

Patient satisfaction in relation to age, health status and other background factors: a model for comparisons of care units

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Abstract

Objective. To analyse the relationship between patient satisfaction and background factors such as age, gender, health status and pain. In addition, to use background factors to create less biased ranking in comparisons of patient satisfaction between medical specialities.

Design. A questionnaire was sent by post to patients who had recently received inpatient care at a hospital within the County of Östergötland, Sweden. The questionnaire contained 33 questions, 21 of which concerned the quality of health care and patient satisfaction.

Setting. Inpatient departments at all four hospitals in the County of Östergötland, Sweden.

Subjects. All patients discharged from the hospital during a period of 6 weeks. Approximately 3400 patients aged 1–94 years responded to the questionnaire, resulting in a response rate of 69%.

Main outcome measures. Patient satisfaction index score (PSI).

Results. Of the background factors tested, patient age had the greatest explanatory value regarding the PSI, closely followed by experiencing anxiety during admission. With regard to variations in the PSI, about 20% could be explained by the background factors taken as a whole. Gender did not correlate with the PSI, although males were somewhat more satisfied than females. PSI scores differed among medical specialities and, interestingly, when age and other background factors were controlled for, the picture changed regarding the medical speciality that received the best PSI score.

Conclusion. The change in ranking among medical specialities after adjustment for background factors emphasizes the importance of including background factors in patient satisfaction analyses in order to obtain less biased comparisons.

Keywords: age, determinants, health, inpatient care, patient satisfaction, quality of health care

Quality of care from the patient's perspective is an important aspect in the development of health services. In Sweden, studies of patient satisfaction frequently comprise a vital part of the assessment of health care. In the County of Östergötland, the County Council has chosen to use the same instrument for all units within a particular form of health care. For inpatient hospital care, primary care and hospital outpatient care, instruments are used that are nearly identical. One of the aims of using the same instrument for all units within a particular form of health care is to enable comparisons between units within the same medical speciality. It should also be possible to perform rough comparisons of patient satisfaction and related dimensions between other units and even other health care forms. The growing database provided us with a great deal of interesting data, but we became aware of a bias in scores depending on patient age. This raised the

question of whether there were other background factors that could significantly influence patient satisfaction scores.

In 1994 over 1000 articles on 'patient satisfaction' were published in the medical and nursing literature [1]. Studies on patient satisfaction have been criticized for not reporting reliability and validity data [2]. In recent years, however, there has been an increase in the number of validated instruments [3]. It has been proposed that multiple sets of background factors are associated with patient scores on questions about health care [1]. If different health care units are to be compared, it will be necessary to collect additional background data along with the quality of care data.

Age is a well-known determinant of the Patient Satisfaction Index (PSI) with older patients scoring more highly and being more satisfied than young and middle-aged patients [4–6]. Some studies have also pointed out that health expectation

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is related to the outcome of patient satisfaction [7,8]. The extent to which a patient's health status correlates with patient satisfaction has also been investigated, but the results are inconsistent. Zapka *et al.* [9] found that healthier patients were more satisfied but also, on the contrary, that patients with chronic illness were more satisfied. Hsieh and Kagle [7] found that health status was not a strong predictor, although other studies reported that mental but not physical health status was significantly associated with patient satisfaction, and that poor health and pain decreased patient satisfaction [4,10,11]. Da Costa *et al.* [12] found that 'self-reported physical and mental health status and social support are more important than clinical status in understanding patient satisfaction'. Hall *et al.* [13] found in a longitudinal study that self-perceived overall health predicts the level of patient satisfaction.

When instruments for measuring patient satisfaction are used as tools for comparing health care units or for following time trends, dominant background factors should be controlled for in order to make comparisons reliable. If background factors are not controlled for, any significant results might be the effect of discrepancies in background factors due to different characteristics in the samples being studied.

The first objective of this study was to analyse the relationship between patient satisfaction and background factors such as age, gender and health status. The second objective was to evaluate the importance of background factors when ranking health care institutions on patient satisfaction.

