

Predictors of satisfaction with surgical treatment

TØRE SØRLIE¹, HAROLD C. SEXTON¹, ROLF BUSUND² AND DAG SØRLIE²

¹Psychiatric Research Center, Department of Psychiatry and ²Department of Cardiothoracic and Vascular Surgery, University Hospital of Tromsø, Norway

Abstract

Objective. To investigate prospectively which medical, psychosocial or treatment-related factors predicted treatment satisfaction and to evaluate the adequacy of a preceding retrospective study which had examined the same factors. Furthermore, to examine the predictors and the stability of the major determinants of patient treatment satisfaction.

Design. Assessments made before admission, at discharge and 2 and 4 months after discharge were used to predict both the level and the rate of change in satisfaction with different aspects of treatment.

Setting. Three surgical departments at a University Hospital.

Study participants. Four-hundred and eighty-two patients electively admitted for several surgical conditions.

Results. The central treatment-related measures were the same in the retrospective and prospective studies: global satisfaction with treatment (GS), perceived quality of contact with the nursing (QCN) and medical staff (QCM) and provision of adequate treatment information (INF). More of the variance in GS was explained in the prospective study (48.7% versus 36.3%). GS was most influenced by treatment-related factors with QCN as the strongest predictor in both studies. Only a small portion of the variance in QCN and QCM could be accounted for by the characteristics of the patients. INF was predicted by characteristics of the patients, their illness and life situation and by treatment-related factors. QCN was the strongest predictor of INF. The relationships with the nursing and medical personnel appear to be the major determinants of both patient treatment satisfaction and patients' reception of adequate information about their condition and its treatment.

Keywords: global satisfaction with treatment, prediction, prospective design, quality of contact with the nursing and medical staff, treatment information

Several dimensions of patient satisfaction with treatment have been identified: global satisfaction, interpersonal aspects, competence, self-rated result, equipment, continuity of care, accessibility, orientation about information, bureaucracy, and costs [1]. Patient satisfaction or dissatisfaction has been shown to be influenced by patients' expectations, their medical condition and health status, psychosocial variables, and characteristics of the treatment [2,3]. Pre-surgical expectations have been shown to be significant predictors of post-surgical reports of experiences, dissatisfaction, and mood disturbance [4–6]. Patient satisfaction has been associated with improved collaboration with health services and compliance with medical recommendations [2,7–9] as well as with improved clinical outcomes and health status [10].

Of the different treatment-related factors influencing global satisfaction with treatment, contact with physicians has been most extensively studied. Over the course of time two areas of investigation have evolved: (i) the effects of physicians'

interpersonal skills and (ii) the effect of the provision of information to the patient upon patient recall and adherence. Barlett *et al.* [8] found that the quality of the interpersonal skills of the physicians influenced patients' satisfaction and recall more than the quantity of information and instructions that were provided. It appears that treatment outcomes are more favorable when patients feel they are active participants in care and that their problem has been discussed fully, when they feel encouraged to ask questions, feel emotionally supported, and when they share in the treatment planning process [11]. There is a need for more information about the influence of the interpersonal skills of the nursing staff upon treatment satisfaction and the result of treatment.

In a preceding retrospective study including 610 former surgical patients with various conditions, we investigated the associations between global satisfaction with treatment and a selection of medical, treatment-related and psychosocial factors that could influence the patient treatment experience

Address reprint requests to T. Sørli, Psychiatric Research Center, Department of Psychiatry, University Hospital of Tromsø, N-9291 Tromsø, Norway. E-mail: tore.sorlie@rito.no

[12]. The study included a variety of socio-demographic variables as well as measures of personality, well-being, emotional symptoms, ways of coping, smoking and alcohol habits, family interaction, social contact, subjective health and physical functioning, the severity of the illness, and the satisfaction with different aspects of treatment [13]. Several psychosocial measures and measures related to the experience of treatment were derived and used in the present study.

About 10% of treatment satisfaction could be explained by characteristics of the patients while 25% was explained by treatment experiences of which almost all was related to the perceived quality of contact with the nursing and medical staff.

However, there were several missing elements in the retrospective study such as: (i) no pre-treatment assessments of health-related issues; (ii) no expectations to treatment had been included; and (iii) on average, 10 months had elapsed between the index admission and the retrospective assessment, thus allowing life circumstances and health to influence the assessment of the treatment experience.

A prospective study was carried out to examine: (i) which medical, psychosocial, or treatment-related factors predicted global satisfaction with surgical treatment; (ii) to what degree were the findings in this prospective study consistent with the findings in the previous retrospective survey study and finally (iii) the predictors and the stability of the major determinants of patient treatment satisfaction.

