

# Effect of instruction and motivation on dental knowledge and behavior among wearers of partial dentures

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Patients receiving partial dentures were divided into three groups. One «maximum» group was taught and motivated, both individually and as a group, as thoroughly as possible. The second «medium» group was given instruction sheets describing the essential facts related to the cleaning and maintenance of teeth and dentures, but no individual instruction and motivation were provided. In the third «minimum» group the obtaining of information was left entirely to the initiative of the patients themselves. By the end of the period of treatment, the patients' knowledge was in proportion to the amount of teaching they had received. As regards dental health behavior, the groups did not differ significantly from one another, although there were some indications that increased knowledge and motivation had promoted positive oral hygiene habits. A year after the completion of treatment the positive behavior habits were markedly fewer in all groups, and no longer bore any relation to the amount or type of instruction or motivation given.

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Intensive prophylaxis and motivation focused on individual patients not only prevent the development and progress of periodontitis (2, 6, 7, 8) but also decisively reduce the development of caries (2). Individual prophylaxis, however, demands a considerable health personnel, and is obviously not a realistic possibility as a universal method. Group education, instruction and motivation therefore seem worthy of consideration as providing an alternative to individual education, instruction and motivation. It is known that the patients' knowledge and positive behavior habits can be improved

by distributing leaflets, showing diapositives, and other means of group teaching (4, 5, 10). There is no certainty, however, that the increased knowledge and improvement in behavior habits will be retained over a longer period (1).

The purpose of the present study was to investigate how information, instruction and motivation given in three different modes influence the amount of knowledge and level of health behavior within a year, among a selected group of patients, viz. those receiving partial denture treatment.

## MATERIAL AND METHODS

In 1976, partial dentures were made at the Helsinki University Institute of Dentistry for 92 persons. A year later, the institute was able to get in contact with 89 of these people, and they formed the subjects of the present study.

At the beginning of treatment, the patients were divided at random into three groups: the «minimum» group A, «medium» B, and «maximum» C. In the course of the prosthetic therapy, the «minimum» Group A received no instruction concerning such measures as oral hygiene, the cleaning of the dentures, or post-therapeutic inspections. The dental student treating the patients was however told to answer any questions the patient asked. The patients in the «medium» Group B were given a 4-page leaflet describing in detail the etiology of dental diseases, emphasizing the adverse effects possibly arising from partial dentures, and giving detailed instructions on

how the adverse effects could be reduced. The students treating the individuals of this group were supposed to answer the patient's questions but not to initiate discussion of any problems. As regards the persons in the «maximum» Group C, every effort was made to teach them and, above all, to motivate them as thoroughly as possible toward oral cleanliness and proper dental maintenance care. At the beginning of the treatment, this «maximum» Group C also received the same leaflet as the «medium» Group B. At all visits, dental diseases in general and the special problems related to each individual's dentition and dentures were discussed, on the initiative of the student. The information contained in the leaflet was supplemented by an album of photographs illustrating the most essential points, and the patient looked at the album together with the student.

All but two of the patients had been treated in other departments of the Insti-

Table 1. Composition of the groups on the basis of age, sex, social stratum and number of years of schooling, as well as the extent of the periodontal treatment required.

	Group			Total
	A («minimum») (N)	B («medium») (N)	C («maximum») (N)	
Age				
Up to 40	9	7	5	21
41 - 60	11	17	11	39
61 and over	10	7	12	29
Sex				
Male	15	12	10	37
Female	15	19	18	52
Social stratum				
Upper and middle	3	14	6	23
Skilled workers	12	8	8	28
Unskilled workers	6	5	2	13
Farmers, fishermen and the like	0	0	0	0
The others: the retired, students and the like	9	4	12	25
Number of years of schooling				
Up to 8	25	18	16	59
9 - 11	4	6	8	18
12 and more	1	7	4	12
Extent of periodontal treatment required				
None or limited	8	7	5	20
Medium	19	20	19	58
Extensive	3	4	4	11
Total	30	31	28	89

tute of Dentistry prior to their prosthetic therapy and thus, independent of the instruction covered by the present study, had been exposed to the standard information program of other departments in the Institute, which included health education and motivation.

Despite the random distribution, the groups were not fully homogenous (Table 1). The «minimum» Group A contained relatively more men and fewer representatives of the highest social strata than did the other groups; also, the educational level of the patients in Group A was lower than that of the other patients. As regards oral hygiene and periodontal status – and hence, by indirect inference, the level of health behavior as well – the groups were equal, as measured by the need for periodontal treatment (according to the criteria used by the Periodontal Department of the Institute).

To investigate the patients' knowledge of dental care, they were asked 15 knowledge-testing questions – prior to the beginning of any treatment in the Institute. The means of the number of right answers were tested by the one-way analysis of variance, and there was no significant difference between the groups.

