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ORIGINAL ARTICLE

Denture wearer's perception of ambient care. Part 2. Analyses of data

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Abstract

Objective. The aim was to investigate to what extent denture wearers were satisfied with the ambient care (care) received. ***Materials and methods.*** A study sample of 117 completely edentulous and 56 partially edentulous patients, who had received their dentures in the period 1997–2005 at Bergen School of Dentistry, completed a questionnaire containing eight specific items regarding different aspects of care, each with two positive (*a* and *b*) and two negative (*c* and *d*) categories, and four global items. The care items, including confidence in the dental team, information, waiting time and cost, constitute the Ambient Care Scale; the global items were concerned with overall care, satisfaction with dentures, self-reported oral and general health. ***Results.*** Between 91–100% of Ambient Care Scale responses were in the two positive categories. The completely edentulous group was significantly more satisfied than the partially edentulous group regarding several Ambient Care Scale items and oral health. Also, ratios between categories *b* and *a* showed systematic higher degrees of satisfaction for the completely edentulous group than the partially edentulous group. Fifty-six per cent in the completely edentulous group and 36% in the partially edentulous group were very satisfied, i.e. with ≥6 of 8 possible responses in category *a*. Analysis of the very satisfied showed that the highest degrees of satisfaction for both groups were found regarding students and staff, the lowest regarding cost and waiting times. ***Conclusions.*** Patient satisfaction with care was very high. Completely edentulous patients were systematically more satisfied than partially edentulous ones.

Key Words: *denture complete, patient acceptance of treatment, treatment ambiance, dental school*

Introduction

Understanding what influences patient satisfaction has been the subject of a plethora of theoretical models. Most of these have been developed in regard to physician–patient relationship. Only one such model has been made specifically for dentistry [1]. This model indicates a number of areas that might influence the clinical outcome, both in terms of the patients' subjective opinion as well as more objective measures. Among such areas are characteristics of patient, dentist and the clinical setting.

With regard to the latter, providing the patient with a high quality treatment outcome is obviously important. Perhaps equally important, and in accordance with the above model, is the ambience in which patients are generally taken care of by the dental team during the clinical encounters. This ambient care, subsequently called care, is created by both dentist and auxiliary personnel, in the way they care for and communicate with the patient. This may be related to aspects like the interpersonal relationships established between members of the dental team and the patient, but also to time taken for completion of treatment, especially relevant for patients treated in a dental school, and cost. In a recent study, partly using the same patient material and the same variables as the present study, such aspects have been combined into a preliminary scale called Ambient Care Scale (ACS), which has been tested for and found to have acceptable reliability and validity [2].

It seems reasonable to assume that care, as defined above, is particularly important for patients wearing complete dentures because of the severe psychological and social implications often associated with this state, above all in cultural settings where edentulousness is often scorned. Although numerous studies

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have been conducted regarding various aspects of patient satisfaction with the way they are being taken care of by the dental team when treated with complete dentures (for review, see Newsome and Wright [3]), it is difficult to find reports that convincingly indicate universal factors in this respect. Such studies made in different countries such as Britain [3,4], the US [5-7], Greece [8] and Japan [9] may of course be highly relevant within their respective cultural settings, but not necessarily in others [9]. It is therefore difficult to compare or extrapolate findings unless inter-cultural comparative studies are made which indicate what are universal variables and what are not.

Patient satisfaction with treatment is multidimensional [3,7,10] and it seems probable that patient satisfaction with the care provided by the dental team is equally so. Multi-item and commonly used instruments such as Dental Satisfaction Questionnaire (DSQ) [11] and Oral Health Impact Profile 20 (OHIP−20) [12,13] have been constructed in order to capture different dimensions of patient satisfaction with *treatment*. However, neither is designed for, nor are they intended to measure specifically the effects of the *ambient care* provided by the dental team. To our knowledge no evidence has been published indicating that patient satisfaction with treatment and ambient care are interchangeable measures. For the above reasons, neither instrument seems appropriate for measuring patient satisfaction with care.

