

Exploring the impact of staff absenteeism on patient satisfaction using routine databases in a university hospital

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Aim To explore the influence of staff absenteeism on patient satisfaction using the indicators available in management reports.

Background Among factors explaining patient satisfaction, human resource indicators have been studied widely in terms of burnout or job satisfaction, but there have not been many studies related to absenteeism indicators.

Method A multilevel analysis was conducted using two routinely compiled databases from 2010 in the clinical departments of a university hospital (France). The staff database monitored absenteeism for short-term medical reasons (5 days or less), non-medical reasons and absences starting at the weekend. The patient satisfaction database was established at the time of discharge.

Results Patient satisfaction related to relationships with staff was significantly and negatively correlated with nurse absenteeism for non-medical reasons ($P < 0.05$) and with nurse absenteeism starting at weekends ($P < 0.05$). Patient satisfaction related to the hospital environment was significantly and negatively correlated with nurse assistant absenteeism for short-term medical reasons ($P < 0.05$).

Conclusion Our findings seem to indicate that patient satisfaction is linked to staff absenteeism and should lead to a better understanding of the impact of human resources on patient satisfaction.

Implications for nursing management To enhance patient satisfaction, managers need to find a way to reduce staff absenteeism, in order to avoid burnout and to improve the atmosphere in the workplace.

Keywords: patient satisfaction, performance indicators, quality improvement, quality of care, staff absenteeism

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Introduction

Improving the performance of health-care facilities is a central theme for hospitals, whether for managers, health-care professionals or for patients (World

Health Organization 2000, Institute of Medicine 2001, National Health Service 2008). This involves an overall process targeting the quality and safety of care, and the development of indicators for institutional coordination and internal management purposes.

According to the Donabedian Model (Donabedian 1988), care quality indicators can be classified into three categories: structure, process and outcomes. For example, human resources and working conditions are considered to be indicators of the structure of care, while outcome indicators include the success of the treatment and the evaluation of patient satisfaction (PS).

Over the past 30 years, surveys of patient satisfaction, defined as how individuals judge the quality of the care that they receive, are considered to be global outcome indicators in the evaluation of the human aspects of care quality and hospital performance (Hendriks *et al.* 2001). These indicators have become a requirement of the political authorities in many countries, and have therefore been increasingly prominent in the literature on the quality of patient care (Donabedian 1988, Hendriks *et al.* 2002, Pettersen *et al.* 2004, Gonzalez *et al.* 2005). In France, alongside the annual national survey in place since 2011, the patient satisfaction questionnaire at discharge is used extensively, providing hospitals with close, ongoing follow-up of the satisfaction of their patients based on a few questions. Among the different components of patient satisfaction, two major dimensions are generally seen as conditioning the quality of the patient–caregiver interaction – the medical information delivered by caregivers and the quality of relations with them (Ware & Berwick 1990, Moret *et al.* 2008). A large volume of research has documented the determinants of patient satisfaction (Crow *et al.* 2002). Most of the factors that have a recognised impact on patient satisfaction are linked to intrinsic patient-related factors (Crow *et al.* 2002, Nguyen Thi *et al.* 2002) such as the perceived state of health and sociodemographic characteristics. While they are essential when interpreting variations observed between patients, they nonetheless have the drawback of not being accessible to the implementation of improvement actions.

Literature review

Research on the impact of human resources on the quality of care and patient satisfaction is of greater interest in terms of potential improvement action. Numerous studies have explored the relationship between atmosphere in the workplace, job satisfaction among health-care professionals and the results of care (Aiken *et al.* 2001, Clarke *et al.* 2002). Aiken conducted a study to determine the association between increased workload and care safety: below a certain patient to nurse ratio, a single additional patient was

associated with a 7% increase in the likelihood of the patient dying within 30 days of admission (Aiken *et al.* 2002). In the same way, Magnet™ hospitals in North America, ‘where it is good to work and good to receive care’ and characterised by a lower nursing staff turnover and greater job satisfaction, exhibit better results of care, with higher patient satisfaction and lower mortality (Kramer & Schmalenberg 2005, Trinkoff *et al.* 2010). The direct relationship between absenteeism and care quality was explored by Unruh *et al.* (2007): this study showed that absenteeism in conjunction with a heavy workload seems to lead to a significant increase in adverse events. Teng *et al.* (2010) showed that patient safety is particularly affected when workload is associated with staff burn-out. Overworked nurses are more tired and find it harder to cope with pressure when there are extra efforts to be made. Vahey *et al.* (2004) have shown the existence of a relationship between burnout among nurses and poor patient satisfaction. Thus, the results of a survey among patients and nurses indicated that, in facilities that were described by professionals as having sufficient staff and in which relations between doctors and nurses were good, patients were more likely to report that they were satisfied with their care (Vahey *et al.* 2004).

