

Is personality a determinant of patient satisfaction with hospital care?

A. A. J. HENDRIKS^{1,2}, E. M. A. SMETS², M. R. VRIELINK³, S. Q. VAN ES³ AND J. C. J. M. DE HAES²

¹Department of Psychology, Applied Psychology, University of Zurich, Zurich, Switzerland, ²Department of Medical Psychology, and

³Department of Quality Improvement, Academic Medical Center/University of Amsterdam, Amsterdam, The Netherlands

Abstract

Objective. We investigated to what extent personality is associated with patient satisfaction with hospital care. A sizeable association with personality would render patient satisfaction invalid as an indicator of hospital care quality.

Design. Overall satisfaction and satisfaction with aspects of care were regressed on the Big Five dimensions of personality, controlled for patient characteristics as possible explanatory variables of observed associations.

Participants. A total of 237 recently discharged inpatients aged 18–84 years ($M = 50$, $SD = 17$ years), 57% female, who were hospitalized for an average of 8 days.

Instruments. The Satisfaction with Hospital Care Questionnaire addressing 12 aspects of care ranging from admission procedures to discharge and aftercare and the Five-Factor Personality Inventory assessing a person's standing on Extraversion, Agreeableness, Conscientiousness, Emotional stability, and Autonomy.

Results. Agreeableness significantly predicted patient satisfaction in about half of the scales. After controlling for shared variance with age and educational level, the unique contribution of Agreeableness shrank to a maximum of 3–5% explained variance. When one outlier was dropped from the analysis, the contribution of Agreeableness was no longer statistically significant.

Conclusion. Patient satisfaction seems only marginally associated with personality, at least at the level of the broad Big Five dimensions.

Keywords: Big Five, patient satisfaction, personality

Patient satisfaction assessment is becoming part and parcel of hospital care quality monitoring and improvement programs [1–3]. Over the years, much research has been devoted to study which variables determine satisfaction with care, especially those variables that may threaten the validity of patient satisfaction as an indicator of care quality. If patients' ratings are biased, it may bias hospital management's conclusions about the level of care that has been provided. Moreover, biased ratings hinder comparisons between hospital wards or between care quality assessments at different occasions. Much attention has been paid to which extent patient characteristics like gender, age, educational level, length of hospital stay, self-perceived health status or patients' expectations influence satisfaction with care [1,4–9]. A consistent finding, for instance, is that older and less educated patients are more satisfied with care than younger and highly educated patients [5,7]. We investigated whether personality traits influence patients' evaluations of hospital care. If personality plays an important role, it may explain in part why satisfaction is almost invariantly high and judgements of aspects of care usually found correlated [10,11].

Personality traits refer to stable individual differences in the way people act, react, feel, and how they perceive the world. These differences are associated with how people function in a wide variety of life domains such as work, family, and health [12]. Personality traits might thus be associated also with how patients experience and evaluate health care. Relatively little is known about this. Initially, research focused on a few specific traits. Visser and colleagues [13] studied the role of locus of control, gratitude, and fear of complaining. Gratitude especially proved an important predictor of satisfaction with care. Others studied the role of perceived (illness specific) self-efficacy, helplessness, and depression. Perceived self-efficacy appeared predictive of satisfaction with the health care facility and with physicians and nurses [14].

Nowadays, the focus has shifted to integrated personality models, aimed at giving a rather complete picture of personality, in terms of a small number of broad (bipolar) dimensions on which people differ. One such model is the Big Five or Five-Factor Model (FFM), which, in the early 1990s, gained wide acceptance as a working hypothesis of personality trait structure [15]. The first four factors are usually called Extraversion (talkative, outgoing versus silent, introverted), Agreeableness

Address reprint requests to A. A. J. Hendriks, Department of Psychology, Applied Psychology, University of Zurich, Universitätstrasse 84, CH-8006. Zurich, Switzerland. E-mail: jolijn.hendriks@planet.nl

(mild, agreeable versus bossy, domineering), Conscientiousness (organized, neat versus disorganized, sloppy), and Emotional stability or, conversely, Neuroticism (unemotional, even tempered versus emotional, moody). The fifth factor is best known as intellect or openness to experience, but dispute is still going on with respect to its label and precise content [16]. Of these broad dimensions, Neuroticism appears negatively and Agreeableness positively associated with patient satisfaction [17,18]. However, at the time we conducted our study, only some role for Neuroticism was known [17].