Answers to simple global questions regarding different aspects of care may perhaps not, to the same extent as scale instruments like DSQ and OHIP-20, reveal all or most relevant dimensions within a concept. However, in accordance with the generally accepted theory of cognitive dissonance [14], a patient who expresses satisfaction with care is unlikely to drop out from treatment. This is of special importance in dental school settings, which are dependent on patients in order to function as teaching institutions.

Consequently, in a study of whether patients feel that they have been well taken care of in the dental school, without delving profoundly into the details of whys and wherefores, such simple questions may suffice—at least as a first step. From the point of view of patient recruitment to any dental school, if the responses are largely positive, the conditions surrounding the treatment should be maintained; if they are negative, it is necessary to look into the reasons why.

This study is part of a number of on-going [15,16] and future investigations prompted by insufficient knowledge regarding various aspects of denture wearer's experience with dentistry. In one of these studies [15] highly significant differences in self-reported oral health and satisfaction with dentures were found between edentulous patients wearing complete dentures in both jaws and partially dentate patients wearing a complete denture only in the maxillary jaw. For that reason it would be of interest to see if the two groups of patients had different responses with regard to ambient care.

The aim of this study was to investigate to what extent patients previously attending a dental school clinic and treated with one or two complete removable dentures were satisfied with the way they had been taken care of in the dental clinic. To this end some aspects regarding the ambiance surrounding attendance and treatment have been explored.

Materials and methods

Sample

As part of an extensive survey all 294 patients ≤76 years of age who had received one or two complete dentures at the student clinic, School of Dentistry, Bergen, Norway in the period 1997–2005 were invited by letter and telephone to a clinical examination and to complete a questionnaire. The examination was free of charge. If a treatment need was discovered the patient would be referred to appropriate departments for treatment. Of the 294 patients, 176 (60%) responded. The reasons for not responding (n = 118) were: unable to contact/other reasons (n = 61), not attending the appointment (n = 21), the patient was satisfied with the dentures and saw no point in having an examination (n = 20), deceased (n = 11) and illness (n = 5). Of the responders 117 patients had complete dentures in both jaws, 56 had a complete denture in the maxillary jaw and three had a single complete denture in the mandibular jaw. The latter were excluded from the study because they were considered atypical. The entire study sample thus consisted of 173 individuals; divided into a completely edentulous group (CE) and a partially edentulous group (PE). The completion of the questionnaire was carried out immediately following the clinical examination.

Questionnaire

The questionnaire was self-administered and consisted of eight items, each with two positive (*a* and *b*) and two negative (*c* and *d*) pre-determined response categories. These items constitute the Ambient Care Scale (ACS) [2], which in a recent study has shown acceptable psychometric properties. The possible range of this scale is between 8–32, where low scores indicate a high degree of satisfaction. The scale contains various aspects related to how patients perceived that they had been taken care of by the dental team at the university clinic. The wording of the eight items, response categories and results are shown in Table I. The questionnaire additionally contained global items on how patients were overall satisfied with the ambient care they had received, the degree of satisfaction with their

Table I. Items, response categories, results and significance of differences between groups.