Methods

Subjects

A large group of adult Norwegians consecutively admitted for elective surgery for various surgical diseases at a university hospital, agreed to participate in the study (484/1158, 41.8%, agreed to participate). There were 482 (195 women and 287 men, mean age 56.6 years) who provided adequate response. 33% were employed, the mean level of education was 10 years and 62.5% were married. The average length of the hospital stay was 6.4 days (SD=5.1).

The patients were hospitalized in the departments for urological, cardiac, and gastrointestinal surgery. Response rates and some characteristics of the eligible population, the non-responders and the study sample are shown in Table 1.

Those who declined to participate ($n=674$) were older, were more often female, fewer were married, fewer had coronary heart disease, and more were discharged after examinations without surgery (Table 1). The proportion of non-responders was probably related to the large number of questions that were asked during the course of the study. Probably the differences also indicate a lower physical and mental vitality among those who did not participate.

The sample was divided into a coronary group, those with cancer, and those with other surgical conditions. The first two groups represented the largest single diagnostic categories comprising 14.3 and 17.4% of the initial study sample respectively. These categories also gave the best differentiation

in terms of illness-related stress and level of physical functioning both before and after surgery.

Assessment procedure

Patients completed questionnaires 2 weeks prior to admission, at discharge and 2 and 4 months after discharge from the hospital. The questionnaires prior to and after admission were mailed. The physicians completed questionnaires when admitting and discharging the patients.

Measures of central aspects of the treatment situation

The 39-item patient satisfaction questionnaire used in the previous retrospective study [12] had been developed on the basis of contemporary theory about patient satisfaction [1] and its reliability had been systematically evaluated [13]. The questions were specifically related to aspects of the patients' experiences in different areas and presumably reflected more faithfully their specific reactions and judgements than questions that asked for general impressions and opinions would have [14]. A factor analytic approach yielded four treatment-related factors that were psychometrically adequate and used in the present study. The content of these dimensions: global treatment satisfaction, the quality of contact with the nursing staff, the quality of contact with the medical staff, and the provision of adequate treatment satisfaction are detailed in Table 2.

Treatment-expectations

This psychometrically adequate 6-item scale was derived in the present study and was used to measure the level of patient expectations (admission) and to which degree they had been fulfilled (discharge). The questions addressed the degree to which the patients expected to be cured, getting relief of symptoms and gaining knowledge about what to do oneself to become more healthy. They also addressed whether the patients expected the medical and nursing staff to convey such knowledge and instructions.

Physician time and time expectations

At discharge the patients recorded the number of minutes they had spoken with the physicians at admission and at discharge and the average daily amount of contact during their hospital stay. Patients made similar estimates about the optimum amount of contact. Their unmet need for contact was estimated as the difference between the optimal values and what they had received. Physicians time and time expectations for the three diagnostic groups are shown in Table 3.

Religious mindedness

A 3-item scale was used at discharge from the hospital. The questions addressed the degree to which the patients' internal belief systems had been supportive for them, whether they had been searching for spiritual help and used prayer for their health during their hospital stay.

Table 1 Characteristics of the eligible population, the non-responders and the study sample of Norwegian surgical patients at different time points

	Eligible population	Non-responders	Study sample			
			T1 ¹	T2	T3	T4
<i>n</i> (Response rate)	1158	674 (58.2%)	482 ²	369	347	345
Male/female	647/511	358/316	287/195	225/144	216/131	212/133
(% male)	(55.9)	(53.1)	(59.5)	(61.0)	(62.2)	(61.4)
Age [years (SD)]	58.4 (16.5)	59.3 (17.4)	56.6 (15.1)	54.7 (15.1)	55.3 (14.9)	55.5 (14.9)
Married (%)	655 (56.6)	351 (52.1)	301 (62.5)	234 (63.5)	218 (62.9)	222 (64.2)
Coronary illness (%)	124 (10.7)	54 (8.0)	69 (14.3)	50 (13.5)	44 (12.8)	44 (12.7)
Cancer (%)	218 (18.8)	133 (19.8)	84 (17.4)	63 (17.0)	60 (17.3)	64 (18.6)
No surgery (%)	318 (27.5)	227 (33.7)	92 (19.0)	70 (19.0)	52 (14.9)	53 (15.3)
Physical functioning (SD)	–	–	69.3 (20.3)	–	74.9 (16.2)	75.4 (18.0)
Subjective health	–	–	9.3 (7.3)	–	6.4 (7.2)	5.7 (7.3)

¹ T1, before admission to hospital; T2, at discharge from hospital; T3, 2 months after discharge from hospital; T4, 4 months after discharge from hospital. ²Of 484 responders 482 adequately completed the questionnaires. Significant differences when comparing the non-responders with the responders: they were older, $t(1141) = 2.56, P < 0.05$; more were female, $\chi^2(1) = 4.20, P < 0.05$; fewer were married, $\chi^2(1) = 13.10, P < 0.001$; fewer had coronary heart disease, $\chi^2(1) = 20.30, P < 0.001$; and more were discharged without surgery, $\chi^2(1) = 29.16, P < 0.001$.