We used an FFM instrument in which the fifth factor represents Autonomy. Our hypotheses stem from observations in trait taxonomic research from which the FFM emerged. In trait research, *satisfied* appears associated primarily with Agreeableness and secondarily with Emotional stability [19]. We therefore expected Agreeableness and Emotional stability to predict patients' evaluations of hospital stay. We expected minor roles, if any, for Extraversion, Conscientiousness, and Autonomy. Extraverted patients may find it easier to communicate their fears, needs, and wishes to the hospital staff and thus be more satisfied with their care than those who are more introverted. Organized, neat and orderly patients (high on Conscientiousness) may find it more difficult than less organized and orderly patients to adapt to an environment that is not as predictable to them as liked, which could result in being less satisfied than those low on Conscientiousness. Finally, hospitalized patients are inherently dependent. Autonomous people may find this more troublesome than those low on Autonomy and, therefore, be less positive about their care. Autonomous people are characterized as being critical, analytical, and striving to arrive at their own opinions, whereas people low on Autonomy are inclined to take things for granted.

Like patient satisfaction, personality traits are associated with person variables such as gender, age, and educational level [20,21]. Those variables were statistically controlled for. Our research question was whether personality traits explain variance in patient satisfaction over and above variance explained by mutual background variables.

Method

Participants

Subjects were participants in a patient satisfaction survey held at six hospital wards at the Academic Medical Center (AMC), Amsterdam, The Netherlands. Apart from having a top-referral function, the AMC also provides normal intramural medical care for part of Amsterdam and its vicinity. The six wards composed a stratified selection of wards divided across four general care divisions (Internal, Surgical, Neurological, and Obstetric Medicine). The larger divisions, Internal and Surgical, were each represented by two wards.

Instruments

Patient satisfaction. Patients completed the Satisfaction with Hospital Care Questionnaire (SHCQ) [22,23], a 55-item

self-report patient satisfaction questionnaire adapted from Visser [10]. The SHCQ addresses 12 aspects of care: admission procedures, nursing care, medical care, other disciplines, information, patient autonomy, emotional support, 'hotel' aspects of care, recreation facilities, miscellaneous aspects (e.g. rules and regulations, privacy), ease of access to the hospital, and discharge and aftercare. For reasons beyond the scope of this article, two different response scales were used [23,24]. A random half of the patients per ward responded on a 5-point scale, anchored 1 (*dissatisfied*), 2 (*moderately satisfied*), 3 (*sufficiently satisfied*), 4 (*clearly satisfied*), and 5 (*very satisfied*). The other half of the patients per ward responded on a 10-point scale ranging from 1 (*very poor*) to 10 (*excellent*). General instructions were 'This questionnaire is about different aspects of staying in hospital, and your (most recent) experience with these. To the hospital, it is important to know your opinion in this matter. Please indicate per item . . .', followed by the item response scale and an example. In addition, patients were asked for an overall rating of hospital stay ('Overall, how would you rate your stay?'). This overall rating was expressed on the 10-point response scale ranging from 1 (*very poor*) to 10 (*excellent*). Finally, a number of items assessed patient characteristics: gender, age, educational level, mother tongue (1 = *Dutch*, 2 = *other*), self-rated health (1 = *poor* to 5 = *excellent*), and patients' expectations about their hospital stay (1 = *it turned out much worse than expected* to 5 = *it turned out much better than expected*).

Personality. Personality was assessed by the Five-Factor Personality Inventory (FFPI), yielding scores on Extraversion, Agreeableness, Conscientiousness, Emotional stability, and Autonomy [21]. The reliability and construct validity of this instrument has been well established [21,25]. The FFPI consists of 100 brief statements in the third person singular, which can be used for other ratings as well as for self ratings. Examples are *starts conversations* (Extraversion), *accepts people as they are* (Agreeableness), *loves order and regularity* (Conscientiousness), *readily overcomes setbacks* (Emotional stability), and *takes the initiative* (Autonomy). Patients indicated per item the extent to which the trait was applicable to them (1 = *not at all applicable* to 5 = *entirely applicable*). To tune patients in their ratings to a *trait* view rather than a *state* view, which may have arisen from experiencing a possible serious illness, the general instruction was preceded by a situation-specific instruction. This stated: 'Please let your answers *not* be influenced by your *current* condition resulting from your illness or other reason for having been hospitalized. What this questionnaire is about is how you came to know yourself *in the course of your lifetime*'.

