Patient Satisfaction after Pulmonary Resection for Lung Cancer: A Multicenter Comparative Analysis

Cecilia Pompili[a]   Alessandro Brunelli[a]   Gaetano Rocco[b]   Rosario Salvi[b]
Francesco Xiumé[a]   Antonello La Rocca[b]   Armando Sabbatini[a]   Nicola Martucci[b]

Divisions of Thoracic Surgery, [a]Ospedali Riuniti, Ancona, and [b]National Cancer Center, Pascale Foundation, Naples, Italy

Abstract

Background: Patient satisfaction reflects the perception of the customer about the level of quality of care received during the episode of hospitalization. *Objective:* To compare the levels of satisfaction of patients submitted to lung resection in two different thoracic surgical units. *Methods:* Prospective analysis of 280 consecutive patients submitted to pulmonary resection for neoplastic disease in two centers (center A: 139 patients; center B: 141 patients; 2009–2010). Patients' satisfaction was assessed at discharge through the EORTC-InPatSat32 module, a 32-item, multi-scale self-administered anonymous questionnaire. Each scale (ranging from 0 to 100 in score) was compared between the two units. Multivariable regression and bootstrap were used to verify factors associated with the patients' general satisfaction (dependent variable). *Results:* Patients from unit B reported a higher general satisfaction (91.5 vs. 88.3, p = 0.04), mainly due to a significantly higher satisfaction in the doctor-related scales (doctors' technical skill: p = 0.001; doctors' interpersonal skill: p = 0.008; doctors' availability: p = 0.005, and doctors information provision: p = 0.0006). Multivariable regression analysis and bootstrap confirmed that level of care in unit B (p = 0.006, bootstrap frequency 60%) along with lower level of education of the patient population (p = 0.02, bootstrap frequency 62%) were independent factors associated with a higher general patient satisfaction. *Conclusion:* We were able to show a different level of patient satisfaction in patients operated on in two different thoracic surgery units. A reduced level of patient satisfaction may trigger changes in the management policy of individual units in order to meet patients' expectations and improve organizational efficiency.

Copyright © 2012 S. Karger AG, Basel

Introduction

Patient satisfaction reflects the perception of the customer about the level of quality of care received during the episode of hospitalization. It is a model of non-clinical indicators of performance, which is not necessarily correlated with more common clinical outcomes [1] and aimed mainly at identifying which aspects of a service need to be changed to improve patient satisfaction [2].

Dr. Alessandro Brunelli
Division of Thoracic Surgery, Ospedali Riuniti Ancona
Via Conca 71
IT–60127 Ancona (Italy)
Tel. +39 071 596 4433, E-Mail brunellialex @ gmail.com

In order to comply with cost containment policies, managed healthcare is increasingly implementing marketing strategies. In this context, the concept of customer relationship management, aimed at finding and attracting new clients, retaining those the company already has, and reducing the costs of marketing and client service, is becoming an integral part of the healthcare industry.

Customer relationship management needs to be evaluated with specific instruments to complement clinical assessment and possibly drive strategies to improve organizational efficiency [3]. Hence, the objective of this prospective investigation was to test the feasibility of a comparative application of a validated instrument (EORTC-InPatSat32 module) to assess the levels of satisfaction perceived by patients operated on in two different thoracic surgical units and to put them in the context of their structural and organizational characteristics.

Patients and Methods

A total of 280 consecutive patients discharged from the hospital following pulmonary resection for neoplastic disease at two centers (center A: 139 patients; center B: 141 patients; 2009–2010) were included in this prospective study. Patients submitted to pulmonary resection for non-neoplastic diseases or other types of thoracic procedures were excluded from the analysis. Likewise, those unable to collaborate and complete the questionnaire (for psychiatric disease or refusal to participate) were not included (3 in each center). The patients enrolled in this study reflect the population generally operated on in the two centers. Operative selection criteria were standardized [4, 5]. The two general thoracic surgical units are located in tertiary referral centers and are staffed by board-certified general thoracic surgeons and dedicated personnel (i.e. nurses and chest physiotherapists). All operations were performed or supervised by board-certified general thoracic surgeons. In fact, although the two units have similar standardized perioperative pathways of care, their structural characteristics differed. In unit A, the staff surgeons met patients during preoperative counseling and briefly during morning and evening rounds. Thereafter, surgical candidates were mainly cared for by fellows/trainees. On the other hand, in unit B, patients were exclusively managed by staff surgeons (unit B).