Material and methods

The study comprised 3380 patients who had recently been admitted to hospital. A questionnaire was posted to all patients discharged from the hospital during a 6-week period in the autumn of 1998 within 2 months of discharge. The questionnaire contained 33 numbered questions, 21 of which directly concerned quality of care and patient satisfaction. The questionnaire was designed for adult patients. Where the identified patient was 16 years of age or younger, the parents were invited to assist with completion or complete the form on the patient's behalf. This request was made in the covering letter.

The questions addressing quality of care and patient satisfaction were constructed in line with the Quality Satisfaction and Performance (QSP) model, although we used a scale from one to seven instead of the original range of 1–10 [3]. The same dimensions of health care were utilized as in the original QSP study, but the dimensions were covered with fewer questions.

The overall response rate was 69%, with more females responding than males. There was a great variation in response rate according to age. From the group males aged 85–94, 34% responded to the questionnaire, while for females aged 55–64 years there was a response rate of 80% (Table 1). Parents were asked to report their child's gender and age. Five per cent of the parents accidentally reported their own

Table 1 Response rates by patients' age group and gender

Age group ¹	Female	Male
1–14	66.7	71.0
15–24	61.0	48.2
25–34	62.0	55.3
35–44	66.8	55.5
45–54	77.5	72.5
55–64	79.6	78.5
65–74	75.2	77.0
75–84	68.1	70.7
85–94	49.8	34.3
Total	68.3	69.3

¹ Where the identified patient was ≤ 16 years old, parents were invited to assist with completion of the form, or complete the form on the patient's behalf.

age and gender. In these cases information regarding the child's age and gender was collected from the medical records.

Patient satisfaction index

The PSI was constructed using two questions concerning overall evaluation of the admission period in the same manner as in the original QSP model [3]. Each question had answer alternatives in the range of 1–7, and the merging of the two questions resulted in a range of 2–14. This variable was used as the dependent variable in the following regression analysis. The two questions were:

- (i) How did you feel about the admission as a whole? (mean 6.0, SD 1.4);
- (ii) Imagine an admission that is perfect in every respect. How close or far away from this ideal do you think your last admission was? (mean 5.6, SD 1.5).

The first PSI question was at the beginning of the questionnaire and the second was located at the end. The Pearson's Product Moment correlation was 0.72 for the two questions constituting the PSI, which indicates a fairly good inter-reliability.

Statistical analysis

Multiple regression analysis was used in the comparison of medical specialities. Not all patients answered every question, and the resulting loss of respondents reduced the material to approximately 2800 patients in the regression solution. The exclusion method used in the regression analysis was pairwise deletion [14]. The b-coefficient presented in the analysis is the unstandardized regression coefficient of the variable.

Results

Scores on the PSI increased with age, and the highest mean was found in the age group 75–84 years. The distribution was not completely linear because the youngest age group

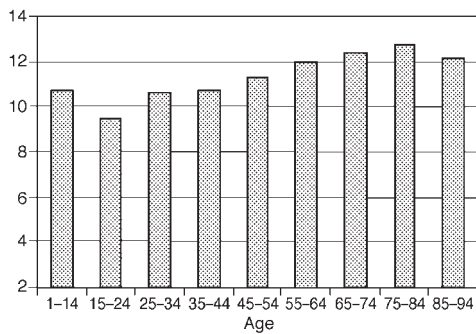


Figure 1 Mean distribution of patient satisfaction index scores across age groups.

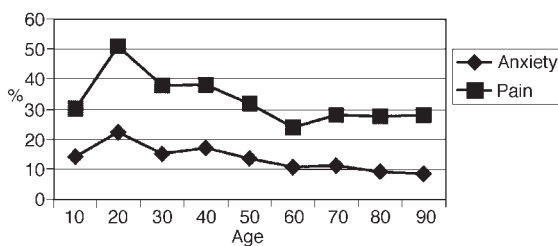


Figure 2 Percentage of patients with anxiety and pain during the admission across age groups.

had a higher score than the following age group. That children scored higher than the subsequent age group, 15–24 years, might result from their parents completing the questionnaires, but it could also indicate some positive differences related to the children's health care as compared with that received by young adults (Figure 1).