Outcome measures

Subjective health

A 9-item scale had been derived from an original set of 16 items selected from the SF-36 [15]. It was completed by the patients before admission and 2 and 4 months after discharge from the hospital. The items assessed how the patients globally judged their health and compared it with the health of others, to which degree physical and emotional symptoms had caused any reduction in their daily life activities, and to which degree they had experienced pain. This measure was negatively scaled.

The level of physical functioning

A global measure of physical functioning had been constructed hypothesizing a continuous scale of physical functioning from 1 to 100 where a score of 100 corresponded to excellent physical health. The scale has acceptable psychometric properties with high inter rater reliability and high patient–clinician convergence (T. Sørli, H. Sexton, R. Busund and D. Sørli, unpublished work). The global measure of physical functioning was completed by the patients before admission and 2 and 4 months following discharge from the hospital.

Psychological well-being

From a set of 10 items selected from an original 32 item-questionnaire [16], a 7-item scale was derived from the retrospective study. It was completed before admission and twice after discharge.

Length of hospital stay

This was recorded by the physicians at discharge from the hospital.

Length of sick leave after surgery

This was recorded by the patients 4 months after discharge from hospital.

Psychological assessment instruments

The patients completed all of the following instruments.

Personality

The NEO-FFI [17] is an accepted 60-item measure of the five major common personality traits (neuroticism, extraversion, conscientiousness, agreeableness, and openness). These have been shown to be relatively stable over time and are thought to represent traits that are largely persistent throughout adult life [18]. Unfortunately the items representing the trait conscientiousness were inadvertently excluded from the questionnaire.

Health Locus of Control

The Health Locus of Control [19] is an 18-item measure about the expected relationship between one's own behavior and its consequences in health-related questions. The instrument has been shown to have three subscales corresponding to internal control, external control and chance control. They addressed the degree to which the person through his/her own efforts considered him or herself able to cure and prevent health problems and having control and responsibility for his/her own health. This measure was used before admission and 4 months after discharge.

Ways of Coping Questionnaire

The factor structure of the Ways of Coping Questionnaire had been examined in the previous retrospective study and a 5-factor model based on 26 of the original 66 items had been derived consisting of three passive and two active coping

Table 2 Measures related to the experience of central aspects of the treatment situation derived from the retrospective study [12] ($n=610$)

Global satisfaction with treatment (7 items) Cronbach's $\alpha=0.69$

- Were you satisfied with the treatment?
- Were you discharged at the appropriate time?
- Were you treated incorrectly?
- Was the treatment important for your illness/health problems?
- Were your expectations of the medical treatment fulfilled?
- Did you get necessary information about how examinations were to be done?
- Did you get necessary information about the results of examinations and tests?

The quality of contact with the nursing staff (8 items) Cronbach's $\alpha=0.88$

- Were the nursing staff caring?
- Did the nursing staff communicate in an understandable way?
- Did the nursing staff engage in you as a whole person?
- Did you feel confidence in the professional skills of the nursing staff?
- Did the same group of nursing staff take care of you during the hospital stay?
- Did the nursing staff spend enough time speaking with you?
- Did the nursing staff have adequate time for you when helping/nursing you?
- Did you manage to convey to the nursing staff what was important about your condition?

The quality of contact with the medical staff (6 items) Cronbach's $\alpha=0.82$

- Did the medical staff take care of you as a whole person?
- Did one physician have the responsibility for you?
- Did the medical staff communicate in an understandable way?
- Were the medical staff available when needed?
- Did the medical staff convey a caring attitude?
- Did you have confidence in the professional skills of the medical staff?

Adequate treatment information (6 items) Cronbach's $\alpha=0.79$

- Did you get adequate information about side-effects of medications?
- Were you prepared about difficulties in the home situation after hospital treatment?
- If you had difficulties, was something done to reduce the problem?
- Did you get instructions about what to do yourself to improve or to prevent aggravation?
- Have the medical or nursing staff spoken to you about preventive self-care and lifestyle changes?
- Has the information you got during the hospital stay resulted in any changes in your life-style?