In addition, in unit B, the entire preoperative workup was carried out in the general thoracic surgical unit during the same period of hospitalization before surgical treatment took place and this resulted in a longer hospital stay.

In both units, patients were generally extubated in the operating room and admitted to the dedicated thoracic surgery ward or intensive care unit depending on the final evaluation by the anesthesiologist. Indeed, advanced care management was reserved only for patients with severe cardiopulmonary complications needing active life support measures.

Table 1. The EORTC-InPatSat32 multi- and single-item scales of the questionnaire

Doctors	Nurses	Other hospital personnel
Multi-item scales		
Interpersonal skills	Interpersonal skills	Kindness and helpfulness, and information giving
Technical skills	Technical skills	Waiting time (performing medical tests/treatment, receiving medical tests results)
Information provision	Information provision	Access
Availability	Availability	
Single-item scales		
Exchange of information		
Comfort/cleanness		
General satisfaction		

Assessment of Patient Satisfaction
After obtaining informed consent, patient satisfaction was assessed through the administration of the EORTC-InPatSat32 module [6] on the day of hospital discharge. Patients were asked to anonymously complete the questionnaire, seal it in an unmarked envelope and drop it into an appropriate box upon leaving the hospital.

During the same study period, 3 patients in unit A and 4 in unit B died in hospital and were not available for the survey. Other patients dropped out owing to refusal, logistic reasons and altered cognitive status (5 in unit A and 4 in unit B). Anonymity was chosen to minimize the social desirability bias [7]. This study was approved by the institutional review board of each hospital. The questionnaire is a 32-item self-administered survey including different scales reflecting the perceived level of satisfaction in relation to the care provided by doctors, nurses and other personnel during hospitalization [6] (table 1). The EORTC-InPatSat32 module has been validated previously [6].

Each aspect of care (scales) was rated according to a 5-level Likert response scale: from 'poor' to 'excellent'.

The 11 multi-item and 3 single-item scales are constructed in a similar manner: (1) the raw scores for the individual items within a scale are first summed, and then, for the multi-item scales, divided by the number of items in the scale, and (2) these scale scores are then linearly transformed such that all scales range from 0 to 100, with a higher scale score representing a higher level of satisfaction with care [6].

Statistical Analyses
Normal distribution of numeric variables was assessed by the Shapiro-Wilk normality test. The average scores of the different scales and other patient characteristics were compared between the two units using the unpaired Student t test in case of numeric variables with normal distribution, the Mann-Whitney test in

Table 2. Characteristics of the patients (n) in the two units

Variable	Unit A (n = 139)	Unit B (n = 141)	p value
Age >65 years	62 (45%)	50 (35%)	0.1
Female gender	38 (27%)	67 (48%)	0.0005
Graduate/postgraduate education	9 (6.5%)	24 (17%)	0.009
Hospital stay >15 days	5 (3.6%)	41 (29%)	<0.0001

Table 3. Comparison of different scales of patient satisfaction between the two units (means ± SD)