The groups with the highest PSI scores were also found to contain the greatest proportion of patients with poor health. For pain and anxiety, however, the distribution was negative compared with age with a peak in prevalence for the age group 15–24 years (Figure 2).

Regression analysis

A regression analysis was carried out to investigate any relationship between background factors and the PSI. The variables in Table 2 were used in the regression analysis.

Many significant correlations were found between the variables, and the PSI correlated significantly with all variables. 'Health', 'Anxiety' and 'Pain' were significantly correlated with each other and with age. 'Anxiety' and 'Age' had the highest correlation to the PSI (over 0.3). It should be noted that even moderate correlations can be significant due to the large sample size (Table 3).

The regression solution explains 19% of the variance in the PSI. Patient age was the greatest explanatory factor with respect to the PSI, closely followed by anxiety during the admission. When anxiety increased, the PSI value decreased. Overall health status and the presence of pain during the admission were also significantly related to the PSI. The PSI value decreased when pain increased and health status moved toward ill health (Table 4).

Gender did not correlate with the PSI, nor did the number of visits for outpatient care or the information variable.

The second step was to compare different clinical specialities while at the same time adjusting for background factors in a regression solution. The aim was to see if there were any differences in the PSI between the specialities. Six different specialities were identified in the material and the PSI mean for each speciality revealed distinct differences (Table 5). Each speciality consisted of two or three departments in the four hospitals in the study, so that each speciality thereby consisted of at least two independent health care units. A large number of patients were not classified into specialities ($n = 1408$). The oldest patients were in Internal Medicine and Surgery. In the unadjusted analysis the best overall health status was found among patients in Paediatrics and Gynaecology, while the lowest pain scores were found among patients in Psychiatry and Internal Medicine. As expected, 'Anxiety' was most frequent among patients in Psychiatry, but a high score for 'Anxiety' was also found in Paediatrics (Table 5). The lowest means for the PSI were found in Psychiatry and Paediatrics, while the other four specialities had means in the range 11.6–11.8.

After controlling for background factors there was a large change in the PSI mean for Paediatrics, while for the other specialities it remained quite stable. For three specialities the mean became higher, with a remarkable increase for Paediatrics. The means for three specialities were slightly lower than before the adjustment. The adjusted mean for each speciality gives the 'standardized' PSI value in a situation when the background factors are of the same importance for each speciality. In other words there is no bias from the background factors used regarding the PSI mean for each speciality.

Discussion

As has been reported in several previous studies, these results indicate that age is one of the most important background factors for explaining variations in the PSI. The patient's subjective health status is also significantly related to the PSI, especially mental health status in the form of anxiety. Overall health is significant to a lesser extent. This is in line with previous studies, such as that of Cohen [4] who found a weak relationship between satisfaction and physical functioning but a strong relationship between satisfaction and mental health and pain. What is it then that makes the 'ill' patient less satisfied? Hall *et al.* [13] studied the causal relationship between health and patient satisfaction and found 'strong evidence that health status is a causal determinant of satisfaction', but did not exclude the possibility that the physician could mediate the effects of satisfaction. In another study, when physicians rated how much they liked individual patients, 'there was a significant relation between these liking ratings and the patients' physical and mental health status; sicker and less emotionally adjusted patients were liked less' [15]. This may suggest that the physician may prefer healthy patients.