Procedure

Per ward, approximately 200 recently (to a maximum of 3 months ago) discharged patients were sent the SHCQ and a stamped return envelope to their home address. All patients older than 18 years of age who had stayed for at least 3 days and were not registered as having died were considered eligible for inclusion. The accompanying letter assured confidentiality. After 3 weeks, a reminder was sent to those who had not responded, together with another copy of the SHCQ.

At the bottom end of the questionnaire, we asked patients to indicate whether they would be willing to complete another questionnaire assessing personality traits. Those who agreed were sent the FFPI and a stamped return envelope. Respondents received a national lottery ticket in return for their participation.

Analysis

Respondents to the SHCQ who used a 5-point scale and those who used a 10-point scale were combined in one group, after within-group transformation of scale scores to z scores ($M = 0$, $SD = 1$). This was to maximize the number of observations, thus power. Combining these subgroups was warranted because no large differences between response scales have been found [23,24]. Scale scores were computed by summing up responses across the relevant items. However, we excluded seven items (spread across scales), with more than 50% missing values. If items showed less than 50% missing values, within-group item means were substituted for missing values. This procedure only slightly reduced the variance of the scale scores compared with using complete cases only.

The FFPI is scored as weighted sums of a person's 100 item responses, yielding uncorrelated factor scores retaining absolute information [21]. We replaced missing values (range: 0–7, $M = 0.1$, $SD = 0.6$) by a respondent's mean score on the answered items for the same factor pole, rounded to the nearest integer value. Almost all patients (95%) completed all 100 items.

Patient satisfaction was regressed on personality, controlling for shared relationships with patient characteristics. Separate analyses were performed for overall satisfaction and for satisfaction with each aspect of care. We applied a Bonferroni-type correction for multiple tests of significance [26]. Family-wise Type I error rate was set at $\alpha = 0.10$. Before the regressions, we examined the data for evidence of multivariate outliers on the personality predictors [27].

Results

Sample description and response rates

The FFPI was completed by 237 patients, i.e. by 33% of the respondents to the satisfaction questionnaire ($n = 728$) and 20% of the initial sample ($N = 1184$). Those who completed the FFPI were 57% females, aged 18–84 years ($M = 50$ years, $SD = 17$ years) and hospitalized for an average of 8 days (median: 6 days). Educational level varied from primary school (18%), secondary school (35%), high school (18%) to university (25%); in 4% of the cases, educational level was not indicated.

A few significant (family-wise $\alpha = 0.10$) differences were found between those patients who did and who did not complete the FFPI. FFPI respondents ($M = 7.9$ days, $SD = 7.1$) had spent significantly less days in hospital than FFPI non-respondents ($M = 9.4$ days, $SD = 10.5$), $t(526) = 2.62$, $P = 0.009$. Compared with those patients who completed the SHCQ only, FFPI respondents were significantly more highly

educated, $\chi^2(3) = 13.06$, $P = 0.005$. Then, likely, FFPI respondents were significantly more highly educated compared with all FFPI non-respondents (could not be tested directly). Finally, FFPI respondents were significantly more satisfied with medical care and nursing care than those respondents who completed the SHCQ only, $t(726) = 2.77$, $P = 0.006$ and $t(726) = 2.61$, $P = 0.009$, respectively.

Scale descriptives and reliabilities

In Table 1, we provide the scale descriptives. Internal consistency reliability of the personality scales varied from 0.77 (Autonomy) to 0.85 (Extraversion). Concerning the satisfaction scales, internal consistency reliability was rather low for other disciplines (three items, $\alpha = 0.43$), patient autonomy (two items, $\alpha = 0.49$) and recreation facilities (three items, $\alpha = 0.59$). Other α s varied from 0.74 (ease of access) to 0.91 (nursing care, medical care, and emotional support). The SDs of the satisfaction scale scores did not differ much from what we observed in the total sample, with or without missing values substitution (table available from the first author). The SDs of patients' Big Five scores were all close to their expected magnitudes ($SD = 1$).