Variables	Unit A (n = 139)	Unit B (n = 141)	p value
Doctors			
Technical skill	85.6 ± 16	91.6 ± 11	0.001
Interpersonal skills	86.2 ± 17	90.8 ± 12	0.02
Information provision	82 ± 17	88.3 ± 13	0.001
Availability	84 ± 17	89 ± 13	0.015
Nurses			
Technical skill	86.3 ± 14	87.9 ± 13	0.2
Interpersonal skill	81.2 ± 16	83.7 ± 15	0.2
Information provision	85.5 ± 14	86.6 ± 13	0.5
Availability	85.3 ± 13	88.4 ± 14	0.1
Exchange of information	83.9 ± 16	85.7 ± 16	0.3
Other hospital personnel			
Kindness and helpfulness	83 ± 14	86 ± 14	0.08
Waiting time	81 ± 17	85.2 ± 16	0.04
Access	67.6 ± 22	71.3 ± 24	0.2
Comfort/cleanness	84.3 ± 17	87.2 ± 16	0.2
General satisfaction	88.3 ± 15	91.5 ± 13	0.04

Table 4. Results of multivariate regression analysis (dependent variable: patients' general satisfaction)

Variables	Coefficients	SE	p value	Bootstrap
Unit A	−5.01	1.8	0.006	78%
Higher level of education	−5.96	2.6	0.02	61%
Male gender	1.3	1.8	0.5	11%
Age >65 years	2.4	1.7	0.2	32%
Length of stay >15 days	−2.7	2.3	0.3	25%

Higher level of education: graduate or postgraduate; bootstrap frequency: percentage of cases variable turned out significant (p < 0.05) in 1,000 bootstrapped samples.

case of numeric variables without normal distribution or the χ^2 test in case of categorical variables. The following variables were then tested through a multivariable regression analysis for a possible association with general satisfaction: the unit in which the patient was operated on, gender, age, level of education and length of hospital stay. The results of the regression were then validated by bootstrap technique with 1,000 samples [8]. In the bootstrap procedure, repeated samples of the same number of observations (280) as the original database were selected with replacement from the original set of observations. For each sample, multivariable regression was performed. The stability of the final model was assessed by identifying the variables that entered most frequently in the repeated bootstrap models and comparing those variables with the variables in the final model. If the final model variables occured in a majority (50%) of the bootstrap models, the original final regression model was judged to be stable. All tests were two-tailed with a significance level of 0.05 and were performed on Stata 9.0 statistical software (Stata, College Station, Tex., USA).

Results

The characteristics of the patients collected in the anonymous surveys are shown in table 2. Compared to unit A, unit B had a higher proportion of females (48 vs. 27%, p = 0.0005), a lower proportion of patients >65 years of age (35 vs. 45%, p = 0.1), a higher level of education (graduate or postgraduate, 17 vs. 6.5%, p = 0.009) and more patients staying in the hospital >15 days (29 vs. 3.6%, p < 0.0001).

The overall patient satisfaction in the entire series was 89.9 (SD 13). Compared to patients in unit A, however, those in unit B reported a higher general satisfaction (91.5 vs. 88.3, p = 0.04). This difference was mainly due to a significantly higher satisfaction in the doctor-related scales (doctors' technical skill: p = 0.001; doctors' interpersonal skill: p = 0.008; doctors' availability: p = 0.005, and doctors' information provision: p = 0.0006) and waiting time (p = 0.04). No significant differences were evident in the other scales (table 3).

Multivariable regression analysis and bootstrap confirmed that being operated in unit B (p = 0.006) together with a lower level of education (p = 0.02) were independent factors associated with a higher general patient satisfaction adjusted for age, length of hospital stay and gender (table 4).