Table 3 Physician time and expected physician time in minutes at admission, daily during hospital stay, at discharge from the hospital and combined compared in three diagnostic groups of Norwegian surgical patients ($n=482$)

	Coronary group		Cancer group		Other diagnosis		One-way ANOVA $F(2,366)$
	Mean	SD	Mean	SD	Mean	SD	
Physician time							
At admission	17.5	10.6	15.7	9.7	16.7	11.5	0.37
Daily	5.9	3.6	5.0	3.5	5.9	5.8	0.91
At discharge	12.0	8.5	9.2	6.9	8.0	6.4	7.32**
Combined	35.4	15.9	29.9	15.7	30.6	16.5	2.02
Expected physician time							
At admission	19.9	8.9	19.7	9.6	22.6	10.5	2.91
Daily	8.9	3.1	8.2	4.8	10.2	5.5	4.70*
At discharge	15.5	8.1	15.4	8.5	15.4	8.2	0.00
Combined	44.3	15.9	43.3	18.1	48.2	18.6	2.40

** $P < 0.001$; * $P < 0.01$.

factors (T. Sørli and H. Sexton, unpublished work). It was completed before admission, at discharge and 2 and 4 months after discharge from the hospital.

Emotional symptoms

An 8-item scale representing a pure emotional distress factor had been derived from the anxiety, depression, and somatic items of the Brief Symptom Inventory [20]. It was included in the present study before admission and 2 and 4 months after discharge from the hospital.

Illness-related stress

This was recorded at all time points rated on a 10-point Likert scale measure anchored from 'minor' to 'extremely serious'.

Measures of habits and aspects of the life-situation

The patients completed all of these measures.

Drinking behaviour

For this purpose AUDIT was used [21]. It was completed before admission and 4 months after discharge from the hospital.

Smoking habits

One single verbally anchored five-category item assessing the number of cigarettes smoked per day was completed before admission and 4 months after discharge from the hospital.

Level of physical activity

One single 10-point Likert scale measure extending from 'nothing' to 'daily' was assessed prior to admission.

Social contact

A 4-item scale measuring how likely the patients believed it to be that they would get necessary help if they were confined to stay in bed over time because of illness [22] was completed before admission at the hospital.

Family interaction

A 3-item scale derived from a 6-item measure [23] measuring perceived respect in the relationship to the closest person, was assessed before admission.

Note. The scales for religious mindedness, subjective health, psychological well-being, ways of coping, emotional symptoms, social contact, and family interaction had been derived through a factor analytic approach in the retrospective study and showed good psychometric properties. Inter-item reliability was measured in this study population and is reported in Table 4.

Measures of the medical aspects of the illness and treatment

All of these ratings were made by the physicians at discharge from the hospital. It was recorded whether the patients had

been treated operatively or had been discharged after further examinations without surgery.

Diagnosis

All of the ICD-9 diagnosis was recorded.

Severity of the illness

This was assessed on a 10-point Likert scale measure anchored from 'minor' to 'extremely serious'. Similar measures were completed about the success and the curative nature of the treatment, the chronicity of the illness as well as any complications and their seriousness.

Table 4 presents some measurement characteristics of the study sample. The standard instruments (NEO-FFI and Health Locus of Control) are not included.

Data analysis

Associations among predictors were tested by correlating their initial values. Except for a moderately high correlation between emotional symptoms and neuroticism ($r=0.65$), between having coronary disease and the severity of the disease ($r=0.58$), and between the quality of contact with the nursing and medical staff ($r=0.55$), all correlations were below 0.50. The possibility of colinearity effects among these predictor pairs was therefore included in the analysis. These effects appeared to be insignificant.

Multiple regression was used to estimate how the different demographic, psychological, social, medical and treatment-related variables influenced global satisfaction with treatment and the central treatment aspects that significantly explained its variance. A hierarchical relationship between the different groups of variables was used when entering them into the equation. Initially patients' personal characteristics and traits were taken into consideration. After having adjusted for the influence of these factors, treatment-related factors were taken into consideration. Assuming that the provision of information depended upon patient contact with the treatment staff, the contact factors were entered into the equation prior to the information factor.

The quality of the perceived contact with the medical staff and the provision of adequate treatment information were assessed at three time points. SAS Procedure Mixed [24] was used to construct growth curve models of these variables in order to estimate their stability over time.

The length of the sick leave before and the length of the hospital stay required logarithmic transformation in order to normalize distribution.

Results

Predictors of global satisfaction with treatment at discharge from the hospital

The variables influencing global satisfaction with treatment are shown in Table 5.