To our knowledge, very little research has set out to explore the direct role of staff absenteeism on patient satisfaction scores. Our team conducted an exploratory study in 2008 on data compiled in 25 public and private facilities, using the Performance Assessment Tool for Quality Improvement in Hospitals developed by the World Health Organization Regional Office for Europe (WHO-PATH) (Moret *et al.* 2012). The results showed a negative correlation between nurse absenteeism (i.e. overall absenteeism of nurses) and patient satisfaction. However, the data were not compiled over the same time period and the project was not specifically designed to study that specific correlation. Another study was thus needed to test this correlation.

Objective

The purpose of this work was to study the correlation of registered nurse (RN) and nurse assistant (NA) absenteeism on inpatient satisfaction with quality of care, utilising routinely accessible databases in clinical department quality management reports. The goal was to explore the possibility of using these conventional, routinely collected indicators in a study and opportunities to increase managers’ awareness of the importance of these indicators.

Methods

Study design

A retrospective study on the data for 2010 was conducted in a university hospital in France. Data collection and statistical analysis were performed at the clinical department level. Human resource management and quality improvement policies were also constituted at this level. All the clinical departments, including Acute Care, Subacute Care and Rehabilitation were included ($n = 10$). They were characterised by the number of open beds at the end of 2010 and by the number of equivalent full-time RN and NA posts.

Two databases, that are continuously updated, were available for the purposes of the project. The first one was provided by the Human Resources Department, and contained absenteeism data for the RN (including specialised nurses) and NA from each department, covering the period from 01/01/2010 to 31/12/2010 (respectively 1443.9 equivalent full-time posts for RN and 1288.2 equivalent full-time posts for NA). In France, a nurse assistant is a person trained in basic nursing techniques and direct patient care who practises under the supervision of a registered nurse.

The second database was provided by the Users, Risks and Quality Department. This included patient satisfaction data compiled at the time of discharge in the patient satisfaction questionnaire, for the same period of time ($n = 2188$).

Indicators for absenteeism among registered nurses and nurse assistants

Overall staff absenteeism was defined as a failure on the part of the staff to be present in accordance with planned duty hours. The rate of absenteeism was defined as follows:

The sum of days off work for all reasons in the year 2010 multiplied by 100 and divided by the number of equivalent full-time posts on the payroll, multiplied by 365 days.

The number of equivalent full-time posts for RN and NA staff was determined by calculating monthly RN and NA staffing during the course of the year.

Overall absenteeism data available for RN and NA staff were divided into two parts:

- absenteeism for medical reasons, including common types of illness and absenteeism due to commuting or occupational injuries,
- absenteeism for non-medical reasons, including maternity and training.

Another indicator was defined as short-term (5 days or less) absenteeism for medical reasons.

An additional indicator, the 'number of absences starting on Friday, Saturday or Sunday' was available for RN and NA staff in the database.

All qualified RN and NA in permanent posts were included.

Satisfaction indicators

The regular hospital patient satisfaction questionnaire was composed of 20 items routinely collected at the time of discharge. The annual mean overall return rate was 6.5%. The questionnaire was composed of three dimensions from two French-language validated scales (Moret *et al.* 2007, French Ministry of Health 2011): two from the EQS-H scale ('*Echelle de qualité des soins des patients hospitalisés*') and one from the I-SATIS questionnaire ('*Indicateur de satisfaction des patients hospitalisés*'). The EQS-H scale comprises 16 items divided between two dimensions: clarity of medical information provided (eight items) and relationships with health-care staff (eight items). The eight items of the 'clarity of medical information' dimension were as follows: 'I received clear information about' the symptoms, the purpose of the tests, the results of the tests, the purpose of the treatments, the possible side-effects of these treatments, the warning signs to look for, when to resume activities after discharge and the medical follow-up. The eight items of the 'relationships with health-care staff' dimension were as follows: I could identify the doctor in charge of me; there was enough privacy during medical care; I received enough help in my daily routine; everything possible was done to relieve my pain; I saw nurses as often as I wished; there was good co-ordination in the department; there was a good atmosphere in the department; the nursing staff was fully available. The validation study on this scale showed excellent validity and reliability: the first two factors accounted for 66% of the variance, and Cronbach's alpha coefficient for the overall scale was 0.95. A confirmation study was conducted, and similar psychometric properties were found.