Females did not have a more positive attitude than males

Table 2 Variables in the regression analysis

Variable	Range and label	Mean	SD
Age	1–95 years; 1-year intervals	55.3	22.7
Sex	1–2, male = 1 female = 2.	1.5	0.5
Visits	0, 1, 2, 3, 4, 5; 0 = no visit in outpatient care, 1 = one visit, 2 = two visits . . . 5 = ≥ five outpatient visits	2.9	1.5
Information	0–1, 0 = the patient has not obtained additional information about their present disease/problem on their own 1 = the patient has obtained additional information about their present disease/problem on their own	0.6	0.5
Health	1, 2, 3, 4; ordinal scale. 1 = has ‘excellent health’, 2 = has fairly ‘good health’, 3 = ‘is quite ill’ and 4 = ‘is very ill’	2.1	0.7
Pain	1, 2, 3, 4, 5, 6 and 7; ordinal scale. 1 = ‘had no pain’, 7 = ‘had severe pain during the admission’	4.1	2.1
Anxiety	1, 2, 3, 4, 5, 6 and 7; ordinal scale. 1 = ‘had no anxiety’, 7 = ‘had severe anxiety during the admission’	2.7	2.0
PSI	2, 3, 4 . . . 14; ordinal scale. 2 = no satisfaction, 14 = highest satisfaction	11.7	2.7

PSI, patient satisfaction index.

Table 3 Pearson Product Moment correlation coefficients are shown below the diagonal and levels of significance above the diagonal

Correlation/ Significance	Age	Anxiety	Health	Pain	Info	Visits	Sex	PSI
Age	1	0.000	0.000	0.000	0.494	0.366	0.003	0.000
Anxiety	–0.167	1	0.000	0.000	0.000	0.000	0.000	0.000
Health	0.337	0.211	1	0.000	0.000	0.000	0.891	0.000
Pain	–0.117	0.234	0.135	1	0.637	0.000	0.000	0.000
Info	0.013	0.106	0.136	0.009	1	0.000	0.253	0.020
Visits	0.018	0.135	0.288	0.091	0.100	1	0.006	0.006
Sex	0.055	–0.073	0.003	–0.111	–0.021	0.053	1	0.009
PSI	0.307	–0.323	–0.087	–0.182	–0.044	–0.054	0.049	1

PSI, patient satisfaction index.

Table 4 Regression analysis of the patient satisfaction index in relation to the background factors

	b-coefficient	t-value	Significance
(Constant)	11.711	48.3	0.000
Age	0.037	16.2	0.000
Anxiety	–0.309	–12.4	0.000
Health	–0.504	–6.8	0.000
Pain	–0.085	–3.8	0.000
Info	–0.109	–1.1	0.252
Visits	0.025	0.8	0.440
Sex	0.069	0.7	0.464
Adjusted R2 = 0.19			
n = 2779			

according to the PSI, but gynaecology as a speciality had more satisfied patients than average. One may speculate that patient integrity and discussions with the patient are of a more sensitive nature in gynaecology compared with other specialities, and that this might result in a more satisfied patient. Paediatrics initially had one of the lowest PSI mean scores, but after adjustment it was found that these were the most satisfied patients in the whole sample. One possibility could be that children are the focus of more concern from doctors and other personnel during an admission, with the aim of providing support and making the admission less traumatic. This extra concern could result in higher ratings than average when age and other background factors are controlled for. However, the use of the child’s age in the regression solution could be questioned. The parents are advocates for their children, and if the parents’ ages were used, the PSI mean for this group would fit better in the sequence of mean scores represented by the bars in Figure 1. If Paediatrics was given the overall age

Table 5 PSI and means¹ of selected background factors by speciality

Speciality	PSI mean	Age	Health	Pain	Anxiety	PSI-mean adjusted ²
Gynaecology	11.8	40.9	1.6	4.5	2.8	12.2
Surgery	11.7	61.4	2.1	4.6	2.4	11.4
Orthopaedics	11.6	58.9	2.2	5.1	2.2	11.4
Internal medicine	11.6	66.8	2.3	3.8	2.8	11.2
Paediatrics	10.6	9.5	1.6	4.4	3.1	12.4
Psychiatry	9.1	45.3	2.3	3.0	5.8	10.5
Total average, including patients not classified according to speciality	11.7	55.3	2.1	4.1	2.7	

¹ A low value indicates feeling healthier, less pain and less anxiety than a high value. ² The calculations for obtaining adjusted PSI means are presented in the Appendix.

of 30 years, the PSI mean would only increase from 10.6 to 11.5, instead of to 12.4.