Discussion

In a marketing-oriented organization, the relationship between healthcare providers and their patients need to be taken into account in order to devise future strategies of resource allocation or redistribution. The viewpoint of

Pompili/Brunelli/Rocco/Salvi/Xiumé/La Rocca/Sabbatini/Martucci

Table 5. Influence of gender on doctor-related scales of patient satisfaction in the two centers (means ± SD)

Variables	Males			Females		
	unit A	unit B	p value	unit A	unit B	p value
Doctors' technical skill	86.7 ± 13.7	92.1 ± 11.7	0.007	84.7 ± 17.1	91.1 ± 10.3	0.02
Doctors' interpersonal skills	87.3 ± 14.8	90 ± 12.8	0.2	85.4 ± 16.1	91.7 ± 11	0.02
Doctors' information provision	83.3 ± 14.3	87.7 ± 13.8	0.04	80.7 ± 17.7	88.9 ± 12.6	0.007
Doctors' availability	84.2 ± 16.7	88.4 ± 13.5	0.07	83.4 ± 16.8	89.7 ± 12.4	0.03

the customer is gaining increasing importance in the evaluation of the efficacy of medical treatments and may complement clinical indicators of performance to drive decisions to attract more clients and increase revenues. Patients' quality perceptions in fact have been shown to account for 17–27% variation in a hospital's financial measures [9]. For this reason, marketing research strategies have been recently introduced in our specialty to study patient satisfaction [3].

Traditionally, healthcare quality evaluation has been based on provider-oriented clinical criteria [10]. Recently, clinical risk models have been proposed to compare the performance of thoracic surgery units [11] with the main aim at improving the standards of care. Internal verification processes on quality, however, are not evident to patients.

Most recently, however, there is increasing awareness of the importance of patient-reported outcomes and patient-centered type of care, which may take into account the individuals' psychosocial context and the analysis of more subjective endpoints. Investigating the patients' point of view regarding their overall healthcare experience represents an important form of participation [12] and information for designing and managing healthcare [13].

This concept is so relevant that in the US the Centers for Medicare and Medicaid Services together with the Agency for Healthcare Research and Quality have developed standardized patient satisfaction metrics, the Hospital Consumer Assessment of Healthcare Providers and Systems survey, to enable meaningful comparisons between hospitals on domains that are important to patients and public reporting to enhance public accountability in health care.

The objective of this investigation was to compare the levels of satisfaction perceived by patients operated on in two different thoracic surgical units during the same period by using the EORTC-InPatSat32 module. The main intent of this comparative analysis was to identify differences between the units that may trigger more in-depth structural analyses within each center with the intent to generalize and cross-validate positive aspects of care.

Although the two units were comparable in terms of clinical and surgical management and followed similar standardized perioperative pathways of care, we found a higher general satisfaction in patients managed in unit B compared to those managed in unit A.

In particular, this difference was due to significantly higher scores in the doctor-related scales. This difference may be at least partially explained by a different structural organization of the two units. Patients from unit B were managed by staff physicians, who were more constantly present in the ward compared to those in unit A. In fact, in unit A, the staff surgeons met patients during preoperative counseling and briefly during morning and evening rounds. Thereafter, surgical candidates were mainly cared for by fellows/trainees. This finding is in line with a previous study showing that patients cared by resident physicians were less satisfied than those cared by attending physicians, especially with regard to the doctors' personal manners and approach toward the patient [14].

As a consequence of these findings, unit A has decided to implement a policy of more intensive presence of staff physicians in the ward and an increased proportion of time spent by doctors visiting and interviewing the patients (assessment of this change in policy will be the object of a future investigation).

In addition, we found that a lower level of education was associated with a higher satisfaction with care. This finding confirmed previous contributions, which demonstrated that, as a rule, highly educated people are less satisfied with their healthcare services compared to their counterparts [15–17], even though they may report a better quality of life [18].

Previous studies have found that gender may influence patient satisfaction with care [19, 20]. Although we were

not able to find a significant association between general satisfaction and gender in the multivariable analysis, it should be noticed that unit B had a much higher prevalence of female patients compared to unit A. Since female patients have generally been described as more demanding and less content with all aspects of care than male patients [19, 20], one could indeed speculate that if both centers in this study would have had similar ratios of female/male patients, a much stronger satisfaction difference could have been expected to the benefit of center B.

The influence of gender on the doctor-related scales, which influenced most of the general satisfaction of patients with care, is shown in table 5. Unit B had higher scores in most of the scales in both genders.