Bivariate correlations between patient characteristics, personality, and patient satisfaction

We first established zero-order product–moment correlations between patient characteristics, personality traits, and patient satisfaction, in order to determine which patient characteristics to hold constant in the regressions of patient satisfaction on personality (Table 2). Significantly associated with both personality and patient satisfaction were age and educational level. Gender and mother tongue correlated with personality but not with patient satisfaction. Patients' self-rated health and especially patients' expectations ($0.17 \leq r \leq 0.50$) correlated with many or all satisfaction scales but not with personality. The 12 satisfaction scales measuring aspects of care were substantially correlated with overall satisfaction ($0.40 \leq r \leq 0.71$, mean $r = 0.57$) as well as with each other ($0.22 \leq r \leq 0.64$, mean $r = 0.45$).

Of the personality scales, mainly Agreeableness was significantly associated ($0.12 \leq r \leq 0.25$) with patient satisfaction. A few additional significant but weak associations ($0.11 \leq r \leq 0.16$) were found for Autonomy (admission procedures, medical care, hotel aspects of care, overall hospital stay), Conscientiousness (admission procedures, other disciplines, hotel aspects of care), Emotional stability (other disciplines, hotel aspects of care, and ease of access), and Extraversion (discharge and aftercare). Except for those concerning Conscientiousness, all (significant) associations were in the expected direction.

Prediction of patient satisfaction from personality

We first regressed a general patient satisfaction dimension accounting for the common variance in all (12) satisfaction

Table I Scale descriptives

Scale	No. of items in scale	Scale mean	SD	Cronbach's alpha
<i>Personality</i>				
Extraversion	100	0.73	1.06	0.85
Agreeableness	100	2.65	1.03	0.82
Conscientiousness	100	1.24	1.04	0.82
Emotional stability	100	1.00	0.99	0.81
Autonomy	100	1.00	1.09	0.77
<i>Satisfaction</i>				
Admission procedures	3	0.11	1.01	0.75
Nursing care	5	0.14	0.97	0.91
Medical care	5	0.15	0.95	0.91
Other disciplines	3	0.07	0.96	0.43
Information	6	0.12	1.00	0.86
Patient autonomy	2	0.13	1.08	0.49
Emotional support	2	0.07	1.06	0.91
Hotel aspects of care	6	0.05	1.00	0.78
Recreation facilities	3	0.08	1.01	0.59
Miscellaneous aspects	5	0.12	1.03	0.80
Ease of access	4	0.11	0.97	0.74
Discharge and aftercare	4	0.10	0.99	0.82
Overall hospital stay	1	7.71	1.19	–

$N = 237$. The personality scale scores are standardized scores of which the mean may deviate from zero due to using the midpoint of the response scale as the reference point rather than the mean of the population [21]. Possible range of satisfaction with overall hospital stay: 1–10. All other satisfaction scale means were computed from within-group (5- and 10-point response scales, respectively) standardized scale scores.

scales on the Big Five. We so determined which personality scales to include in further regression analyses, to save degrees of freedom. A pre-analysis identified one multivariate outlier on the personality scales. Being an outlier was caused by an extremely low score on Agreeableness combined with a low score on Emotional stability. This combination of scores is present but rare in the Dutch population [21]. We decided to perform the analyses twice, i.e. with and without outlier, to get an indication of the outlier's effect on the personality/satisfaction relationship. One large principal component (50.2% explained variance) adequately summarized the shared variance in the satisfaction scales. The Big Five together explained a significant proportion of the variance (6%) in this component, $F(5, 231) = 2.68$, $P = 0.02$. A significant unique contribution came from Agreeableness ($\beta = 0.19$, $P < 0.01$) only.

