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Article

Article

Does the patient's inherent rating tendency influence reported satisfaction scores and affect division ranking?

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Abstract

Objective: To determine the impact of adjusting for rating tendency (RT) on patient satisfaction scores in a large teaching hospital and to assess the impact of adjustment on the ranking of divisions.
Design: Cross-sectional survey.
Setting: Large 2200-bed university teaching hospital.
Participants: All adult patients hospitalized during a 1-month period in one of 20 medical divisions.
Intervention: None.
Main Outcome Measures: Patient experience of care measured by the Picker Patient Experience questionnaire and RT scores.
Results: Problem scores were weakly but significantly associated with RT. Division ranking was slightly modified in RT adjusted models. Division ranking changed substantially in case-mix adjusted models.
Conclusions: Adjusting patient self-reported problem scores for RT did impact ranking of divisions, although marginally. Further studies are needed to determine the impact of RT when comparing different institutions, particularly across inter-cultural settings, where the difference in RT may be more substantial.

Key words: patient satisfaction, survey, rating tendency, case-mix adjustment

Introduction

Patient satisfaction surveys are routinely used to assess quality of care and are one of the indicators of good care [1–4]. Higher patient satisfaction scores are associated with better healthcare processes [5–9], and can be associated with lower morbidity and mortality [5, 10–12]. In addition, mean satisfaction scores can be used to rank hospitals [13] and such rankings can help patients choose their provider [14]. For these reasons, the validity of patient satisfaction scores as indicators of healthcare quality is an important issue. A recurrent question is whether satisfaction scores should be adjusted or not, and if so, for what variables [15]. Indeed, many factors influence satisfaction scores and ratings, which may or may not be linked to the quality of care provided [10] and it is common practice to adjust satisfaction scores to take into account this variability. Variables related to patient case-mix, such as patient age [16–18], sex [16], self-reported physical health [19, 20], mental well-being [21, 22] and socio-economic status, as well as length of stay (LOS) [23] are commonly adjusted for in analyses [16, 22, 24], in order to attenuate differences in satisfaction scores due to differing case-mix among institutions. However, would a statistical