ACS items	Categories	CE group *n* (Valid %)	PE group *n* (Valid %)	*p*
1. Did you have confidence in the student treating you?	*a*. Very good confidence	82 (71)	36 (66)	
	b. Good confidence	31 (27)	16 (29)	0.445
	c. Not altogether good confidence	1 (1)	3 (6)	
	d. No confidence	2 (2)	0	
2. Were the teachers obliging?	*a*. Very obliging	88 (77)	35 (64)	
	b. Obliging	24 (21)	19 (35)	0.094
	c. Not altogether obliging	2 (2)	1 (2)	
	d. Not at all obliging	1 (1)	0	
3. Were the dental nurses obliging?	*a*. Very obliging	96 (82)	36 (66)	
	b. Obliging	21(18)	18 (33)	0.015*
	c. Not altogether obliging	0	1 (2)	
	d. Not at all obliging	0	0	
4. Were you consulted regarding the aesthetics of the dentures	*a*. To a very large extent	66 (57)	25 (46)	
	b. To a large extent	42 (36)	25 (46)	0.169
	c. To some extent	3 (3)	2 (4)	
	d. To a small extent	5 (4)	3 (5)	
5. Did you get sufficient information before, during and after treatment?	*a*. To a very large extent	60 (52)	28 (52)	
	b. To a large extent	51 (44)	24 (44)	0.956
	c. To some extent	1 (1)	1 (2)	
	d. To a small extent	4 (3)	1 (2)	
6. Did you have to wait unduly for the clinical instructor?	*a*. As expected	97 (83)	42 (78)	
	b. Somewhat longer than expected	17 (15)	11 (20)	0.453
	c. Much longer than expected	1 (1)	1 (2)	
	d. Unacceptably long	2 (2)	0	
7. Did the treatment take too long?	*a*. As expected	91 (78)	35 (64)	
	b. Somewhat longer than expected	22 (19)	16 (29)	0.048*
	c. Much longer than expected	3 (3)	4 (7)	
	d. Unacceptably long	1 (1)	0	
8. Did you find the treatment expensive?	*a*. Inexpensive	51 (44)	17 (31)	
	b. Acceptable expense	62 (53)	34 (62)	0.065
	c. Quite expensive	1 (1)	3 (6)	
	d. Unacceptably expensive	2 (2)	1 (2)	
Global items				
1. How did you feel that you were taken care of at the university clinic?	*a*. Very well taken care of	77 (66)	27 (49)	
	b. Well taken care of	34 (29)	27 (49)	0.053
	c. Not all together well taken care of	4 (3)	1 (2)	
	d. Not at all well taken care of	1 (1)	0	
2. To what extent are you overall satisfied with your dentures?	*a*. Very satisfied	35 (30)	13 (24)	
	b. Satisfied	60 (51)	24 (44)	0.112
	c. Not quite satisfied	15 (13)	15 (27)	
	d. Dissatisfied	7 (6)	3 (6)	
3. In general, do you regard your oral health to be	*a*. Very good	15 (13)	2 (4)	
	b. good	63 (54)	23 (43)	
	c. Neither good nor bad	32 (28)	21 (39)	0.003**
	d. Bad	4 (3)	7 (13)	
	e. Very bad	2 (2)	1 (2)	

Table I. (*Continued*).

ACS items	Categories	CE group *n* (Valid %)	PE group *n* (Valid %)	*p*
4. In general, do you regard your general health to be	*a*. Very good	16 (14)	5 (9)	
	b. good	56 (48)	29 (52)	
	c. Neither good nor bad	16 (14)	10 (18)	0.849
	d. Bad	24 (21)	11 (20)	
	e. Very bad	5 (4)	1 (2)	

*$p < 0.05$, **$p < 0.01$.

dentures and how they regarded their oral and general health (Table I) and demographic information (age and sex).

Ethical approval

The project was approved by the Norwegian Committee for Medical Research Ethics, Health Region West and registered at the Norwegian Social Science Data Services. All participants were informed of the purpose of the study and consented by responding to the invitation.

Data analysis

Statistical analyses were made using PASW statistical package version 18 for Windows. Descriptive statistics and the ratios between responses in category *b* and *a* were calculated for all variables. Pearson's Chi-square test was used to test for possible differences in age and sex distribution between the CE and PE groups. The Mann-Whitney test was used to test each item within each group for possible age and sex differences. For these analyses age (in 2006) was dichotomized into ≤67 years (the official Norwegian retirement age) and ≥68. The Mann-Whitney test was also used to test each item for possible differences in score between the CE and PE groups. Spearman rank correlations were calculated between the global item on satisfaction with care (global item # 1), the ACS items and the remaining global items.

Each patient could in theory have between 0 and 8 responses in category *a* to the eight ACS items. The number of patients with category *a* responses according to their frequencies of occurrence for the CE and PE groups was counted. Those who had ≥6 such responses were arbitrarily defined as having *Overall very positive responses*; those who had <6 were defined as having *Overall less positive responses*. Exclusively regarding those who had *Overall very positive responses*, the frequency of patients was counted for each of the ACS item. The difference between the respective percentages of the CE and PE group was tested using Wilcoxon's signed ranks test.

