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HINTS & KINKS

Importance weighting, expectation fulfilment and satisfaction: an integrative and innovative approach to measuring patient satisfaction with hospital stays

Christian Janssen · Oliver Ommen · Fueloep Scheibler · Markus Wirtz · Holger Pfaff

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Introduction

Patient satisfaction with treatment represents an important outcome in medical quality assurance (Donabedian 2003). However, previous research in this area has demonstrated theoretical and empirical deficiencies (Leimkühler and Mueller 1996; Sitzia 1999; Davoll et al. 2013). Relevant problem areas include failure to consider the patient's personal importance weighting of different aspects of a hospital stay, insufficient operationalisation of expectation fulfilment (Crow et al. 2002) and the consistently positive skew of satisfaction indices (Verbeek et al. 2001). One of the most common models for measuring patient satisfaction is the discrepancy model, which was originally derived from the concept of 'customer satisfaction'. This model describes satisfaction or dissatisfaction as being the result of the consumers' comparisons of their expectations regarding certain services with the services actually received (Neugebauer and Porst 2001). The approach we are presenting meets the following challenges: it measures patient satisfaction by considering individual expectation fulfilment and individual weightings of different aspects of a hospital stay.

C. Janssen (✉)
Faculty of Applied Social Sciences, Munich University of Applied Sciences, Am Stadtpark 20, 81243 Munich, Germany
e-mail: christian.janssen@hm.edu

O. Ommen
Department 1, Federal Centre for Health Education (BZgA), Cologne, Germany

F. Scheibler
Institute for Quality and Efficiency in Health Care (IQWIG), Cologne, Germany

M. Wirtz
Institute for Psychology, University of Education Freiburg, Freiburg, Germany

H. Pfaff
Institute of Medical Sociology, Health Services Research and Rehabilitation Science (IMVR), University of Cologne, Cologne, Germany

Methods and results

Data were gathered in a cross-sectional, retrospective postal survey of 2,470 inpatients (response rate 52.9 %) in the internal medicine and surgical wards of six hospitals in Germany (Cologne patient questionnaire; Pfaff et al. 2003). The analysis presented here is based on a subpopulation ($n = 225$) of the above study because only this group received questions regarding all three dimensions of patient satisfaction. This patient group exhibits no significant differences to the overall study population (Ommen et al. 2011).

The analysed dimensions comprise the following eight aspects of hospital services, which are considered to be significant with regard to achieving an overall assessment (Janssen et al. 2005):

(1) non-medical aspects (food, cleanliness and set-up of rooms) of the hospital; (2) ward organisation; (3) relationship with doctors on the ward; (4) relationship with nursing staff on the ward; (5) ward rounds; (6) medical treatment; (7) general information received while in hospital; and (8) patient involvement in the treatment. First, satisfaction was measured with the following introductory question about the above-mentioned aspects: "How satisfied were you with…". The possible answers were "dissatisfied", "rather dissatisfied", "neither dissatisfied nor satisfied", "rather satisfied" and "satisfied".

The 'satisfaction' variable (Cronbach's α: 0.91) is an index that adds the patient satisfaction ratings for each of the eight aspects. This operationalisation of satisfaction is based on a commonly used satisfaction concept.

The 'expectation fulfilment' variable (Cronbach's α: 0.87) measures the extent to which the hospital services fulfil the patient's expectations. This index includes the same aspects upon which the patient satisfaction index is based (see above). The respondents were asked to choose from the following responses: "much worse than expected", "slightly worse than expected", "just as expected", "slightly better than expected" and "much better than expected".

The 'importance' variable (Cronbach's α: 0.92) measures the patient's importance weighting of each of the different services offered by the hospital. This index uses the same aspects as the other two measurements described above and the following response categories are: "not at all important", "not important", "important" or "very important".

First, a satisfaction score (Fig. 1) was computed. It assigned values to the individual responses, from dissatisfied (=1) to satisfied (=5). Subsequently, the individual values for the respective area were added up and divided by the number of items. This score represents the satisfaction ('S') of the patient with various hospital services and is an established measurement of patient satisfaction (Raspe et al. 1997).

In the second step, satisfaction was combined with expectation fulfilment. Here, the respective expectation fulfilment rating was replaced by a value between −1 and +1 (Clausen et al. 2006; see Table 1):

Consequently, expectation fulfilment may or may not change the 'satisfaction' score. In the final step (see Table 2), each respondent's individual importance weightings of the various hospital services were integrated. This was done because concerning a hospital stay, patients may individually consider some aspects more important than others, and thus the impact of different aspects of the Expectation–Satisfaction Index on overall satisfaction will vary (Janssen et al. 2005).

The importance-weighted, expectation-adjusted satisfaction (IES) score was then calculated using the following formula: $IES = \Sigma(I_n{}^*(E_n + S_n))$; SPSS-syntax is available from the authors upon request. The distribution of the IES score does not significantly deviate from a normal distribution (Kolmogorov–Smirnov test, $p = 0.297$) and avoids the problematic ceiling effects in the measurement of patient satisfaction (Fig. 2).