At the end of the prosthetic treatment, when the patients had worn their dentu-

res for a fortnight, all patients from all groups were asked 12 questions testing their knowledge, based on the leaflet that had been distributed to two of the groups. Only four of the questions with their suggested possible answers are discussed and given below:

1. In general, how continuously should a partial denture be worn? (always; only during the daytime; don't know)
2. After how long an interval would it be wisest to come for the next inspection of the teeth and dentures? (after six months; after a year; after 2–3 years; after 4–5 years; only after the dentures or teeth have caused trouble)
3. Is it possible that the alveolar ridge may still changing its shape three months after dental extractions? (very probably; possibly; probably not; certainly not; don't know)
4. How frequently should toothpicks or dental floss be used? (daily, whether food is felt between the teeth or not; only when food-residues are felt; in general it is not needed at all; don't know)

In the same questionnaire the statement appeared that people in general do not always act the way they know they should, and the patients were requested

Table 2. Correct answers to four of the 12 knowledge-testing questions at the completion of treatment. Mean and standard deviation of correct replies to all 12 questions

(Size of the group)	Group						P	Total	
	A («minimum» (30))		B («medium» (31))		C («maximum» (28))			(89)	
	N	(%)	N	(%)	N	(%)		N	(%)
Wearing of denture during night	9	(30)	19	(61)	21	(75)	<.01	49	(55)
Next visit for treatment	15	(50)	24	(77)	22	(79)	<.05	61	(69)
Resorption after extractions	6	(20)	7	(23)	10	(37)	N.S.	23	(26)
Use of toothpicks	28	(93)	28	(90)	26	(93)	N.S.	82	(92)
$\bar{x}$	5.23		6.07		7.43		<.01	6.21	
S.D.	1.87		2.28		1.91		–	2.20	

Significance of the differences between the means:

A - B : P = N.S.

A - C : P <.001

B - C : P <.05

to give honest answers to the following four questions:

1. Did you wear your partial denture last night?
2. When did you last use a toothpick, dental floss or interdental brush?
3. Do you use a toothpaste which contains fluoride?
4. When do you believe you will really come for inspection or treatment next time?

The replies to these four questions were taken as the indicators of denture wearing and dental health behavior habits at the close of treatment.

Thirteen months after the completion of treatment the patients were sent a questionnaire which contained eight questions concerning their current dental behavior. The questions are given in Table 4.

The replies to the questions concerning knowledge were classified as correct or incorrect. On the basis of the questions relating to behavior, the patient's behavior was interpreted as either positive or negative, according to whether it corresponded to the instructions as formulated in the instruction leaflet. For example, brushing natural teeth twice a day was interpreted as positive, less frequent brushing as negative. For the patient to keep the denture in his mouth during the

night was classified as negative behavior, for him to remove it was classified as positive.

Differences between the groups were tested question by question by the chi-square test. The means and standard deviations of the number of correct answers or positive behavioral habits were tested by the one-way analysis of variance. If the difference between the three means proved to be significant, the t-test was used between the pairs of the means.

## RESULTS

At the completion of treatment, the patients were able to answer correctly on the average six of the twelve questions testing their knowledge. The more instruction the group had been given, the higher was the mean value of the amount of knowledge; the analysis question by question of the inter-group differences, with one exception, showed the same trend (Table 2). The only exception was found in the reply concerning the correct use of toothpicks; the proportion of correct answers to this question was roughly the same in all the groups (Table 2).

At the completion of treatment the behavioral habits did not seem to vary significantly from one group to the other (Table 3). The only statistically significant difference between the groups was

Table 3. Patients with positive habits at the completion of treatment. Mean and standard deviation of the habits in the groups

(Size of the group)	Group						P	Total	
	A		B		C			(89)	
	(«minimum» (30) N	(%)	(«medium» (31) N	(%)	(«maximum» (28) N	(%)		N	(%)
Denture not worn during preceding night	10	(33)	17	(59)	21	(75)	<.01	48	(55)
Toothpick used on the preceding day	24	(80)	25	(81)	20	(74)	N.S.	69	(78)
Fluoride-containing toothpaste used	25	(83)	25	(81)	20	(71)	N.S.	70	(79)
Intended to pay a treatment visit within a year	20	(20)	25	(81)	23	(82)	N.S.	68	(76)
$\bar{x}$	2.63		2.97		3.00		N.S.	2.78	
S.D.	1.03		0.91		0.82		-	0.93	

in the wearing of the denture; the more emphasis had been given to the removal of dentures for the night, the greater the frequency of the habit.

A year after the completion of treatment, the patients still had a good half of the positive behavioral habits which had been taught them (Table 4). With one exception, the behavior of the groups was independent of the amount and type of instruction and motivation given to the group. This exception was regular use of toothpicks, which was most common in the group that had received most information and motivation.

DISCUSSION

The sample of the present study was drawn from the population of patients treated with partial dentures in a dental teaching institute. The results cannot therefore apply to the total adult population in Finland or even to all patients treated at the Institute. It is possible that the present sample represents only those prosthetic patients of the Institute who are treated with removable dentures.