Altogether, 48.7% of the variance in global satisfaction with treatment could be accounted for. The pre-therapy levels of neuroticism and well-being, together explained 13.2% of the variance. The remaining variance was explained by

Table 4 Number of items, Cronbach's α , means, SDs and range for psychosocial measures before admission ($n=482$) and for measures related to the experience of treatment at discharge from hospital ($n=369$) in Norwegian surgical patients

Variables	Items (n)	Cronbach's	Mean	SD	Range
Subjective health	9	0.85	9.30	7.29	32
Well-being	7	0.92	17.43	5.90	28
Ways of coping					
Wishful thinking	6	0.78	7.62	4.97	24
Avoidance	6	0.68	9.25	4.42	24
Thinking it over	4	0.72	4.94	3.70	16
Goal oriented	5	0.70	10.99	3.71	20
Seeking support	5	0.77	8.24	4.48	20
Emotional symptoms	8	0.89	5.77	5.77	32
Illness-related stress	1		5.76	3.21	9
Social contact	4	0.77	9.73	3.26	16
Family interaction	4	0.81	10.05	4.77	20
Measures related to the experience of treatment					
Treatment expectations	6	0.83	51.91	7.85	48
Quality of contact with nursing staff	8	0.88	25.56	4.72	27
Quality of contact with medical staff	6	0.75	17.51	4.06	20
Adequate treatment information	6	0.80	11.12	5.28	24
Religious mindedness	3	0.78	3.21	3.06	12
Global satisfaction with treatment	7	0.72	18.32	4.17	26

Table 5 Predictors of global satisfaction with treatment in Norwegian surgical patients at discharge from hospital ($n=369$)

Predictors	β^1	SD ²	Beta ²	t	P	³ ΔR^2
Neuroticism	-0.084	0.029	-0.109	-2.876	0.004	0.069
Well-being	0.092	0.027	0.132	3.413	0.001	0.063
Quality of contact with nursing staff	0.256	0.038	0.290	6.660	0.000	0.238
Quality of contact with medical staff	0.166	0.046	0.162	3.604	0.000	0.046
Adequate treatment information	0.243	0.036	0.272	6.782	0.000	0.058
Need for more physician time	-0.521	0.158	0.120	-3.285	0.001	0.013
Sum R^2						0.487

¹ β is the unstandardized regression coefficient. ²Beta is the standardized regression coefficient. ³ ΔR^2 is the explained variance.

treatment-related variables: the perceived quality in the contact with the nursing staff (23.8%), the quality in contact with the medical staff (4.6%), the degree to which adequate treatment information had been provided (5.8%), and the need for more time spent with physicians during hospital stay (1.3%). It is noteworthy that neither age, sex, severity of the disease or expectations to treatment significantly influenced the global satisfaction.

Predictors of the perceived quality of contact with the nursing staff

The variables influencing the perceived quality of contact with the nursing staff are presented in Table 6. Only 7.7% of the total variance could be accounted for with the pre-therapy levels of neuroticism and extroversion together explaining 3.7% while the severity of illness and the pre-therapy

expectations explained the remaining 4%. Neuroticism and the severity of illness negatively influenced the quality of contact.

Predictors of the perceived quality of contact with the medical staff

The variables influencing the perceived quality of contact with the medical staff are presented in Table 7. Six variables accounted for 14.8% of the variance. The pre-therapy level of neuroticism and extroversion together explained 5.1% of the variance. Neuroticism negatively influenced the quality of contact. Age and belonging to the coronary group explained an additional 6.1% of the variance, while the pretherapy level of the expectations to treatment and the degree to which the treatment was judged as successful explained the remaining 3.6%.

Table 6 Predictors of the perceived quality of contact with the nursing staff in Norwegian surgical patients at discharge from hospital ($n=369$)

Predictors	β^1	SD ²	Beta ²	t	P	³ ΔR^2
Extroversion	0.114	0.057	0.099	1.987	0.048	0.025
Neuroticism	-0.105	0.042	-0.121	-2.475	0.014	0.012
Severity of illness	-0.153	0.066	-0.122	-2.317	0.021	0.016
Expectations of treatment	0.099	0.030	0.161	3.257	0.001	0.024
Sum R^2						0.077

For footnotes see Table 5.

Table 7 Predictors of the perceived quality of contact with the medical staff in Norwegian surgical patients at discharge from hospital ($n=369$)

Predictors	β^1	SD ²	Beta ²	t	P	³ ΔR^2
Age	0.050	0.013	0.188	3.985	0.000	0.043
Extroversion	0.120	0.048	0.122	2.552	0.048	0.034
Neuroticism	-0.102	0.035	-0.138	-2.916	0.004	0.017
Coronary illness	1.106	0.560	0.095	1.975	0.049	0.018
Expectations of treatment	0.087	0.025	0.165	3.430	0.001	0.027
Successful treatment	0.181	0.087	0.099	2.089	0.037	0.009
Sum R^2						0.148

For footnotes see Table 5.