Discussion

The presented index (IES) aims to measure patient satisfaction, taking into account the individual importance

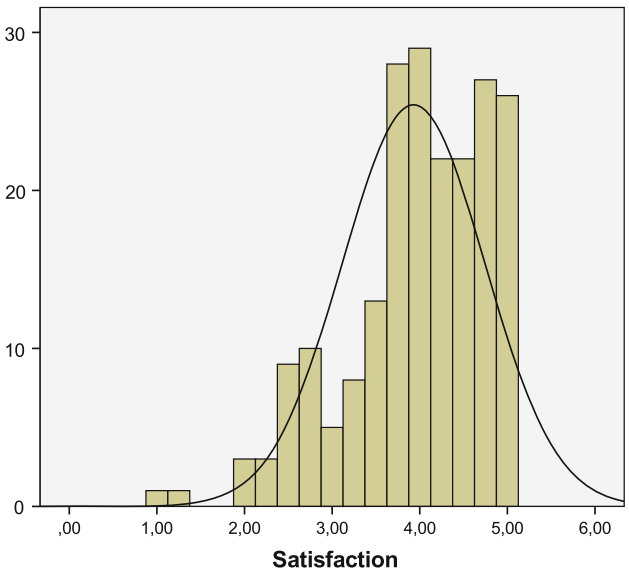

Fig. 1 Distribution of satisfaction (S), Cologne patient questionnaire (Pfaff et al. 2003), Cologne 2,000

Table 1 Operationalisation of the ES index ("Expectation Fulfilment and Satisfaction")

Satisfaction			Expectation fulfilment or non-fulfilment	
Answer	Value		Value	Answer
"dissatisfied"	1		-1	"much worse than expected"
"rather dissatisfied"	2	+	-0,5	"slightly worse than expected"
"neither dissatisfied nor satisfied"	3		0	"just as expected"
"rather satisfied"	4		+0,5	"slightly better than expected"
"satisfied"	5		+1	"much better than expected"

Table 2 Operationalisation of the importance weighting factor (*I*) of different aspects of a hospital stay for two extreme examples (patient A and patient B)

	"Not important in any way" = 1	"Not important" = 2	"Important" = 3	"Very important" = 4	Weighting factor
Patient A					
Non-medical aspects (food, cleanliness, etc.)				4	4/11
Ward organisation	1				1/11
Relationship with doctors	1				1/11
Relationship with nursing staff	1				1/11
Ward rounds	1				1/11
Medical treatment	1				1/11
Information received	1				1/11
Patient involvement in treatment	1				1/11
Patient B					
Non-medical aspects (food, cleanliness, etc.)	1				1/29
Ward organisation				4	4/29
Relationship with doctors				4	4/29
Relationship with nursing staff				4	4/29
Ward rounds				4	4/29
Medical treatment				4	4/29
Information received				4	4/29
Patient involvement in treatment				4	4/29

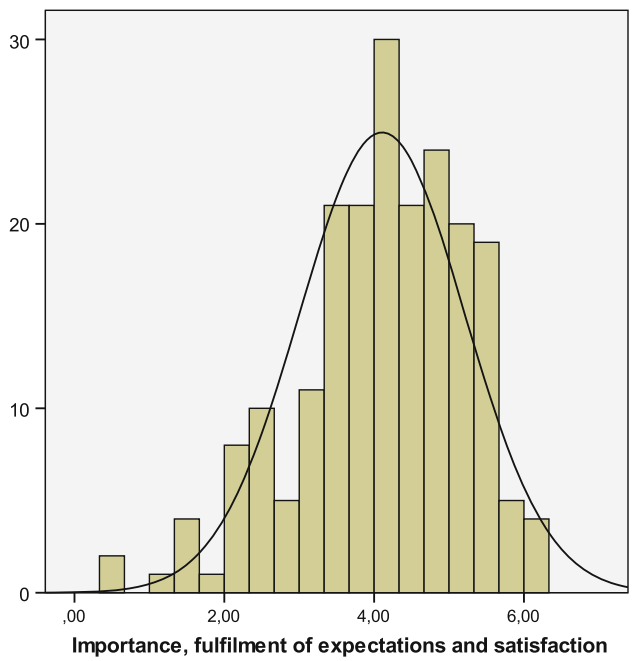

Fig. 2 Distribution of importance-weighted, expectation-adjusted satisfaction (IES), Cologne patient questionnaire (Pfaff et al. 2003)

weightings and expectation fulfilment to overcome the well-known theoretical and empirical deficits of other approaches. Ceiling effects, for instance, are problematic because they decrease the amount of variance in the variable and may lead to false conclusions by indicating that an independent variable no longer has an effect (Vogt 2011). With a normal distribution, it is also possible to apply more parametric statistical procedures, although non-normality can be appropriately accounted for by modern statistics. Moreover, the procedure that is described seems to be plausible in mathematical and theoretical respects and is easy to understand and to apply.

The order in which the questions are posed in the questionnaire regarding the aspects of importance-weighted, expectation-adjusted patient satisfaction seems to be of some significance: to avoid unwanted effects, it is advisable to query for subjective satisfaction first, followed by expectation fulfilment and finally importance. Otherwise, the respondent's answers may be biased by an increased awareness of possible relationships between these three factors.

The operationalisation of expectation fulfilment may seem a bit haphazard, and a psychometric substantiation of the scaling properties might be necessary. Although the distribution characteristics of the IES are more favourable than those of the 'pure measurement of satisfaction', its validation thus needs to be continued in further studies. This should include reliability analyses, IES factor analyses and verification of concurrent and criterion-oriented

validity, e.g. using the Picker questionnaire (Jenkinson et al. 2002). In this respect, it is important to establish the incremental validity of the IES in comparison to the pure measurement of satisfaction: the consideration of the patient's expectation should lead to an improved correlation with characteristics relevant to treatment or outcome. Despite the limitations described above, this method takes into account all the relevant aspects of hospital stays as well as the individual expectation fulfilment and importance weighting of these aspects using a valid, reliable and feasible measuring instrument.

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