The fact that Psychiatry had less satisfied patients than average is probably not surprising. Both in this study and in others, mental health status has been found to be correlated with the PSI, and in Psychiatry the condition or problem directly relates to mental health. No change in relation to the other specialities occurred for Psychiatry after adjustment.

The model for comparing specialities in this paper can serve as a general guide. Comparisons can be less biased only when important background factors are controlled for, and information about those background factors must therefore be collected simultaneously, even for comparisons over time within one unit. This was suggested by Rosencheck *et al.* [16] who stated that 'Accurate comparison of patient satisfaction between facilities requires that adjustments be made for differences in patient characteristics.' Rosencheck *et al.* [16] confirmed that age and health status are important factors (in mental health services) but they also indicated that the length of stay can be a predictor of patient satisfaction, where a longer length of stay is associated with greater satisfaction.

There may be more relevant background factors than those mentioned and used in this study. For instance, social class and/or educational level may be of further explanatory value regarding the variation in the regression model. That educational level may influence patient satisfaction is supported by the findings of Hall and Dornan [17], who concluded after a meta-analysis that greater satisfaction is associated with less education. Even more complex sets of health-related behaviours can be determinants of patient satisfaction and can be useful in any analysis. For instance, Weiss [18] found in a sample of 400 persons that 'confidence in the community's medical care system, having a regular source of care, and being satisfied with life in general' were more important predictors of patient satisfaction than age, gender, race, educational attainment and income.

We have chosen a global measure of patient satisfaction. In a previous study of this material the other questions constituted the following dimensions: (i) 'the Physician', with questions about personal treatment, confidence, amount of

time in consulting the doctor during the admission etc; (ii) 'Other staff members and service', with questions about personal treatment, confidence, quality of food etc. and (iii) 'Participation' with two questions about the patients participation in decision making and medical treatment. These three dimensions were extracted in a factor analysis based on 15 questions in the questionnaire [19].

The global measure of patient satisfaction that is used correlates strongly with most of the other 19 quality of care questions. For instance, a previous analysis of the same material showed that 16 of these items from the questionnaire corresponded to 98% of the explained variance of PSI in the form of R² within a regression analysis [19]. Although in many cases the correlations are high between the global measure and the partial dimensions, we do not know whether the same ranking of specialities would be the case in all instances. Furthermore, the methodological problems addressed in this paper, i.e. the influence of background factors, may vary between specific dimensions.

Medical results after a visit or admission would probably be highly correlated with the PSI, but medical results could also be seen as a factor in building up patient satisfaction, and as such they do not qualify as a true background factor. Health expectation, however, is a factor that may be closely related to the PSI and that could be entered into the model.

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References

1. Sitzia J, Wood N. Patient satisfaction: a review of issues and concepts. *Soc Sci Med* 1997; **45**: 1829–1843.
2. Sitzia J. How valid and reliable are patient satisfaction data? An analysis of 195 studies. *Int J Qual Health Care* 1999; **11**: 319–328.