Table 3 summarizes the results of the linear regressions of each of the 12 satisfaction scales and overall satisfaction on Agreeableness. Agreeableness explained significant proportions of the variance in satisfaction with medical care (7%), information (5%), recreation facilities (3%), miscellaneous aspects of care (4%), and overall hospital stay (5%). After controlling for age and educational level, the contribution of Agreeableness to patient satisfaction remained significant in patients' judgements of medical care (4% explained variance), information (5%), miscellaneous aspects (3%), and overall hospital stay (3%). After excluding the one multivariate outlier from the regression analyses, none of the contributions of Agreeableness remained significant.

Discussion

Typically, patient satisfaction is high, and satisfaction scales are correlated [10,11]. We found no unequivocal evidence that patients' personalities are involved in their judgements of care, which may have provided an explanation for correlations among their judgements, at least not personality traits as defined by the broad Big Five dimensions. In partial agreement with expectations, mainly Agreeableness appeared to be significantly associated with patient satisfaction, and even this variable explained a very modest amount of variance. Finding only a role for Agreeableness replicates previous findings [18]. After controlling for age and educational level, the contribution of Agreeableness shrank from a maximum of 7% (satisfaction with medical care) to a maximum of 5% (satisfaction with information). Moreover, when the one outlier was dropped from analysis, no significant explanatory power for Agreeableness was left. It means that, generally, Agreeableness does not seem to play an important role in patient satisfaction with care.

We found no secondary explanatory role for Emotional stability. This is understandable when taking into account that the primary role expected for Agreeableness was found to be minor already. Also expected associations with Extraversion, Conscientiousness, and Autonomy were not found present or to be very weak at best and to exist at the bivariate level only. Perhaps, then, satisfaction is generally high, and judgements correlated because they reflect the quality of care at a hospital

Table 2 Bivariate correlations between patient characteristics, personality, and patient satisfaction with hospital care

	1	2	3	4	5	6	7	8	9	10	11	12
<i>Patient characteristics</i>												
Gender	1											
Age	<i>-0.33</i>	1										
Education	0.03	<i>-0.17</i>	1									
Mother tongue	0.09	<i>-0.12</i>	0.01	1								
Expectations	<i>-0.06</i>	0.12	<i>-0.10</i>	0.01	1							
Self-rated health	0.10	<i>-0.23</i>	0.05	0.10	<i>-0.11</i>	1						
Length of hospital stay	<i>-0.04</i>	0.10	<i>-0.07</i>	0.04	0.02	<i>-0.20</i>	1					
<i>Personality</i>												
Extraversion	<i>0.22</i>	<i>-0.20</i>	<i>-0.04</i>	0.00	0.04	0.10	<i>-0.06</i>	1				
Agreeableness	<i>0.24</i>	<i>0.19</i>	<i>-0.15</i>	<i>-0.02</i>	0.04	<i>-0.07</i>	0.12	<i>-0.15</i>	1			
Conscientiousness	<i>-0.05</i>	<i>0.32</i>	<i>-0.10</i>	0.04	0.07	<i>-0.05</i>	<i>-0.04</i>	<i>-0.08</i>	0.07	1		
Emotional stability	<i>-0.28</i>	<i>0.19</i>	<i>-0.02</i>	<i>-0.18</i>	0.06	0.06	<i>-0.03</i>	<i>-0.01</i>	0.09	0.10	1	
Autonomy	<i>-0.15</i>	<i>-0.07</i>	<i>0.34</i>	0.02	<i>-0.06</i>	<i>-0.11</i>	<i>-0.06</i>	0.02	<i>-0.19</i>	<i>-0.17</i>	<i>-0.14</i>	1
<i>Satisfaction</i>												
Admission procedures	<i>-0.04</i>	<i>0.17</i>	<i>-0.18</i>	0.06	<i>0.36</i>	<i>0.18</i>	<i>-0.07</i>	0.07	<i>0.12</i>	<i>0.13</i>	0.01	<i>-0.13</i>
Nursing care	<i>-0.03</i>	<i>0.15</i>	<i>-0.04</i>	0.11	<i>0.40</i>	0.09	0.07	<i>-0.04</i>	<i>0.15</i>	0.08	0.04	<i>-0.05</i>
Medical care	<i>-0.01</i>	<i>0.28</i>	<i>-0.18</i>	0.00	<i>0.36</i>	0.03	0.11	<i>-0.06</i>	<i>0.25</i>	0.08	0.10	<i>-0.16</i>
Other disciplines	<i>-0.05</i>	<i>0.19</i>	<i>-0.04</i>	0.02	<i>0.22</i>	<i>0.14</i>	<i>-0.07</i>	0.07	0.03	<i>0.12</i>	<i>0.11</i>	0.01
Information	0.02	0.08	<i>-0.04</i>	0.10	<i>0.30</i>	<i>0.15</i>	0.07	0.08	<i>0.21</i>	0.00	0.08	<i>-0.10</i>
Patient autonomy	<i>-0.06</i>	0.02	0.01	0.02	<i>0.31</i>	<i>0.18</i>	0.05	0.06	0.02	0.04	0.10	0.01
Emotional support	0.01	<i>-0.05</i>	<i>-0.03</i>	0.12	<i>0.25</i>	<i>0.20</i>	0.10	0.08	<i>0.12</i>	<i>-0.04</i>	<i>-0.03</i>	<i>-0.08</i>
Hotel aspects of care	<i>-0.07</i>	<i>0.18</i>	<i>-0.12</i>	0.04	<i>0.23</i>	<i>0.15</i>	<i>-0.01</i>	0.02	<i>0.13</i>	<i>0.11</i>	<i>0.11</i>	<i>-0.11</i>
Recreation facilities	0.08	0.08	<i>-0.03</i>	0.11	<i>0.21</i>	<i>0.18</i>	<i>-0.02</i>	0.05	<i>0.16</i>	0.06	0.07	<i>-0.10</i>
Miscellaneous aspects	<i>-0.01</i>	0.08	<i>-0.05</i>	0.03	<i>0.28</i>	<i>0.20</i>	0.04	0.09	<i>0.19</i>	<i>-0.07</i>	0.10	0.01
Ease of access	<i>-0.02</i>	0.08	<i>-0.11</i>	<i>-0.08</i>	<i>0.17</i>	0.08	0.02	<i>-0.07</i>	0.10	<i>-0.01</i>	<i>0.12</i>	0.08
Discharge and aftercare	<i>-0.05</i>	<i>0.20</i>	<i>-0.12</i>	0.03	<i>0.34</i>	<i>0.14</i>	0.09	<i>0.11</i>	<i>0.14</i>	0.00	0.08	<i>-0.08</i>
Overall hospital stay	<i>-0.05</i>	<i>0.23</i>	<i>-0.16</i>	0.02	<i>0.50</i>	<i>0.13</i>	0.03	0.04	<i>0.21</i>	0.08	0.08	<i>-0.11</i>

