natural teeth remaining are estimated to have obtained treatment twice during the last 2 years (*Smedby*, 1972), and may presumably be considered as regular treatment attenders. Approximately 40 % of the adult population in England and Wales who have some natural teeth, see a dentist on a regular basis (*Gray et al.*, 1970).

In the present study, 20 % of those with some natural teeth (n = 149) were registered as regular treatment attenders, and an additional 9 % as »occasionals». On the other hand, every fifth respondent with some natural teeth had not seen a dentist for 10 years or more. An equivalent proportion stated that they had never had a filling. Thus, even of those who had some teeth remaining, at least 20 % should be grouped as exceptional or terminal treatment attenders, according to the classification suggested above.

No comparable information is available concerning the general population in Norway. However, there are reasons for presuming that the regular use of dental services within the study group lagged behind that of the general adult population, even when differences in dental status are taken into account.

Income

Income proved by the regression analysis to be the second most influential predictor of regularity in recent dental visits (Table V). This finding corroborates previous observations concerning the heavy impact made by socio-economic factors on treatment patterns (*Bonwell & McNamara*, 1957; *Kriesberg & Treiman*, 1960; *Kriesberg*, 1963; *Smedby*, 1965; *National Center for Health Statistics*, 1966; *Bulman et al.*, 1968; *Richards*, 1971). In addition, the present finding suggests that relatively slight differences in income may distinguish even between treatment behaviour

of individuals living within a narrow, social setting.

Frequencies of dental visits and types of treatment received, reported at the first and the last visit to a dentist, seemed to be associated with the income variable (Tables II and III). On the other hand, attendance at the free school dental program was evenly spread over all the 3 income levels (Table II).

Considering the recent treatment patterns and the economical obstacles reported by most respondents (Table IV), it seemed that the vast majority of those with a minimum income had great difficulties in meeting dental expenses. This appeared to be particularly true concerning the high proportion of people needing adequate prosthetic treatment (*Helöe*, unpublished data).

Sex

It is well documented that women are more diligent in seeking dental care than men (*Smedby*, 1965; 1972; *National Center for Health Statistics*, 1966; *Bulman et al.*, 1968; *Moen & Poetch*, 1970; *Richards*, 1971). The present observations conformed with this general trend.

Previous studies have outlined the interaction between attitudinal factors and regular use of dental services (*Koos*, 1954; *Freidson & Feldman*, 1958; *Kegeles*, 1963; *Kriesberg*, 1963; *Jonsson & Wictorin*, 1967; *O'Shea & Gray*, 1968; *Gray et al.*, 1970). In the present study, similar relations were found. For instance, women were more likely than men to value conservative dental treatment. Under the regression analysis, the effect of the mere attitude variable was disguised by the variables: number of teeth and sex. Thus, the difference between men and women regarding regular treatment attendance may possibly be explained by the hypothesis that values and attitudes are particularly important factors for going to the dentist for preventive treatment (*Kriesberg & Treiman*, 1960). Furthermore, women seem more willing than men to follow recommended health practices (*Kasl & Cobb*, 1966).

Other causes of the uneven treatment patterns among men and women may be found in the way their working day is organized (*Bulman et al.*, 1968). It should also be noted that in the present group, relatively more men than women were seriously disabled (*Helöe*, unpublished data). However, most respondents stated that they rarely had any trouble in getting away in order to see a dentist (Question 14). Seemingly, the question appeared irrelevant to some persons because they had rarely sought treatment for many years.

Age and school dental treatment

Free school dental treatment was gradually introduced in the study community in the 1930s (Hedmarksplanen). Consequently, younger persons were the most likely to have been favoured by the system (Table II). As appear from Tables II and III, younger persons and participants in the school dental treatment program were far more likely than others to have made a recent dental visit, to have received conservative treatment recently, and on the whole; to have had personal experiences with conservative dentistry. The proportion of regular and occasional treatment attenders in the age group 40—49 tended, however, to be slightly higher than among people younger than 40 (Table II). Possibly, the utilization-rate of the youngest age group may have been influenced by the low level of income among younger women (Table I) and the working situation of the men (*Helöe*, 1971).

When considering the influence of age and school dental treatment on the recent

treatment pattern, it should be noted that these 2 independent variables were strongly interrelated and could hardly be considered separately. Furthermore, grade of disability (the disability variable) was also associated with age. The relatively small predictive strength of these 3 variables (Table V) may in part be explained by the fact that each of them was correlated with the variable: number of teeth. Thus, this factor seemed to account for much of the variance that would otherwise have been explained by age, school dental treatment, or disability.

Dental health of younger people, as measured by the occurrence of dentures by the age of 20, seemed to have improved over the last decades (Question 10, Table III). Apparently, the school dental treatment had brought about a decrease in the frequency of early tooth loss, which in turn caused an increase in the frequency of dental visits. It is, however, doubtful whether an overall change of treatment behaviour has taken place: less than one-third of those favoured by the school dental program turned out to be regular treatment attenders as adults (Table II). After leaving school, the majority of the young people seemed to have been falling back to treatment patterns similar to those of the older people in the group.

Conclusions

Dentistry seemed to have been used, by most respondents, as a last resort from pain. The likelihood of the occurrence of pain was reduced concurrently with the decrease in the number of teeth. Persons in possession of a full denture returned infrequently to a dentist. The best predictors of regular or occasional treatment attendance were; number of teeth (≥ 5 teeth), income ($\geq$ kr. 20.000), and sex (women).

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