Table 8 Predictors of provision of adequate treatment information in Norwegian surgical patients at discharge from hospital ($n=369$)

Predictors	β^1	SD ²	Beta ²	t	P	³ ΔR^2
Health Locus of Control-internal	0.108	0.037	0.120	2.901	0.004	0.038
Seeking support	0.097	0.043	0.093	2.276	0.023	0.014
Coronary illness	2.611	0.582	0.193	4.485	0.000	0.060
Degree of chronicity	-0.099	0.045	-0.093	-2.214	0.027	0.012
Being married or cohabiting	0.294	0.131	0.093	2.281	0.023	0.008
Quality of contact with nursing staff	0.250	0.048	0.253	5.213	0.000	0.141
Quality of contact with medical staff	0.261	0.057	0.227	4.619	0.000	0.038
Operated or not	1.616	0.526	0.128	3.070	0.002	0.015
Sum R^2						0.326

For footnotes see Table 5.

Predictors of provision of adequate treatment information

The variables influencing provision of adequate treatment information are presented in Table 8. Eight variables accounted for 32.6% of the variance. The pre-therapy level of internal health locus of control and the coping strategy 'seeking support' explained 5.2%. Belonging to the coronary group and the degree to which the illness was judged as chronic explained 7.2% of the variance with the latter negatively influencing the provision of information. Being married or cohabiting (living alone as reference category) explained an additional 0.8%.

Three treatment-related variables accounted for the remaining 19.4%: the experienced quality of the contact with the nursing staff (14.1%), the experienced quality of contact with the medical staff (3.8%), and whether or not the patient had been operated upon (1.5%).

Predictors of the instability of the perceived contact with the medical staff and of the provision of adequate treatment information

The rate of change in the perceived quality of contact with the medical staff was positively predicted if the patients had coronary disease (t (1098)=5.36, $P<0.0001$). The rate of

change in the perceived provision of adequate treatment information was positively predicted by the passage of time ($t(1121)=3.36, P<0.001$) and negatively by the perceived quality of contact with the nursing staff at discharge from the hospital ($t(1121)=-3.05, P<0.01$).

Discussion

This prospective study of patient treatment satisfaction included the major medical aspects of the illness and its treatment along with a variety of the psychosocial characteristics of the patients, and their experience of the treatment situation as possible predictors. It had been preceded by a retrospective study using essentially the same measures, thus making it possible to compare satisfaction with surgical treatment measured retrospectively and prospectively.

Factors influencing treatment satisfaction (Table 5) and a comparison of prospective and retrospective measurements

About one-half of the treatment satisfaction was predicted prospectively and one-third retrospectively [12]. Together the perceived quality of contact with the nursing and medical staff were the strongest predictors in both designs and explained 28% prospectively versus 25% retrospectively of the total variance. These measures were predominantly qualitative in content (Table 2). This is consistent with the study of Barlett *et al.* [8] who found that the quality of the interpersonal skills of the physicians influenced patients' satisfaction and recall more than did the quantity of teaching and instructions.

Treatment satisfaction was influenced more by adequate treatment information prospectively than retrospectively (6 versus 1%). The average time from the index admission and the assessment in the retrospective study was 10 months which probably accounts for this difference as the diversity of the treatment experience would be more clearly remembered when the assessment is carried out closer to the time of its experience. Besides, the quality of a human interaction may be more recollected over time than its informational content.

That the characteristics of the patients accounted for only 13% versus 10% of the variance in treatment satisfaction in the two studies would seem to indicate how strongly treatment satisfaction is related to the interpersonal skills of the staff.

In contrast with the findings of Aseltine *et al.* [25] in which post-treatment status contributed as much to retrospective assessments of change as did prospectively measured change, only 4% of the treatment satisfaction was related to the post-treatment status (subjective health) of the patient in the retrospective study [12]. This finding provides some validity to retrospective patient satisfaction surveys.

Factors influencing the contact with the nursing and medical staff (Tables 6 and 7)

Only 8% and 15% in the quality of the contact with the nursing and medical staff respectively could be explained

with almost all of the predictors being related to patient characteristics. Extroversion, neuroticism and the severity of illness predicted contact with nurses while age, extroversion, neuroticism and coronary illness predicted contact with the physicians (Tables 6 and 7). The respectively positive and negative influence of extroversion and neuroticism upon perceived contact with others has been documented earlier. In the study of Geerts and Bouhuys [26] in which non-verbal interpersonal interactions were studied, patients' support-seeking and interviewers' support-giving was positively related to patient extroversion and negatively related to patient neuroticism.

The negative influence of the severity of illness upon the perceived quality of contact with the nursing staff might partially reflect unmet expectations for relief among the most severely ill patients whereas the positive influence of age upon the perceived quality of contact with the medical staff may reflect different attitudes towards medical authority in older and younger people.