The I-SATIS questionnaire is the new (it has been implemented in 2011) standardised questionnaire used annually by the French Ministry of Health for the national patient satisfaction survey. It comprises 33 items in six dimensions (Overall patient care, Patient information, Communication with caregivers, Health professionals' attitudes, Hospital catering, Hospital environment). The 'hospital environment' dimension comprises four items relating to room comfort, cleanliness, room temperature and background noise.

The two scales have five response choices, 'poor', 'average', 'good', 'very good' and 'excellent', respectively, rated 0, 25, 50, 75–100, with higher values corresponding to greater satisfaction. Individual scores were calculated for all patients responding to at least half the items plus one in a dimension. The scores were calculated by summing responses to items and then dividing by the number of items completed. The mean score for a dimension was the sum of individual scores divided by the number of respondents concerned. The satisfaction scores were then reported on a scale from 0 to 100 using the cross-multiplication method.

The three satisfaction scores were adjusted for patient age, considering the patient age variable as a non-linear factor with a threshold at 65 years (Moret *et al.* 2007), gender, circumstances of admission (i.e. scheduled as opposed to arrival via the emergency department), perceived degree of improvement in health following hospitalisation (i.e. none, slight or considerable) and general satisfaction with life, rated from 1 (=lowest) to 7 (=highest) (Nguyen Thi *et al.* 2002).

Statistical analysis

Univariate descriptive statistics

To describe the characteristics of the sample, frequencies, means, standard deviation and range were calculated. Inter-item correlations and correlations between each item and the scores were determined using Pearson's correlation coefficients.

Multivariate statistics using a mixed linear model

The patient observations were grouped into clusters of departments. A mixed linear model was constructed to take into account the hierarchical structure of the data and the department effect.

The analysis consisted in applying three successive models:

- A model without covariables providing a general mean satisfaction score, and the proportions of inter- and intra-department variance in patient satisfaction.
- A model with patient-associated covariables to determine the extent to which patient-related variables explained the variations observed across patient satisfaction scores.
- A final model including all the variables to study the influence of absenteeism variables on patient satisfaction.

The following patient-related variables were included in the model: patient age modelled in two linear functions with a threshold at 65 years, circumstances of

admission, their degree of satisfaction in relation to life in general and perceived improvement in health. With respect to the department-related variables, only those significantly correlated with the mean satisfaction scores in a department were studied. The model parameters were estimated using the restricted maximum likelihood method. The models were compared using the Bayesian Information Criteria (BIC). The model with the lower value of BIC is the one to be preferred. The level of significance for all the statistical tests was set at $P < 0.05$. The analyses were performed with R 2.11.1 Software.

Results

Description of RN and NA absenteeism

The mean age of the staff was, respectively, 37.2 years (± 9.7) for the RN and 37.4 years (± 10.7) for the NA; 90.7% of the RN and 91.1% of the NA were women. The overall rate of absenteeism, regardless of the reasons, was 9.0% for RN staff and 10.9% for NA staff (Table 1). The rate of RN absenteeism for medical reasons accounted for 50.6% of the absenteeism, while it accounted for 66.5% for the NA staff. This absenteeism was mostly explained by absenteeism due to illness (92.7% of absenteeism on medical reasons for RN and 87.9% for NA). The remainder was explained by occupational and commuting injuries, and occupational illnesses. Maternity and training reasons accounted for almost all the absenteeism for non-medical reasons (80.0 and 15.0% for RN, and 81.9 and 9.5% for NA, respectively).

Description of patients

In the ten clinical departments, 2188 patients responded to the satisfaction questionnaire. The mean age of the respondents was 54.2 years (± 18.0). Forty-one percent of respondents were men. More results are presented in Table 2.

Mean satisfaction scores varied from 60.4 (± 20.4) for hospital environment, to 67.4 (± 20.5) for clarity of medical information provided and 76.5 (± 18.7) for relationship with health-care staff. These scores differed significantly between clinical departments (respectively $P < 0.001$; $P < 0.05$ and $P < 0.01$).