There was a bias in the composition of the groups due to the fact that the group receiving «minimum» instruction con-

tained fewer members of the highest social strata and fewer highly educated people than the other groups. Had the behavior of the members of this group at the completion of the study proved to be more negative than in the others, this observation might have been criticized as having resulted from the composition of the groups (9). As there was, however, no such observation, the exceptional character of the «minimum» Group A apparently had no undue effect.

The knowledge-testing questions, posed at the completion of the treatment, were of a practical nature, and some of them were concerned with matters that had probably been discussed when the patients visited other departments of the Institute. Thus, it might have been expected that the proportion of correct answers would have been higher than the slightly over 50% recorded. The instructions and motivation, to be sure, were given on the Institute's premises, which are not designed for instructional purposes, and by «semi-professionals», i.e. dental students. These two factors may have somewhat reduced the efficacy of the instruction.

As could be expected, at the completion of treatment the level of knowledge

Table 4. Patients with positive habits one year after treatment. Mean and standard deviation of positive habits in the groups

(Size of the group)	Group						P	Total	
	A		B		C			N	(89)
	(«minimum» (30))	(%)	(«medium» (31))	(%)	(«maximum» (28))	(%)			
Denture not worn during preceding night	14	(45)	15	(50)	12	(43)	N.S.	41	(46)
Toothpick used the preceding day	12	(39)	12	(40)	21	(75)	< .01	45	(51)
Had been treated during the past year	14	(44)	9	(30)	13	(46)	N.S.	36	(40)
Natural teethbrushed twice a day	25	(78)	23	(77)	21	(75)	N.S.	69	(77)
Denture cleaned twice a day	28	(88)	22	(73)	20	(71)	N.S.	70	(78)
Brush used to clean the denture	30	(100)	31	(100)	28	(100)	N.S.	89	(100)
Soap or other purifying agent used to clean the denture	24	(75)	18	(60)	21	(75)	N.S.	63	(70)
Effervescent tablets used to clean the denture	11	(35)	8	(28)	3	(11)	N.S.	22	(25)
$\bar{x}$	4.83		4.42		4.75		N.S.	4.66	
S.D.	1.51		1.59		1.67		-	1.58	

of the group which was given individual instruction was higher than in the other groups. However, the inter-group differences – though statistically significant – were objectively small. While the group that had received most instruction replied correctly to an average of seven out of the twelve questions, the members of the «minimum» Group A had obtained, on their own initiative, so much information that the mean value in Group A was five correct answers. It is true that the patients in the «minimum» group could have obtained some of their knowledge in other departments of the Institute. However, the main part of the questions dealt with prosthetics and we therefore believe that the results were not influenced by information obtained elsewhere.

The assimilation of information provided through instruction leaflets was relatively poor: measured by the mean value, «minimum» Group A and «medium» Group B did not differ at all, but the analyses question by question showed that the members of «medium» Group B knew the correct answer more often than the members of «minimum» Group A. Hence, the benefit from the leaflet-instruction was of some statistical significance. In practice, however, this difference was almost non-existent.

The behavior of the subjects was based on self-reported data, and we do not know how reliable the answers really were. There is, however, no reason to believe that one of the groups had given answers less reliable than the others. Therefore, even though the real frequencies of the behavioral habits could be unreliable, the existent or non-existent differences between the groups seem actual.

The questions concerning behavior at the completion of treatment were practical and of a general nature. Although they were formulated in such a way as to correspond to the recommendations of the Department of Prosthetics, the subject-matter of some of them may have

been discussed during visits to the Institute's other departments as well. Therefore, on the grounds of the present study no conclusions may be drawn as to the effect of knowledge upon health behavior over a short time-interval. However, the replies to the question concerning the wearing of a denture during the night, a matter most probably not discussed in the other departments, suggest that behavior over a short time-interval can be positively affected by increased knowledge.

The behavior of the patients a year after the completion of treatment presents a relatively gloomy picture of the possibility of modifying health behavior in such a population as is represented by the subjects of the present study. The patients' later behavior did not correlate with the amount of instruction and motivation given, and positive health behavior was markedly less frequent a year later than a year earlier at the time of the treatment. For example, the habit of wearing dentures at night is apparently governed by factors other than correct information, since the proportion of those who wore dentures at night was the same in all groups. The number of patients using toothpicks had fallen from 78% to 51%, and while three-fourths had earlier intended to pay a visit for treatment within a year, only 40% reported to actually having done so.

Damage to teeth and periodontal tissues often caused by partial dentures can be nearly totally eliminated by careful post-therapeutic treatment, for which a recall-system appears to be an essential factor (3). The Prosthetic Department at the Helsinki Dental School, which conducted the present study, has not sufficient personnel for an adequate recall-system. Therefore, we have tried to motivate the patients to take care of themselves, for instance to visit private dental offices for post-therapeutic care. The present study shows, however, that we do not have a system for motivation, which can substitute an adequate recall-system.

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