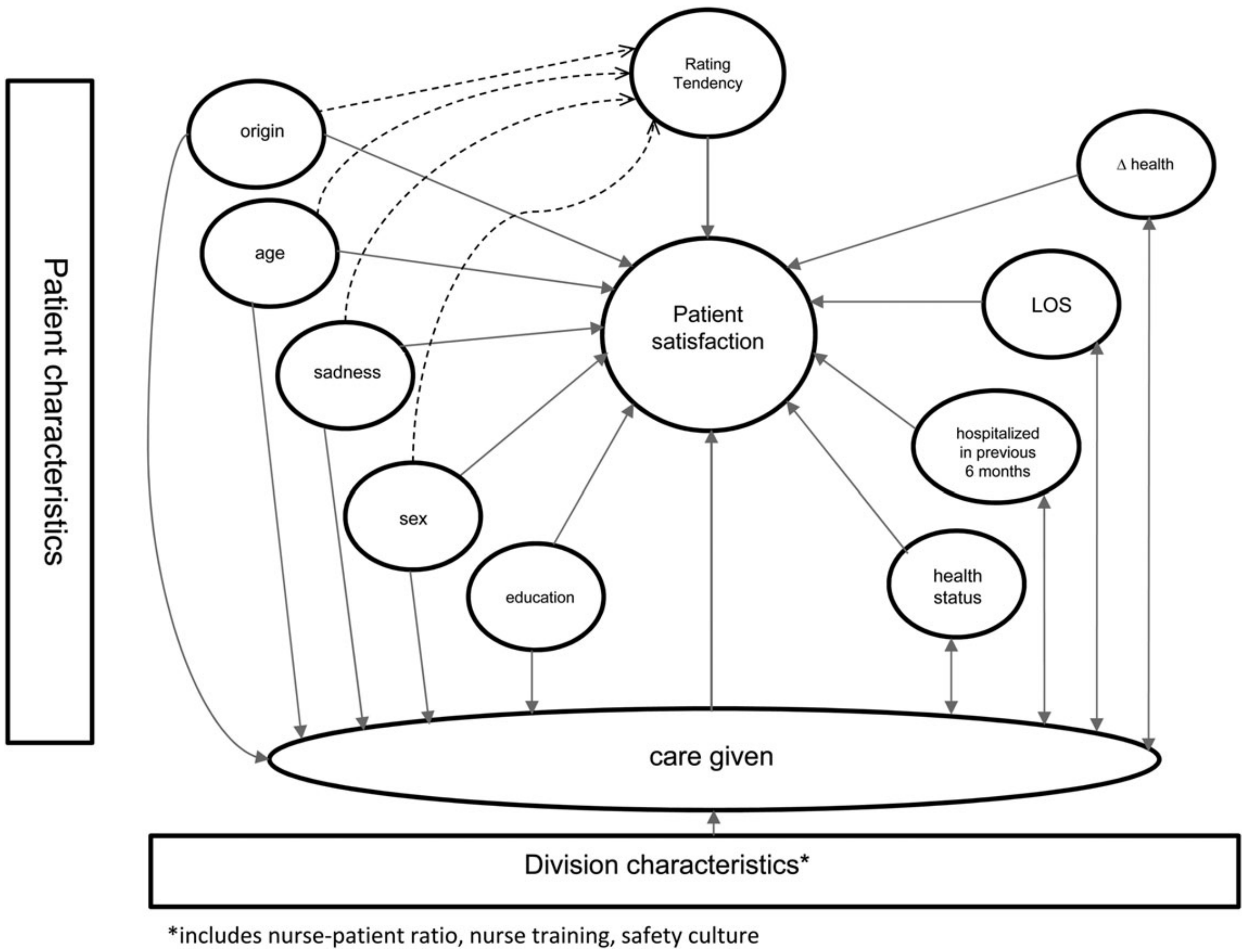

Figure 1 Theoretical framework of patient satisfaction, rating tendency and case-mix.

adjustment for these variables resolve the problem and improve comparability of satisfaction scores between different patient populations? Maybe not, because these patient case-mix variables may also be associated with different patterns of care, so that adjusting for them would cause over-adjustment. For example, poor health status may be associated with invasive, extended or painful treatment, which may be a legitimate cause of dissatisfaction. Arguably, the only variable that is unrelated to care is a patient's inherent tendency to be satisfied with hospital care, i.e. their 'rating tendency (RT)' [25] (Fig. 1). For the same care received, some patients might be easy to please and give excellent satisfaction ratings whilst others might be more critical and give poor ratings for equivalent care. There is some evidence that patients' personality types or traits (such as neuroticism, extraversion, openness, agreeableness and conscientiousness) are linked to differing levels of satisfaction. In particular, studies have shown that neuroticism and openness are related to decreased satisfaction whilst agreeableness is associated with higher satisfaction [26–28]. In oncology patients, Type D personality is associated with lower satisfaction with medical information [29]. Nonetheless, there are no studies exploring the association between a patient's inherent RT, satisfaction scores and the impact of RT adjustment on hospital division ranking.

A prior study was carried out to validate the instrument used to measure a patient's RT in the division of orthopaedics of the University Hospitals of Geneva, Switzerland [25] and to explore the effect of RT adjustment on patient satisfaction scores, which was small. The present study further explores the relationship between this scale and patient satisfaction and other patient characteristics such as sex and the feeling of sadness that were shown to be associated with RT in the previous study. In addition this study explores the effect of RT adjustment when comparing mean satisfaction scores across divisions of a large teaching hospital in particular to see if ranking of divisions according to mean satisfaction scores is changed by RT and case-mix adjustment.

Methods

Study design and setting

Four to six weeks after discharge, all adult patients (at least 18 years old at time of discharge), hospitalized for at least 24 h between 15 September and 15 October 2008 were mailed a validated inpatient hospital satisfaction questionnaire based on the Picker questionnaire [30]. Non-respondents received up to two additional questionnaires and three reminder cards inviting them to participate. Because the survey was part of an ongoing institutional quality of care evaluation and carried no risk to participants, it was exempted from full review by the Research Ethics Board.