Relationship between inpatient satisfaction scores and health-care staff absenteeism

Univariate analysis

The rate of RN absenteeism for non-medical reasons was negatively correlated with the mean satisfaction

Table 1
Rates of absenteeism indicators for the RN and NA in 2010

	%	SD
Registered Nurses (<i>n</i> = 1443.9 equivalent full-time posts)		
Overall staff absenteeism	9.04	1.75
Absenteeism for medical reasons	4.54	1.03
Absenteeism for non medical reasons	4.50	0.81
Mean number of absences starting on Friday, Saturday or Sunday	2.09	0.44
Short-term absenteeism for medical reasons (5 days or less)	0.34	0.11
Nurse assistants (<i>n</i> = 1288.2 equivalent full-time posts)		
Overall staff absenteeism	10.90	2.47
Absenteeism for medical reasons	7.29	1.84
Absenteeism for non medical reasons	3.61	0.85
Mean number of absences starting on Friday, Saturday or Sunday	2.46	0.48
Short-term absenteeism for medical reasons (5 days or less)	0.51	0.09

Table 2
Characteristics of inpatients

Age (years) (<i>n</i> = 2188)	
Mean ± SD	54.2 ± 18.0
≤65 years (%)	70.0
>65 years (%)	30.0
Gender (<i>n</i> = 2165)	
Male (<i>n</i> and %)	898 (41.5)
Female (<i>n</i> and %)	1267 (58.5)
Circumstances of admission (<i>n</i> = 2032)	
Scheduled hospitalisation (%)	70.6
Perceived degree of improvement in health following hospitalisation (<i>n</i> = 1779)	
None (%)	8.2
Slight (%)	36.0
Considerable (%)	55.8
General satisfaction with life (<i>n</i> = 1999)	
Mean ± SD (from 1 = lowest to 7 = highest)	5.7 ± 1.4

score for the relationship with health-care staff in a department ($R = -0.68$, $P < 0.05$); the same applied for the number of absences starting at weekends for RN ($R = -0.71$, $P < 0.05$).

The higher the rate of NA absenteeism for short-term medical reasons of 5 days or less, the lower was the satisfaction score associated with the hospital environment ($R = -0.73$, $P < 0.05$) (Table 3).

Multivariate analysis with a mixed linear model

Firstly, the model without covariables evidenced significant differences across the mean satisfaction scores for departments ($P < 0.001$). The level of inter-

department variance was about 1% of the total variation, the remainder being attributable to inter-patient variations.

Secondly, the model including patient-related covariables showed that, for each aspect of patient satisfaction studied, patients hospitalised via scheduled admission had significantly higher scores than those admitted via the emergency department ($P < 0.001$). Likewise, satisfaction scores increased according to perceived general satisfaction with life or perceived marked improvement in health ($P < 0.001$). The RN and NA results revealed a difference according to the patient's age (respectively, no relationship and significant association). Lastly, in the overall model, after adjusting for confounding factors associated with the departments and patients, the mean satisfaction score for relationships with health-care staff was significantly and negatively correlated with the number of absences starting at weekends for RN staff ($P < 0.05$) (Table 4) and RN absenteeism on non-medical reasons ($P < 0.05$) (detailed results not shown).

The mean satisfaction score with the hospital environment was significantly correlated with the rate of NA absenteeism for routine illness of 5 days and less ($P < 0.05$) (Table 5): the higher this rate of absenteeism, the lower the satisfaction score. The inclusion of this variable explained 71% of the inter-department variance.

There was, however, no significant correlation between the satisfaction score concerning medical information provided and staff absenteeism indicators.

Discussion

The results obtained from this work denote the existence of a significant negative link between patient satisfaction and health-care staff absenteeism. Moreover, these results highlight that, even with routinely collected databases, it was possible to establish a correlation between patient satisfaction and absenteeism indicators.

Firstly, RN absenteeism seems to have a negative impact on patient satisfaction with regard to relationships with health-care staff. These results confirm those previously reported by our team (Moret *et al.* 2012). In the literature, the link between RN absenteeism and patient satisfaction has not been studied directly. Nonetheless, the influence of a number of human resource indicators on the various components of patient satisfaction has been shown, clearly indicating the impact of the management context of the hospital. Vahey (Vahey *et al.* 2004) explored the link

Table 3

Correlations between absenteeism indicators and PS scores

	Clarity of medical information score ρ (<i>P</i> -value)	Relationships with health-care staff score ρ (<i>P</i> -value)	Hospital environment score ρ (<i>P</i> -value)
Nurse			
Overall staff absenteeism	-0.09 (NS)	-0.55 (NS)	0.06 (NS)
Absenteeism for medical reasons	0.14 (NS)	-0.40 (NS)	0.17 (NS)
Absenteeism for non medical reasons	-0.39 (NS)	-0.68 (*)	-0.08 (NS)
Mean number of absences starting on Friday, Saturday or Sunday	-0.41 (NS)	-0.71 (*)	-0.45 (NS)
Nurse assistants			
Overall staff absenteeism	-0.34 (NS)	-0.37 (NS)	-0.44 (NS)
Absenteeism for medical reasons	-0.16 (NS)	-0.29 (NS)	-0.34 (NS)
Absenteeism for non medical reasons	-0.62 (NS)	-0.33 (NS)	-0.54 (NS)
Mean number of absences starting on Friday, Saturday or Sunday	-0.43 (NS)	-0.27 (NS)	-0.52 (NS)
Short-term absenteeism for medical reasons (5 days or less)	-0.03 (NS)	0.38 (NS)	-0.09 (NS)
Short-term absenteeism for medical reasons (5 days or less)	-0.22 (NS)	-0.12 (NS)	-0.73 (*)