A 5% significance level was chosen for all analyses.

Results

Demographics

The mean age of the CE group was 68 years (range 38–76, SD = 6.5); there were 59 females and 58 males. The mean age of the PE group was 66 years (range 44–76, SD = 7.5); there were 25 females and 31 males. There were no significant age or sex differences between the two groups ($p = 0.370$ and $p = 0.478$, respectively). Regarding age differences for each of the items, in the CE group younger patients tended to be more satisfied with the information received (ACS item # 5, $p = 0.018$) and with their oral health (global item # 3, $p = 0.046$) than older ones. The other items, including the global ones, showed no age differences, with *p*-values ranging between 0.059–0.889. In the PE group younger patients tended to be less satisfied with the teachers (ACS item # 2, $p = 0.018$) and the dental nurses (ACS item # 3, $p = 0.008$), but more satisfied with their oral health (global item # 3, $p = 0.046$) than the older ones. Regarding sex differences for each of the items, no significant differences were observed for either group, with *p*-values ranging between $p = 0.112$ and $p = 0.958$.

Distributions

The distribution of the responses to the eight items of the ACS and the global items are shown in Table I. In the CE group, between 93–100% of the responses to the ACS items were in the two most positive categories (*a* and *b*). In the PE group the comparable responses to ACS items ranged between 91–99%. Regarding the global items the results were generally lower and had a wider spread: Whereas 95% in the CE group and 98% in the PE group responded in categories *a* and *b* regarding their general satisfaction with care (item # 1), the other global items similarly ranged between 62–81% in the CE group and between 46–67% in the PE group.

Despite the consistently high numbers of positive responses to the ACS items, the distribution of category *a* and *b* varied within the items (Table II). Thus, the relative levels of responses in category *b* to

Table II. Ratio between number of responses in category *b* and *a*.

ACS item*	CE	PE
1	0.38	0.44
2	0.27	0.54
3	0.22	0.50
4	0.64	1.00
5	0.85	0.86
6	0.18	0.26
7	0.24	0.46
8	1.22	2.00
Global items		
1	0.44	1.00
2	1.71	1.85
3	4.20	11.50
4	3.50	5.80

*For complete texts for the items, see Table I.

category *a* (*b*/*a*) ranged between 0.18–2.00 within the ACS items. Within the global items the corresponding relative level varied between 0.44–11.50.

The ACS sum score was 10.9 for the CE group; 11.7 for the PE group.

Comparison between groups

The results of the analyses regarding possible differences between the two groups for each item are shown in Table I. Patients from the CE group were more satisfied with the dental nurses (ACS item # 3, $p = 0.015$) and the treatment time (ACS item # 7, $p = 0.048$) than those from the PE group. Equally, patients from the CE group were more satisfied with their oral health (global item # 3, $p = 0.003$) than those from the PE group. The other items, including the global items showed no significant differences with *p*-values ranging between 0.053–0.956. The difference between the two groups regarding mean ACS sum only approached statistical significance ($p = 0.079$).

Category a responses

The number and percentage of category *a* responses to the eight ACS items for each patient and group were counted. In the CE group 56% of the patients ($n = 66$) had ≥6 such responses; in the PE group the comparable number was 36% ($n = 20$). In Table III the number and percentage of ≥6 category *a* responses in relation to each of the ACS items is shown. For all items the CE group had higher scores than the PE group and the differences were significant ($p < 0.001$).

Correlations

Table IV shows the correlations between global satisfaction with care (Global item # 1), the ACS items and the remaining global items. The same pattern emerged for the two groups: Global satisfaction with care was fairly strongly associated with patient confidence in student, the obligingness of the teachers and dental nurses and if they felt that they had received sufficient information about the treatment (ACS items # 1–3 and 5), with significant associations of approximately spearman rank correlation Rho = 0.4. Waiting times for instructors, length or cost of treatment (ACS items # 6–8) showed low associations; Rho ranging from 0.00–0.19. Of the remaining global items only satisfaction with dentures in the CE group showed a significant association (0.29).