$N = 237$. Correlations significant at the 0.05 level (one-tailed if the direction is known; otherwise two-tailed) are printed in italics.

level: quality standards that are maintained hospital wide. This supposition is supported by evidence that patients discriminate reliably among aspects of care, and patients' ratings are valid for monitoring care quality and identifying those aspects of care that may need quality improvement [22]. However, definite conclusions cannot yet be drawn. The Big Five are broad dimensions, and the model is not without critics [28]. There may be other, and more specific, personality traits that have more explanatory power [29]. So, further—preferably systematic—research is needed, i.e. guided by well-established (alternative) personality models. To begin with, one may wish to examine lower-level facets of Agreeableness [13,18], but also a potential role for response tendencies like acquiescence requires examination. Acquiescence is known to constitute a common component inflating correlations between scales.

In addition, the relationship between personality and expectations needs further exploration at lower-facet levels of personality. Like others, we found patients' expectations substantially associated with patient satisfaction [4,30]. Because this variable was not associated with the Big Five, which may suggest that expectations are state

like, not trait like, we excluded it (and self-rated health) from the regression analyses. Still, it remains an important question whether and how having (not) met patients' expectations invalidates their judgements of quality of care [30]. Another question is, whether using a different format in satisfaction surveys (e.g. 'How often . . .') makes a difference in this respect.