Patients without a valid address, who felt too sick to participate (who returned the questionnaire but ticked the item 'I cannot participate due to my poor health' on the mailed questionnaire) or who had died before returning a completed questionnaire were considered ineligible and excluded from the final analysis. Adult patients from all divisions were included and were given up to 1 month after the last mailed questionnaire to respond. The survey was extended to 15 December for the divisions of Geriatrics and Psychiatry to increase the study sample for these divisions as they had typically lower turn-over and lower response rates than other departments [31].

Questionnaire and variables

The mailed questionnaire included the unabridged Picker satisfaction questionnaire [30] compromising 44 questions, the RT scale [25], 10 questions on socio-demographic variables, 9 questions on hotel and catering aspects, 1 on the transportation experience, 4 on patient and caregiver identification, 2 questions on surgery planning and 6 questions on the organization of discharge. For certain divisions (Geriatrics, Psychiatry and Cardiology), 15–20 supplementary questions based on their specific concerns on quality of care, were added. The scale to measure RT consisted of 12 questions based on hypothetical scenarios (vignettes) that were to be evaluated on a scale of 1–7 for quality of care (1: very poor, 7: excellent). The first two scenarios described excellent and very poor quality of care, respectively, and were used as anchoring items to verify that the participants understood the rating task. The subsequent scenarios described hospitalizations that were more or less problematic due to various issues related to quality of care (e.g. lack of communication or intimacy, technical difficulties, occurrence of adverse events with health consequences). The patient's RT score was calculated according to the mean of the 10 non-anchoring ratings. This score has been previously described and validated in our institution [25]. Patient satisfaction with care was assessed using the Picker-15 problem score [30, 32] (PPE-15), a previously validated instrument in general and European populations [30], which is a summary measure of problems in patients' experience of care. This score evaluates patient satisfaction according to 15 questions and is scored from 0 to 100%. As this is a problem score, lower scores denote less problematic care and therefore higher satisfaction.

Additional variables collected included age, sex, country of birth, level of education, LOS, perceived health status and feeling sad or blue in the past 4 weeks.

Analysis

Firstly, the psychometric properties of the RT scale were verified, by conducting a confirmatory factor analysis, and assessing its internal consistency using the Cronbach α coefficient. Differences between respondents and non-respondents were explored with the χ^2 test for categorical variables and the Kruskal–Wallis test for continuous variables. Case-mix variables to be used in multivariate analyses were identified a priori based on case-mix variables typically adjusted for in patient satisfaction studies. Mean problem scores (PPE-15 problem scores) and mean RT scores were compared across subgroups and hospital divisions. The 20 largest divisions were ranked according to crude mean PPE-15 scores from lowest mean problem score to highest mean problem score. Multivariate ordinary least squares regression analyses were conducted with PPE-15 as the dependant variable. PPE-15 scores were compared across the 20 largest divisions after adjusting for RT and after adjusting for socio-demographic variables (age, sex, health status, education level, place of birth, depression, LOS). The adjusted mean scores were used to re-rank divisions. All analyses were carried out on Stata 12 (TX, USA).

Table 1 Sample characteristics of respondents and non-respondents of the rating tendency scale

Variable	Respondents	Non-respondents	*P*-Value[a]
Age category *n* (%)			
18–24 years	92 (5.1)	94 (6.5)	
25–44 years	508 (28.0)	459 (31.7)	
45–64 years	454 (25.1)	341 (23.5)	
65–84 years	603 (33.3)	375 (25.9)	
>85 years	155 (8.6)	180 (12.4)	<0.001
Sex *n* (%)			
Women	849 (60.3)	1057 (57.1)	
Men	559 (39.7)	795 (42.9)	0.064
Nationality *n* (%)			
Swiss	737 (53.1)	196 (60.5)	
European	461 (33.2)	93 (28.7)	
Non-European	190 (13.7)	35 (10.8)	0.051
Education *n* (%)			
Compulsory school	320 (23.27)	113 (37.8)	
Apprenticeship	447 (32.5)	99 (33.1)	
Secondary school	149 (10.8)	22 (7.4)	
Professional school	199 (14.4)	36 (12.0)	
University	260 (18.9)	29 (9.7)	<0.001
LOS mean (med, IQR, SD)	11.7 (5, 8, 23.7)	27.4 (10, 21, 81.9)	<0.001

[a]Pearson's χ^2 for categorical variables and Kruskal–Wallis for continuous variables.