The positive influence of coronary illness upon contact with the medical staff probably reflects that these patients received more physician time during their hospital stay, especially at discharge from the hospital, than patients within other diagnostic groups (Table 3).

Positive treatment expectations predicted better contact both with the nursing and medical staff. Patients expecting less cure, less relief as well as less information and instructions are probably less motivated to interact with the staff which, in turn, may limit the perceived quality of contact.

There was an association between the patients' experience of contact with the medical staff and the degree to which the physicians considered the treatment as successful. It may be that physicians engage more easily with patients who can be helped medically, and thus improve the physician-patient contact. On the other hand, patients who recover more physically may tend to have better memories of the relationship with their physicians.

The positive change over time in the coronary patients' perception of their contact with the medical staff may again reflect that physicians had more post-operative contact with these patients than with the other diagnostic groups (Table 3). The association may also reflect that those who recover more over time (coronary patients) have better memories of the doctor-patient relationship than those belonging to other diagnostic groups.

As little of the variance in the contact dimensions could be explained by the patient-related factors, it is likely that much depends upon the characteristics of the staff, the treatment system and the situation. These aspects had not been the major focus of this study and certainly warrant more detailed investigation.

Several items in the contact measures were associated with the availability of time (Table 2) and their assessment probably reflected the patient load, the size of the staff, how the work was organized, the ward atmosphere, and the attitudes towards interpersonal and technical aspects of surgical care. Other items were specifically related to skills (Table 2). These aspects were probably more related to characteristics of the individual

staff member: their training and experience as well as their personality and interpersonal style. This also provides a possibility to improve the patients' contact with the treatment staff and should be explored further.

Factors influencing the provision of adequate treatment information (Table 8)

This factor was related to the characteristics of the patients, their illness, their life situation and treatment-related factors which together predicted one-third of the variance (Table 8).

Internal Health Locus of Control (self-mastery) and use of the coping strategy 'seeking support' are both associated with information-seeking activity and, not unexpectedly, predicted receiving adequate treatment information. The same was true of coronary illness presumably due to more thorough pre- and post-operative examinations and information than was associated with the other diagnostic groups (Table 3). The negative influence of the degree of chronicity of illness upon treatment information might indicate less contact seeking behavior among the more chronically ill and/or less treatment optimism among the treatment staff.

Compared with living alone, being married or cohabiting predicted better treatment information. The partner may provide informational support through discussions and clarifications of information/instructions the patient may have received during the hospital stay and of shared information – suggestions that the partner may make regarding ways the patient can cope with a variety of recovery tasks, and preparation for challenges in the home situation [27]. In the study of Ward *et al.* [28] involving cancer patients receiving chemotherapy, a positive correlation was found between the amount of communication and the patient's self-esteem in a situation where the patient and a significant other participated together. When only the patient received the information, there was an inverse correlation between communication and self-esteem.

The nature of the items comprising the information factor (Table 2) is of a specific character and requires individualized answers. This probably accounts for some of the association between treatment information and the quality of contact with the staff. The strong contribution made by contact with the nursing staff underline their importance well beyond that of caregivers. The contribution made by contact with the medical staff was much smaller. Some of the distinction may be due to differences in the amount of time spent with the nursing and medical staff during the hospital stay. Although we did not measure the amount of time spent with the nursing staff, the amount of time spent with the physicians was rather limited (Table 3). However, an expressed need for more physician time did not predict patients' reports of receiving less treatment information. Improved communication skills among physicians and more available time might improve their role as providers of information.

Patient perceptions about receiving adequate treatment information became more positive as time progressed. At the same time the association with the perceived quality of

contact with the nursing staff became less prominent. Probably this reflects more post-operative contact with physicians and limited contact with nurses in the follow-up period.

Conclusion

Patient satisfaction appears to be multifactorially determined and strongly influenced by the perceived quality of contact with the nursing and medical staff, thus underlining the importance with which patients viewed the interpersonal aspects of their care. Specific questions related to aspects of the patients' treatment experiences appear to be crucial in reflecting their reactions and allow for the retrospective investigation of treatment satisfaction.

Only a small part of the variance in the experienced quality of the contact with the nursing and medical staff could be accounted for. Almost all of this was related to the characteristics of the patients. The remaining variance is probably strongly related to the interpersonal skills of the staff and the treatment system. These need further study and could well contribute to improving the relationship of caregivers with their patients.

The experienced quality of contact with the nursing staff appeared as the major determinant of patients' reception of adequate information of their condition and its treatment. This emphasizes the importance the role the nursing staff play, not only as caregivers but also as providers of information, including highly relevant medical information. The degree to which this role is recognized and taken advantage of may vary considerably across surgical departments.

Acknowledgements

The study received financial support from the Norwegian Medical Association.