Limitations

Some limitations and caveats need to be addressed:

We chose to administer the questionnaires anonymously with the intent to reduce social desirability bias [6]. However, this prevented us to collect important clinical information about patient characteristics and the episode of care (i.e. pulmonary function, performance status, type of operation, postoperative pain level, prior induction treatment, complications or preoperative quality of life), which may have been useful to analyze in relation to the level of satisfaction.

Previous studies have shown that the gender of physicians or nurses administering the questionnaire can influence the perception of care. In particular, this may concern aspects such as technical skills and interpersonal skills, which are generally perceived more important for women than for men [21]. However, the anonymous self-administration of the questionnaire prevented this type of bias.

The questionnaire was administered on the day of discharge from hospital in order to maximize response rate [22] and to allow for a better distinction among elements of satisfaction and higher response variability, as shown by others [23]. The measurement was done at one time point only; thus, evolution over time could not be evaluated.

Patients are in no position to assess the technical quality of the process of care [24, 25], and their judgment is primarily based on the interpersonal aspect of care that they receive and the manner in which medical care is delivered. For instance, the doctors' technical skill scale is not specifically related to the quality of the surgical act and rather reflects the patient perception of the doctors' knowledge and experience of his illness, the quality of global treatment he provided and the attention paid to the patients' physical problem.

The importance of the information provided by the patients on their perceived level of quality in the context of more objective clinical performance indicators need to be verified in future analyses before they can be reliably used to implement organizational changes and resource allocation [26]. However, in our opinion, subjective and objective measures of performance should remain independent until reliable adjusting and weighing methods will be developed.

Conclusion

We were able to show that the EORTC-InPatsat32 module can be used to assess the level of satisfaction with care after pulmonary resection for cancer. This instrument was able to detect different levels of patient satisfaction in patients operated on in two different thoracic surgery units. This type of analysis may have organizational implications inasmuch as a reduced level of patient satisfaction may warrant changes in the management policy of individual units or departments in order to alter their standards of care to meet patients' expectations. For instance, it has previously been shown that it is possible to improve patient satisfaction by modifying staff behavior [27]. Understanding the content and organization of patients' expectations can in fact allow any healthcare provider to respond proactively.

As already done in other marketing sectors, even in our setting, future investigations aimed at implementing personalized plans of multidimensional care appear appropriate [3, 28].

References

1 Brunelli A, Rocco G: Clinical and nonclinical indicators of performance in thoracic surgery. Thorac Surg Clin 2007;17:369–377.

2 Jackson J, Chamberlin J, Kroenke K: Predictors of patient satisfaction. Soc Sci Med 2001; 52:609–620.

3 Rocco G, Lauro C, Lauro N, Sarnelli M, Olivieri G, Gatti S, La Rocca A, La Manna C: Partial least squares path modelling for the evaluation of patients' satisfaction after thoracic surgical procedures. Eur J Cardiothorac Surg 2009;35:353–357.

4 Brunelli A: Algorithm for functional evaluation of lung resection candidates: time for reappraisal? Respiration 2009;78:117–118.

5 Bolliger CT: Functional reserve before lung resection: how low can we go? Respiration 2009;78:20–22.

6 Brédart A, Bottomley A, Blazeby JM, Conroy T, Coens C, D'Haese S, Chie WC, Hammerlid E, Arraras JI, Efficace F, Rodary C, Schraub S, Costantini M, Costantini A, Joly F, Sezer O, Razavi D, Mehlitz M, Bielska-Lasota M, Aaronson NK, European Organisation for Research and Treatment of Cancer Quality of Life Group and Quality of Life Unit: An international prospective study of the EORTC cancer in-patient satisfaction with care measure (EORTC IN-PATSAT32). Eur J Cancer 2005;41:2120–2131.