Results

Of the 3736 patients, 475 were considered ineligible and excluded from analysis (patients without a valid address, not speaking French, too sick to answer or deceased). Of the remaining 3261 patients, 1812 (55.6%) returned the completed questionnaire and 1409 (43.2%) answered at least half of the RT vignette questions and half of the PPE questions. Non-respondents were much older (>85 years), had longer LOS and lower levels of education (Table 1).

RT scale properties

Most patients understood the task of rating the clinical scenarios and rated the difference between anchoring items on opposite ends of the scale. The difference between the anchoring items was the maximum (6) for the majority (51.8%) of respondents and more than three points for 86.9% of respondents.

Factor analysis showed the RT scale to be unidimensional with a single factor that had an eigenvalue of more than 3 and a compatible scree plot. Scale reliability (Cronbach's α) was 0.82.

RT and case-mix variables

RT scores were approximately normally distributed with a mean of 3.64 and a median of 3.60 (SD 0.96, 25th percentile: 3.00; 75th percentile: 4.20). RT varied across subgroups (Table 2). Women and younger patients gave significantly lower ratings as did patients born outside of Switzerland. Feeling downhearted and blue was also associated with a tendency to give lower ratings.

Despite adjustment for socio-demographic variables associated with RT (sex, age, place of birth and sadness), RT remained significantly associated with PPE-15 scores. Multicolinearity testing in the

Table 2 Mean rating tendency scores (RT) across subgroups of respondents (*n*: 1409)

Variable	*n* (%)	RT score	*P*-Value[a]
Sex			
Women	849 (60.2)	3.51	
Men	559 (39.7)	3.73	<0.001
Age (years)			
18–24	81 (5.7)	3.47	
25–44	445 (31.6)	3.47	
45–64	376 (26.7)	3.64	
65–84	407 (28.9)	3.70	
>85	90 (6.4)	3.77	0.002
Nationality			
Swiss	737 (53.1)	3.65	
Other European	461 (33.2)	3.55	
Non-European	190 (13.7)	3.55	0.032
Level of education			
Compulsory school	320 (23.3)	3.65	
Apprenticeship	447 (32.5)	3.60	
Secondary school	149 (10.8)	3.50	
Professional school	199 (14.4)	3.60	
University	260 (18.9)	3.60	0.500
Perceived health status			
Excellent	119 (8.7)	3.67	
Very good	273 (19.9)	3.61	
Good	617 (44.9)	3.58	
Fair	290 (21.1)	3.57	
Poor	75 (5.4)	3.60	0.970
Hospitalization during past 6 months			
Once	959 (69.8)	3.61	
>Once	414 (30.2)	3.61	0.790
Feeling downhearted and blue the past 4 weeks			
All the time	41 (3.0)	3.37	
Most of the time	173 (12.5)	3.44	
Sometimes	529 (38.4)	3.63	
Rarely	370 (26.9)	3.61	
Never	265 (19.2)	3.65	0.020[b]
Perceived change in health status			
Much better	370 (27.0)	3.63	
Somewhat better	480 (35.1)	3.59	
Same	373 (27.5)	3.59	
Worse	99 (7.2)	3.60	
Much worse	47 (3.4)	3.56	0.960
Length of stay (days)			
2–9	1010 (71.7))	3.61	
10–30	287 (20.4)	3.56	
>30	112 (7.9)	3.64	0.520

[a]Kruskal–Wallis test.
[b]Ordinary least squares regression.

regression model, including RT and case-mix variables associated with RT, was negative with all variable inflation factors being below 5.

Satisfaction and RT

PPE-15 problem scores had a mean of 32.4% with a standard deviation of 24.6%. The correlation between RT and problem scores was weak but statistically significant (Spearman's ρ −0.10, $P < 0.001$).