Discussion

The present proportion of patients treated in a dental school satisfied with the care received may appear surprisingly high (Table I), particularly in view of the fact that they were treated with complete dentures, which may have a significant impact on facial appearance and psychosocial aspects [17,18]. However,

Table III. Number of patients with overall very positive responses (≥6 in category *a*) counted for each ACS item.

	CE group		PE group		
ACS item*	*n*	Valid %	*n*	Valid %	Differences between groups %
1. Confidence in student	61	53	19	35	18
2. Obliging teachers	64	56	19	35	21
3. Obliging dental nurses	65	56	20	36	20
4. Consulted on aesthetics	51	44	15	27	17
5. Sufficient information	49	42	18	33	9
6. Wait unduly for instructor	63	54	19	35	19
7. Treatment took too long	60	51	19	35	16
8. Cost	41	35	9	16	19

*For complete texts for the items, see Table I.

Table IV. Correlations between the global satisfaction with care, ACS items and remaining global items.

		CE		PE	
Item type	Item*	Rho	*p*	Rho	*p*
ACS items	1. Confidence in student	0.474	< 0.001***	0.374	0.005**
	2. Obliging teachers	0.421	< 0.001***	0.455	< 0.001***
	3. Obliging dental nurses	0.435	< 0.001***	0.387	0.004**
	4. Consulted on aesthetics	0.266	0.004**	0.250	0.065
	5. Sufficient information	0.390	< 0.001***	0.497	< 0.001***
	6. Wait unduly for instructor	0.112	0.232	0.000	0.999
	7. Treatment took too long	0.025	0.790	0.236	0.083
	8. Cost	0.194	0.037*	0.192	0.159
Remaining Global items	2. Satisfaction with dentures	0.286	0.002**	0.231	0.090
	3. Self-reported oral health	0.170	0.069	0.078	0.575
	4. Self-reported general health	0.062	0.507	0.111	0.420

*For complete texts for the items, see Table I.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

others have reported similar [5,19] or somewhat lower [20] figures with aspects of patient satisfaction with care. Considerably lower figures have also been reported in which, before remedial measures were implemented; only 60% of the patients were satisfied [6]. However, the latter results were related to all kinds of dental treatment, so that direct comparisons are hardly appropriate.

In a dental school setting some general factors are said to affect patient satisfaction negatively such as time consumption [5,7], lack of organization, experience and clinical competence by the dental student [9]. In contrast, the present results indicate that neither waiting time for instructor, treatment time nor cost were highly associated with care (Table IV). This somewhat surprising finding may of course be caused by special local circumstances. On the other hand, there are also some positive factors favoring patient recruitment to dental schools such as lesser cost of treatment [5,7,9] and more time given to develop communication [20] and empathy [8] than what is perhaps common (or indeed possible) in a busy general dental practice. The fact that cost was presently poorly correlated with patient satisfaction with care may be due to the very low charge for this treatment in Bergen School of Dentistry. Even perceived quality of care has been found to be a positive factor in a dental school setting [7]; a finding that appears to be in contradiction to the fact that dental students normally have considerably less clinical proficiency than their post-graduate counterparts. The most likely explanation may be that the concept quality of care, as presently defined, is not synonymous with clinical quality. The latter is difficult for the patient to evaluate and is often judged by the patient on other criteria such as communication, rapport and empathy [3].

In terms of the present results the mentioned factors favoring positive patient satisfaction obviously must have been at play, whereas the negative ones to a large extent have been perceived as being of minor or no importance. In accordance with the recommendations of Newsome and Wright [3], much emphasis has explicitly been given to informing the dental student of the importance of establishing a favorable relationship with the patient and sufficient time was allocated to this end.

The time factor appears to be considerably less negatively conceived than expected. Perhaps this may be related to the fact that almost 3/4 of the study population was above the age of 62, which is the earliest possible retirement age in Norway. Consequently, most of them had ample time at their disposal. Likewise, the lack of experience by the dental student might be offset by the diligence and competence of the clinical instructors who, with few exceptions, were specialists in prosthodontics.