Do limitations of our data compromise our findings? The FFPI was found to be factorially valid in this patient sample (results not presented here). But relatively few patients completed the FFPI. This may have been due to the two-step procedure the hospital management instructed us to follow. Low response rate is associated with selection bias, which may have its effects on scale means and variances. In correlation analysis, a possible bias in means does not alter observed relationships, if the sample is sufficiently large for results to be stable and *variances* are not heavily influenced due to restriction of range. With $n = 237$, the condition of sample size is fulfilled. Therefore, our main concern was limited variance. We observed no large differences in the satisfaction scale variances (nor means) between the total sample and the subsample who completed the FFPI. Also,

Table 3 Regression of patient satisfaction on Agreeableness, with and without controlling for age and educational level

Patient satisfaction	Age, educational level, and Agreeableness					
	Agreeableness		Age and education		Agreeableness	
	R^2	P	R^2	P	R^2 change	P
Admission procedures	0.02	0.055	0.05	0.002 ¹	0.01	0.222
Nursing care	0.02	0.022	0.03	0.054	0.02	0.058
Medical care	0.07	<0.001 ¹	0.11	<0.001 ¹	0.04	0.002 ¹
Other disciplines	<0.01	0.574	0.05	0.006 ¹	0.00	1.000
Information	0.05	0.001 ¹	0.01	0.294	0.05	0.001 ¹
Patient autonomy	<0.01	0.560	<0.01	0.811	<0.01	0.601
Emotional support	0.02	0.037	<0.01	0.750	0.02	0.029
Hotel aspects of care	0.02	0.035	0.05	0.003 ¹	<0.01	0.145
Recreation facilities	0.03	0.008 ¹	0.01	0.252	0.03	0.018
Miscellaneous aspects	0.04	0.003 ¹	0.01	0.273	0.03	0.007 ¹
Ease of access	0.01	0.082	0.02	0.158	<0.01	0.169
Discharge and aftercare	0.03	0.014	0.05	0.002 ¹	0.01	0.071
Overall rating of hospital care	0.05	0.001 ¹	0.07	<0.001 ¹	0.03	0.006 ¹

$N = 227$.

¹Significant at family-wise $\alpha = 0.10$.

we observed no restriction of range in the variability of patients' Big Five scores. Finally, all the personality scales and the majority of the satisfaction scales were sufficiently reliable ($\alpha \geq 0.72$), which would not have been the case with insufficient variance in the item responses. We think it therefore unlikely that existing associations between these personality variables and patient satisfaction in the population were not found in our sample, due to restriction of range.

Conclusions

If patient (dis)satisfaction is to become an established and effective part of a hospital care quality monitoring and improvement program, hospital staff need to be convinced that patients' ratings of their hospital stay genuinely reflect patients' experiences. According to our findings, patients' personalities do not seem an important source of bias. But further studies are needed to examine whether findings are replicated across other models and instruments and whether they also hold at lower (facet) levels of personality.

Acknowledgements

This research was funded by the Board of Directors of the Academic Medical Center (AMC) at the University of Amsterdam, Amsterdam, The Netherlands. The authors thank Frans J. Oort and Jürg Schmid for their comments on an earlier draft of this article.

References

- Arnetz JE, Arnetz BB. The development and application of a patient satisfaction measurement system for hospital-wide quality improvement. *Int J Qual Health Care* 1996; **8**: 555–566.
- Davis SL, Adams-Greenly M. Integrating patient satisfaction with a quality improvement program. *J Nurs Adm* 1994; **24**: 28–31.
- Drachman DA. Benchmarking patient satisfaction at academic health centers. *Jt Comm J Qual Improv* 1996; **22**: 359–367.
- Abramowitz S, Coté AA, Berry E. Analyzing patient satisfaction: a multianalytic approach. *Qual Rev Bull* 1987; **4**: 122–130.
- Hall JA, Dornan MC. Patient sociodemographic characteristics as predictors of satisfaction with medical care: a meta-analysis. *Soc Sci Med* 1990; **30**: 811–818.
- Hall JA, Feldstein M, Fretwell MD, Rowe JW, Epstein AM. Older patients' health status and satisfaction with medical care in an HMO population. *Med Care* 1990; **28**: 261–270.
- Lewis JR. Patient views on quality care in general practice: literature review. *Soc Sci Med* 1994; **39**: 655–670.
- Nelson EC, Larson C. Patients' good and bad surprises: how do they relate to overall patient satisfaction? *Qual Rev Bull* 1993; **3**: 89–94.
- Nguyen Thi PL, Briançon S, Empereur F, Guillemin F. Factors determining inpatient satisfaction with care. *Soc Sci Med* 2002; **54**: 493–504.
- Visser AP. *The Experience of Staying in Hospital* (in Dutch). Assen: Van Gorcum, 1984.
- Rubin HR, Ware JE Jr, Hays RD. The PJHQ questionnaire: exploratory factor analysis and empirical scale construction. *Med Care* 1990; **28**: S22–S29.