RT across divisions

Mean RT scores were compared across the 20 largest divisions. Differences were modest (Table 3) with a minimum rating given by the division of Gynaecology followed closely by Obstetrics and the maximum rating given by the division of General Internal medicine. Differences in RT across divisions remained statistically significant despite adjustments for age, sex, sadness and place of birth, variables that were associated with the RT score in our population (results not shown).

Table 3: Mean rating tendency scores across 20 largest divisions

Division	*n* (%)	Mean RT (SD)[a]
Gynaecology	67 (5.7)	3.42 (0.98)
Obstetrics	200 (16.9)	3.43 (0.75)
Adult general psychiatry	59 (5.0)	3.44 (0.93)
General rehabilitation	49 (4.1)	3.45 (0.97)
Short term psychiatric ward	40 (3.4)	3.46 (0.86)
Thoracic surgery	27 (2.3)	3.49 (0.93)
Ophthalmology	27 (2.3)	3.50 (0.98)
Neurosurgery	47 (4.0)	3.56 (0.84)
Neurology	36 (3.0)	3.58 (0.92)
Visceral surgery	156 (13.2)	3.63 (0.85)
Geriatrics	44 (3.7)	3.66 (0.98)
Geriatric rehabilitation	32 (2.7)	3.67 (1.07)
Cardiac surgery	28 (2.4)	3.67 (1.02)
ENT	42 (3.6)	3.68 (0.86)
Orthopaedics	92 (7.8)	3.74 (0.83)
Urology	53 (4.5)	3.76 (0.73)
Osteo-articular disease	26 (2.2)	3.79 (0.92)
Cardiology	51 (4.3)	3.86 (0.87)
Hand surgery	26 (2.2)	3.92 (1.33)
General internal medicine	81 (6.8)	3.96 (1.06)

[a]Kruskal–Wallis test: $P = 0.02$.

Mean PPE scores across divisions and division ranking

Mean PPE problem scores varied significantly across the 20 largest divisions (Kruskal–Wallis test: $P < 0.001$). Adjusted PPE scores varied according to the model of adjustment (adjustment for the RT score versus for socio-demographic variables) (Figs 2 and 3). The RT adjusted rankings did not affect PPE scores appreciably, nor did they substantially change division ranking (Fig. 2), with 4 of the 20 largest divisions changing rank. In contrast, the overall position of 15 divisions changed drastically in the socio-demographic variable adjusted model (Fig. 3). Notably two divisions with PPE-15 problem scores above institutional mean before adjustment (top right quadrant of Fig. 2) moved to the category of divisions with lower than average problem scores (bottom right quadrant of Fig. 3) after adjustment for case-mix (crude PPE-scores of 32.8% for the 1st division and 35.0% for the 2nd division and PPE-scores of 30.1 and 28.8%, respectively, after socio-demographic adjustment).

Discussion

Analysis of the vignettes confirmed their ability to measure a single latent variable (hereafter named 'RT'), further validating the RT score among patients of a large teaching hospital. Factors associated with RT were sex, age, country of birth and a feeling of sadness. In addition, RT was moderately associated with satisfaction with care but not with health status, further confirming that this tendency is not merely a proxy of severity of illness or the care received, but likely an independent characteristic of patients that could act as a potential confounder of satisfaction scores [25]. Moreover, the association between RT and PPE-15 problem scores persisted after adjustment for

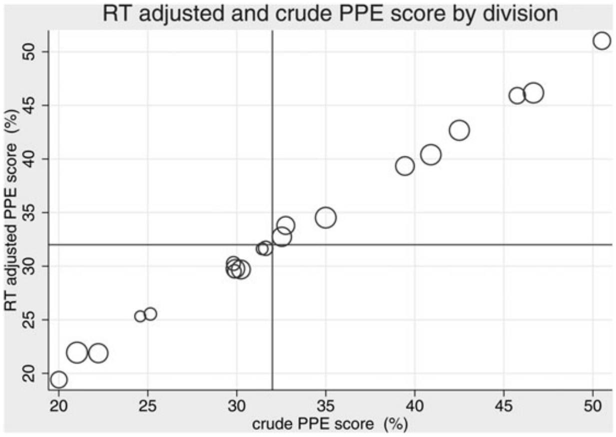

Figure 2 Institutional mean PPE score represented by the overlaid intersecting lines. Top right quadrant divisions have higher than average problem scores. Circle surface is proportional to division size.