The positive responses to all the ACS items shown in Table I and the fact that as much as 56% of the CE group and 36% of the PE group had ≥6 of 8 possible responses in category *a* does not adequately explain existing differences in the degree of satisfaction with care or where problems are most likely to occur. To that end it is more useful to study the ratios between the responses in categories *b* and *a* (Table II). These were systematically lower and thus more positive (categories *b*/*a*) for CE patients than for PE ones for all ACS items. Equally, for both groups the waiting time for instructor (item # 6) showed the lowest ratio, whereas in terms of treatment cost (item # 8) the opposite was the case. The former finding was somewhat unexpected, as waiting time has been mentioned as a negative factor by others [5,7]. Less unexpected

was the fact that the majority of the patients felt that the cost of treatment (item # 8) was acceptable rather than inexpensive. The lesser degree of satisfaction with the cost of treatment, notwithstanding the fact that the dental school charge for complete maxillary and mandibular dentures was ~ 1/3 of the charge in the public dental service, testifies to the importance of cost in patient satisfaction with care, also indicated by others [5,7,9].

Given the skewness of distribution of ACS responses, the number of category *a* responses gives the clearest expression of differences in patient satisfaction in regard to the single items. The number of patients with ≥6 out of 8 possible responses in category *a* (Table III) thus shows a significant difference between the two groups. The more positive results of the CE group are seemingly illogical; in that, although the oral function in the CE group (patients with complete dentures in both jaws) is considerably inferior to that of the PE group (with only one maxillary complete denture), the former is significantly more satisfied with care than the latter. However, this is in agreement with previous findings in regard to several aspects of denture wear and self-reported oral health [15,16]. A suggested explanation was that satisfaction is a relative phenomenon. Thus, partially edentulous may be less satisfied because they compare their denture with the fixed natural mandibular dentition, whereas the completely edentulous compare a loose denture with another possibly even looser one. True, this argument applies specifically to satisfaction with dentures. However, it seems likely that the negative conception of their single denture may affect other aspects of their rendezvous with the dental team.

The results of the global items showed a wider distribution than those of the ACS items (Table I). Whereas, as expected, the distribution of responses as to how the patients felt they were taken care of (item # 1) was similar to those of the ACS items, the responses to the other global items indicated considerably lesser degrees of satisfaction. As with the ACS items the ratios between categories *b* and *a* were more positive (lower values) for the CE group than for the PE group (Table II).

In fact, to the extent that significant group differences were discerned, the results systematically showed a lesser degree of satisfaction with care in the PE group compared with the CE group. This was demonstrated regarding their satisfaction with the obligingness of the dental nurses (ACS items # 3), treatment time (ACS item # 7) and, to a highly significant degree, oral health (global item # 3) (Table I). The latter finding is all the more conspicuous in view of the fact that the PE group unquestionably was less orally handicapped than the CE group, but this is in keeping with the tendency mentioned above. The same pattern was seen in regard to the differences in ACS sum scores between the two groups, but the difference only approached statistical significance. However, it seems probable that with larger samples significance would have been achieved.

It cannot be precluded that this systematic difference in terms of satisfaction with care between the completely and partially dentate might be caused by some unknown confounding factors and the results should be interpreted with this in mind. However, the two groups were not different in terms of age and sex distribution, nor in terms of self-reported general health. Regardless, the set of circumstances surrounding patients treated with complete dentures at the Bergen School of Dentistry must be conceived as satisfactory. However, this state of affairs may rapidly change in step with changing conditions and should, therefore, be monitored with regular intervals so that remedial action may be taken as required.

Conclusions

Patient satisfaction with ambient care received in a dental school setting when treated with complete dentures was very high, with favorable responses by more than 90% for all ACS items. The degree of satisfaction with care was systematically less for partially edentulous than for completely edentulous. In terms of patient satisfaction with care, for both groups, confidence in the student, obligingness of teachers and dental nurses and sufficient information ranked highest; waiting times for teachers, treatment time and cost appeared to rank lowest.

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