References

1. Hsieh Mei-O, Kagle JD. Understanding patient satisfaction and dissatisfaction with health care. *Health Soc Work* 1991; **16**: 281–290.
2. McMillian JR, Yonger MS, DeWine LC. Satisfaction with hospital emergency department care as a function of patient triage. *HCMR* 1986; **11**: 21–27.
3. Hall JA, Dornan MC. What patients like about their medical care and how often they are asked: a meta-analysis of the satisfaction literature. *Soc Sci Med* 1998; **27**: 935–939.
4. Kiyak HA, Vitaliano PP, Crinean J. Patients' expectations as predictors of orthognatic surgery outcomes. *Health Psychol* 1988; **7**: 251–268.
5. George J, Scott D, Turner S, Gregg J. The effects of psychological factors and physical trauma on recovery from oral surgery. *J Behav Med* 1980; **3**: 291–310.
6. George J, Scott D. The effect of psychological factors on recovery from surgery. *J Am Dent Assoc* 1982; **105**: 251–257.

7. Lunde IM. How patients views can be integrated into quality evaluation. *Nord Med* 1993; **108**: 121–123.
8. Barlett EE, Grayson M, Barker R *et al*. The effects of physician skills on patient satisfaction; recall and adherence. *J Chron Dis* 1984; **37**: 755–764.
9. Fitzpatric R. Surveys of patient satisfaction 1, Important general considerations. *Br Med J* 1991; **302**: 887–889.
10. Kane RL, Maciejewski M, Finch M. The relationship of patient satisfaction with care and clinical outcomes. *Med Care* 1997; **35**: 714–730.
11. Stewart MA. Effective physician-patient communication and health outcomes: a review. *Can Med Assoc J* 1995; **152**: 1423–1433.
12. Sørli, T, Sexton H, Sørli D. To what degree can satisfaction with hospital treatment be explained? *J Nor Med Assoc* 1997; **117**: 2637–2640.
13. Guldvåg B, Hofoss D, Pettersen KI, Ebbesen J, Rønning OM. The PS-RESKVA patient-satisfaction survey questionnaire. *J Nor Med Assoc* 1998; **118**: 386–391.
14. Fitzpatrick R. Surveys of patient satisfaction: important general considerations. *B Med J* 1991; **302**: 887–889.
15. Ware Jr JR, Sherbourne CD. The MOS 36-Item Short-Form Health Survey (SF-36) 1. Conceptual framework and item selection. *Med Care* 1992; **30**: 473–481.
16. Carp F, Carp A. Structural stability of well-being factors across age and gender, and development of scales of well-being unbiased for age and gender. *J Gerontol* 1983; **38**: 572–581.
17. Costa PT, McCrae RR. *The NEO Personality Inventory Manual*. Odessa, FL: Psychological Assessment Resources, 1985.
18. Costa PT, Metter EJ, McCrae RR. Personality stability and its contribution to aging. *J Geriatr Psychol* 1994; **27**: 41–59.
19. Levinson H. *Differentiating Among Internality, Powerful Others, and Chance*. New York: Academic Press, 1981.
20. Derogatis L, Melisaratos N. The brief symptom inventory: An introductory report. *Psychol Med* 1983; **13**: 595–605.
21. Allen JP, Litten RZ, Fertig JB, Barbor T. A review of research on the Alcohol Use Identification Test (AUDIT). *Alc Clin Exp Res* 1998; **21**: 613–619.
22. Sørensen T. The feeling and satisfaction of social support; life stress, and their impact on mental health. In Torgersen S, Abrahamson P, Sørensen T, eds, *Psychiatry at the Crossroads Between Social Science and Biology*. Norwegian University Press, 1991: pp. 32–43.
23. Bentsen H. *Felt Emotion Rating Scale*. Doctoral dissertation, University of Oslo, 1998.
24. SAS Institute Inc. Technical report P-229 SAS/STAT: *Software Changes and Enhancements*. Cary NC: SAS Institute Inc., 1992.
25. Aseltine HA, Carlson KJ, Fowler FJ, Barry MJ. Comparing prospective and retrospective measures of treatment outcomes. *Med Care* 1995; **33**: AS67–AS76.
26. Geerts E, Bouhuys N. Multi-level prediction of short term outcome of depression: non-verbal interpersonal processes, cognitions and personality traits. *Psychol Res* 1998; **41**: 59–72.
27. Cohen S, Hoberman HM. Positive events and social support in the etiology of physical disease. *Health Psychol* 1983; **13**: 99–125.
28. Ward S, Leventhal H, Easterling D *et al*. Social support, self-esteem, and communication in patients receiving chemotherapy. *J Psychosoc Oncol* 1991; **9**: 95–116.

Accepted for publication 15 October 1999