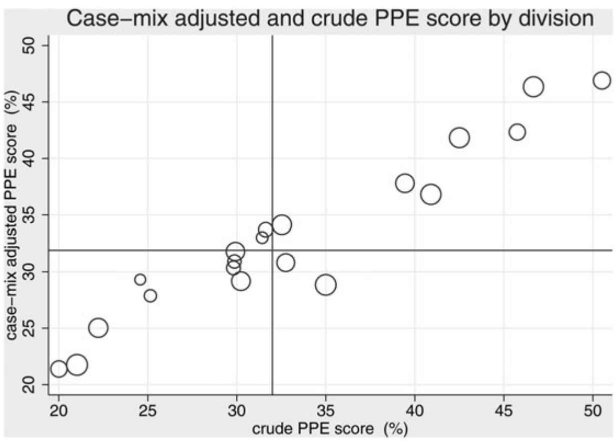

Figure 3 Institutional mean PPE score represented by the overlaid intersecting lines. Bottom left quadrant divisions have lower than average problem scores. Circle surface is proportional to division size.

case-mix variables establishing the relationship between PPE-15 and RT as distinct from case-mix variables.

Mean RT scores varied significantly across divisions, even if the differences were rather small in absolute terms. As a result, adjusting PPE-problem scores for RT had only a minor impact on division ranking in our study. It may be that adjusting for RT would have a stronger impact when comparing hospitals within a country rather than divisions within a hospital, where the RT would probably be more divergent. As is shown in our analyses, RT is in part culturally determined, and therefore adjustment for RT may have the greatest utility when comparing hospitals from contrasting cultures, as may be the case for urban versus rural hospitals, or hospitals from different linguistic regions or different countries. Further studies would be needed to explore this assumption and explore RT scores across different cultural backgrounds. We suggest that when hospitals are to be compared, at least one round of patient satisfaction surveys should include a measure of RT, and the non-adjusted and RT-adjusted results compared. If adjusting for RT has little or no impact, further surveys should report unadjusted satisfaction scores. However, if adjusting for RT results in substantial changes in hospital-specific results, it ought to be included in subsequent surveys, and adjusted for.

Our study also underlines the importance of choice of covariates used in multivariate adjustments and challenges the common practice of adjusting satisfaction for usual case-mix variables. Although our comparisons were conducted in a single institution, division rankings showed some degree of variation depending on the model of adjustment chosen. If the chosen variables solely represent patient characteristics that are unrelated to care, adjusting for them would be justified. However, it can also be argued that socio-demographic covariates commonly used in adjustment could directly or indirectly stand in for the quality of care provided to specific patient subgroups (Fig. 1). For example, a patient's age, nationality, sex and education level could elicit differential behaviour among care-givers and therefore adjusting for these patient attributes could spuriously diminish actual and relevant differences in satisfaction scores. Similarly, health-related variables such as perceived health status, history of a recent hospitalization or LOS during a given episode of care could be associated with the type or quality of care given. When that is the case, adjusting for these variables would not be advisable (Fig. 1).

Study limitations

Although the response rate to the full satisfaction questionnaire was satisfactory (55.6%), only 43.2% of eligible patients answered the clinical vignettes assessing RT. This lower response rate may be due to the length of the full questionnaire (around 100 questions) and the fact that the vignettes were included at the very end. However, other studies have shown that varying response rates can still produce valid results [33]. Furthermore, this study was conducted at a single hospital, and the conclusions are not necessarily generalizable to other settings.

Conclusion

We observed some variations in patients' RT across divisions in a large university hospital. Models that adjusted for RT, rather than for commonly measured case-mix variables, had a different impact on the ranking of hospital division: the former showing fewer changes in ranking than the latter. In light of the likelihood of over-adjustment with case-mix variables, we believe that adjusting for RT is a more reasonable approach to consider. This could be particularly relevant when RT scores are likely to differ, such as when comparing populations displaying important cultural differences. Further studies are needed to determine the impact of RT in inter-cultural, inter-regional and international comparisons of institutions for patient satisfaction with care.

Conflict interest statement

None declared.

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