12. Soldz S, Vaillant GE. The Big Five personality traits and the life course: a 45-year longitudinal study. *J Res Pers* 1999; **33**: 208–232.
13. Breemhaar B, Visser AP, Kleijnen JGVM. Perceptions and behaviour among elderly hospital patients: description and explanation of age differences in satisfaction, knowledge, emotions and behaviour. *Soc Sci Med* 1990; **31**: 1377–1385.
14. Shaw WS, Cronan TA, Lee RE, Kaplan RM. Health care satisfaction among osteoarthritis sufferers. *Psychol Health* 1996; **11**: 395–409.
15. Digman JM. Personality structure: emergence of the five-factor model. In Rosenzweig MR, Porter LW, eds. *Annual Review of Psychology*. Palo Alto, CA: Annual Reviews, 1990: 417–440.
16. De Raad B, Van Heck GL, eds. The fifth of the big five. Special issue. *Eur J Pers* 1994; **8**: 225–356.
17. Finlay PM, Atkinson JM, Moos KF. Orthognathic surgery: patient expectations; psychological profile and satisfaction with outcome. *Br J Oral Maxillofac Surg* 1995; **33**: 9–14.
18. Serber ER, Cronan TA, Walen HR. Predictors of patient satisfaction and health care costs for patients with fibromyalgia. *Psychol Health* 2003; **18**: 771–787.
19. Hofstee WKB, De Raad B, Goldberg LR. Integration of the Big Five and circumplex approaches to trait structure. *J Pers Soc Psychol* 1992; **63**: 146–163.
20. Goldberg LR, Sweeney D, Merenda PF, Hughes JE Jr. Demographic variables and personality: the effects of gender, age, education, and ethnic/racial status on self-descriptions of personality attributes. *PAID* 1998; **24**: 393–403.
21. Hendriks AAJ, Hofstee WKB, De Raad B. *The Five-Factor Personality Inventory (FFPI), Professional Manual* (in Dutch). Lisse: Swets Test Publishers, 1999.
22. Hendriks AAJ, Oort FJ, Vrieling MR, Smets EMA. Reliability and validity of the Satisfaction with Hospital Care Questionnaire. *Int J Qual Health Care* 2002; **14**: 471–482.
23. Hendriks AAJ, Vrieling MR, Smets EMA, Van Es SQ, De Haes JCJM. Improving the assessment of (in)patients satisfaction with hospital care. *Med Care* 2001; **39**: 270–283.
24. Hendriks AAJ, Vrieling MR, Van Es SQ, De Haes JCJM, Smets EMA. Assessing inpatients' satisfaction with hospital care: should we prefer evaluation or satisfaction ratings? *Patient Educ Couns* 2004; **55**: 142–146.
25. Hendriks AAJ, Perugini M, Angleitner A et al. The Five-Factor Personality Inventory: cross-cultural generalizability across 13 countries. *Eur J Pers* 2003; **17**: 347–373.
26. Hochberg Y, Benjamini Y. More powerful procedures for multiple significance testing. *Stat Med* 1990; **9**: 811–818.
27. Tabachnick BG, Fidell LS. *Using Multivariate Statistics*. Needham Heights, MA: Allyn & Bacon, 2001; 65–71, 92–98.
28. Block J. A contrarian view of the five-factor approach to personality description. *Psychol Bull* 1995; **117**: 187–215.
29. Paunonen SV, Ashton MC. Big Five factors and facets and the prediction of behavior. *J Pers Soc Psychol* 2001; **81**: 524–539.
30. Sitzia J, Wood N. Patient satisfaction: a review of issues and concepts. *Soc Sci Med* 1997; **45**: 1829–1843.

Accepted for publication 12 January 2006