3. The Swedish planning and Rationalisation Institute of the Health and Social Services. Report 492. How can we measure patient satisfaction? A comparison of the methods Quality Satisfaction Performance, QSP and Quality from the patient perspective (in Swedish). Stockholm 1999.
4. Cohen G. Age and health status in a patient satisfaction survey. *Soc Sci Med* 1996; **42**: 1085–1093.
5. Wilde B, Larsson G, Larsson M, Starrin B. The patient evaluates health care (in Swedish). FoU Report 45. The Care Federation, 1995.
6. Pope CR, Russell AA. Measuring patient satisfaction: a post-visit survey vs a general membership survey. *HMO Pract* 1997; **11**: 74–79.
7. Hsieh MO, Kagle JD. Understanding patient satisfaction and dissatisfaction with health care. *Health Soc Work* 1991; **16**: 282–290.
8. Linder-Pelz S. Social psychological determinants of patients' satisfaction: a test of five hypothesis. *Soc Sci Med* 1982; **16**: 583–589.
9. Zapka JG, Palmer RH, Hargraves JL *et al*. Relationships of patient satisfaction with experience of system performance and health status. *J Ambulatory Care Management* 1995; **18**: 78–83.
10. Marshall GN, Hays RD, Mazel R. Health status and satisfaction with health care: results from the medical outcomes study. *J Consult Clin Psychol* 1996; **64**: 380–390.
11. Johnsson JA, Coons SJ, Hays RD, Pickard AS. Health status and satisfaction with pharmacy services. *Am J Management Care* 1999; **5**: 163–170.
12. Da Costa D, Clarke AE, Dobkin PL *et al*. The relationship between health status, social support and satisfaction with medical care among patients with systemic lupus erythematosus. *Int J Qual Health Care* 1999; **11**: 201–207.
13. Hall JA, Milburn MA, Epstein AM. A causal model of health status and satisfaction with medical care. *Med Care* 1993; **31**: 84–94.
14. *SPSSx. User's Guide* 2nd edn. Michigan: McGraw Hill, 1986.
15. Hall JA, Epstein AM, DeCiantis ML, McNeil BJ. Physicians' liking for their patients: further evidence for the role of effect in medical care. *Health Psychol* 1993; **12**: 140–146.
16. Rosencheck R, Wilsson NJ, Meterko M. Influence of patient and hospital factors on consumer satisfaction with inpatient mental health treatment. *Psychiatr Serv* 1997; **48**: 1553–1561.
17. Hall JA, Dornan MC. Patient sociodemographic characteristics as predictors of satisfaction with medical care: a meta-analysis. *Soc Sci Med* 1990; **30**: 811–818.
18. Weiss GL. Patient satisfaction with primary medical care. Evaluation of sociodemographic and predispositional factors. *Med Care* 1998; **26**: 383–392.

19. Rahmqvist M, Johansson G. Patient satisfaction in out- and inpatient care in The County of Östergötland (in Swedish). Linköping University, 1999. CMT Report 1999: 1.

Appendix. Adjustment for background factors

The adjusted PSI mean for each speciality was obtained by using the results from the regression analysis. The adjusted PSI mean is the expected PSI value if each speciality had the same age, health, pain and anxiety score as seen in Tables 2 and 5. To obtain the adjusted PSI mean the following formula was used:

$$\text{Adjusted PSI} = \text{constant} + (\text{b-coefficient AGE} * \text{mean AGE}) + (\text{b-coefficient Anxiety} * \text{mean Anxiety}) + (\text{b-coefficient Health} * \text{mean Health}) + (\text{b-coefficient Pain} * \text{mean Pain})$$

The values that are used are presented in Appendix Table 1.

Adjusted PSI means for all categories:

$$11.413 + (0.043 \times 55.3) + (-0.292 \times 2.7) + (-0.437 \times 2.1) + (-0.093 \times 4.1) = 11.704$$

Example of an adjusted mean:

$$\text{for Surgery: } 11.7 - 0.317 = 11.4$$

$$\text{for Paediatrics: } 11.7 + 0.696 = 12.4$$

Appendix Table 1 Regression analysis of the Patient Satisfaction Index (PSI) in relation to medical speciality¹ and background factors

	b-coefficient	t-value	Significance
(Constant)	11.413		
Age	0.043	16.7	0.000
Anxiety	-0.292	-11.7	0.000
Health	-0.437	-6.1	0.000
Pain	-0.093	-4.1	0.000
Paediatrics ^c	0.696	2.9	0.004
Gynaecology ^c	0.499	2.8	0.005
Orthopaedic ^c	-0.327	-1.9	0.056
Surgery ^c	-0.317	-2.2	0.028
Psychiatry ^c	-1.247	-3.7	0.000
Internal medicine ^c	-0.541	-4.1	0.000
	<i>n</i> = 2867		

⁴The superscript 'c' indicates that the medical speciality is compared with the group of patients not classified according to speciality. That group has a total number *n* = 1408.