7 Philips DL, Clancy KJ: Some effects of social desirability in survey studies. Am J Sociol 1972;77:921–938.

8 Blackstone EH: Comparing apples and oranges. J Thorac Cardiovasc Surg 2002;123:8–15.

9 Alrubaiee L, Alka'idaa F: The mediating effect of patient satisfaction in the patients' perceptions of healthcare quality-patient trust relationship. Int J Marketing Studies 2011;3:103–127.

10 Donabedian A: Evaluating quality of medical care. Milbank Q 1996;44:166–206.

11 Brunelli A, Rocco G: The comparison of performance between thoracic surgical units. Thorac Surg Clin 2007;17:413–424.

12 Arora NK: Importance of patient-centered care in enhancing patient well-being: a cancer survivor's perspective. Qual Life Res 2009;18:1–4.

13 Naidu A: Factors affecting patient satisfaction and healthcare quality. Int J Health Care Qual Assur 2009;22:366–381.

14 Yancy WS Jr, Macpherson DS, Hanusa BH, Switzer GE, Arnold RM, Buranosky RA, Kapoor WN: Patient satisfaction in resident and attending ambulatory care clinics. J Gen Intern Med 2001;16:755–762.

15 Sun BC, Adams J, Orav EJ, Rucker DW, Brennan TA, Burstin HR: Determinants of patient satisfaction and willingness to return with emergency care. Ann Emerg Med 2000;35:426–434.

16 Quintana JM, González N, Bilbao A, Aizpuru F, Escobar A, Esteban C, San-Sebastián JA, de-la-Sierra E, Thompson A: Predictors of patient satisfaction with hospital health care. BMC Health Serv Res 2006;6:102.

17 Rahmqvist M, Bara AC: Patient characteristics and quality dimensions related to patient satisfaction. Int J Qual Health Care 2010;22:86–92.

18 Miravitlles M, Naberan K, Cantoni J, Azpeitia A: Socioeconomic status and health-related quality of life of patients with chronic obstructive pulmonary disease. Respiration 2011;82:402–408.

19 Foss C: Gender bias in nursing care? Gender-related differences in patient satisfaction with the quality of nursing care. Scan J Caring Sci 2002;16:19–26.

20 Foss C, Sundby J: The construction of the gendered patient: hospital staff's attitudes to female and male patients. Patient Educ Couns 2003;49:45–52.

21 Schmittdiel J, Grumbach K, Selby JV, Quesenberry CP Jr: Effect of physician and patient gender concordance on patient satisfaction and preventive care practices. J Gen Intern Med 2000;15:761–769.

22 Brédart A, Razavi D, Robertson C, Batel-Copel L, Larsson G, Lichosik D, Meyza J, Schraub S, von Essen L, de Haes JC: A comprehensive assessment of satisfaction with care: preliminary psychometric analysis in French, Polish, Swedish and Italian oncology patients. Patient Educ Couns 2001;43:243–252.

23 Kane RL, Maciejewski M, Finch M: The relationship of patient satisfaction with care and clinical outcomes. Med Care 1997;35:714–730.

24 Vinagre M, Neves J: The influence of service quality and patients' emotions on satisfaction. Int J Health Care Qual Assur 2008;21:87–103.

25 Donabedian A: The quality of care: how can it be assessed? JAMA 1988;260:1743–1748.

26 Barlési F, Boyer L, Doddoli C, Antoniotti S, Thomas P, Auquier P: The place of patient satisfaction in quality assessment of lung cancer thoracic surgery. Chest 2005;128:3475–3481.

27 Leo F, Radice D, Didier F, Carvalho FB, Spacca E, Madini M, Esposito C, Agnello M, Meneghin S, Spaggiari L: Does a personalized approach improve patient satisfaction in thoracic oncology? Am J Manag Care 2009;15:361–367.

28 Haviland MG, Morales LS, Dial TH, Pincus HA: Race/ethnicity, socioeconomic status, and satisfaction with health care. Am J Med Qual 2005;20:195–203.