NS, Not significant, **P* < 0.05.**Table 4**

Correlation between patient satisfaction score for the relationship with health-care staff and the mean number of absences starting on Friday, Saturday and Sunday for RN staff: mixed linear model

Dependent variable	Model without covariables			'Patient' model			'Department' model		
	Coefficient	SD	<i>P</i> -value	Coefficient	SD	<i>P</i> -value	Coefficient	SD	<i>P</i> -value
Intercept	76.05	0.78	<0.001	79.16	2.62	<0.001	85.89	3.53	<0.001
Age <65 years (vs. age \geq 65 years)				-1.22	2.66	0.647	-0.94	2.66	0.723
Mean number of absences starting on Friday, Saturday and Sunday							-329.00	119.23	0.025
Age (years)				-0.09	0.12	0.438	-0.09	0.12	0.469
Age (years) * age <65 years				0.17	0.13	0.172	0.16	0.13	0.196
General satisfaction with life				2.68	0.32	<0.001	2.67	0.32	<0.001
Perceived degree of improvement in health following hospitalisation				9.20	0.93	<0.001	9.14	0.92	<0.001
Scheduled admission				6.09	0.98	<0.001	5.74	0.99	<0.001
Random effect (estimated variance)									
	Variance component	95% CI		Variance component	95% CI		Variance component	95% CI	
Inter-department residue	3.8	[0.8–17.2]		1.5	[0.1–14.8]		0.0	–	
Individual residue	346.5	[326.2–368.1]		297.9	[277.7–319.6]		297.7	[277.6–319.4]	
Coefficients									
Level of inter-department variance	1.09%			0.49%			0.00%		
Level of inter-department variance explained by inclusion of department-related variables				100.0%					
Bayesian Information Criteria (BIC)	18454.26			13448.02			13437.79		

between RN burnout and patient satisfaction and her findings are similar to ours. Kutney-Lee (Kutney-Lee *et al.* 2009) also showed that patient-to-nurse ratios seem to affect patient satisfaction. Indeed, high rates of RN absenteeism could be, among different reasons, consequences of job dissatisfaction, compounded by burnout, stress, lack of autonomy or poor team cohesion (Lu *et al.* 2005, Davey *et al.* 2009). Conversely,

the absence of cohesion and inconsistencies between physicians and nursing staff, and differences in their modes of expression towards the patient, often generate anxiety and stress (Chang *et al.* 2009).

In our study, RN absenteeism affecting the quality of health care concerned absences for non-medical reasons, including maternity leave and staff training. These absences are liable to disrupt the organisation

Table 5

Correlation between patient satisfaction scores for hospital environment and NA short-term (5 days or less) absenteeism for medical reasons: mixed linear model

Dependent variable	Model without covariables			'Patient' model			'Department' model		
	Coefficient	SD	P-value	Coefficient	SD	P-value	Coefficient	SD	P-value
Intercept	63.47	0.96	<0.001	61.78	3.01	<0.001	73.81	5.05	<0.001
Age <65 years (vs. age ≥65 years)				0.82	2.99	0.783	0.79	2.98	0.790
NA short-term absenteeism for medical reasons							-23.18	8.11	0.021
Age (years)				0.28	0.13	0.039	0.26	0.13	0.054
Age (years) * age <65 years				-0.25	0.14	0.077	-0.23	0.14	0.104
General satisfaction with life				1.78	0.36	<0.001	1.78	0.36	<0.001
Perceived degree of improvement in health following hospitalisation				8.00	1.05	<0.001	7.96	1.05	<0.001
Scheduled admission				5.67	1.13	<0.001	5.86	1.11	<0.001
Random effect (estimated variance)	Variance component	95% CI		Variance component	95% CI		Variance component	95% CI	
Inter-department residue	6.6	[2.0–22.3]		5.7	[1.4–23.8]		1.7	[0.1–21.2]	
Individual residue	410.8	[386.9–436.3]		381.5	[355.6–409.4]		381.7	[355.8–409.5]	
Coefficients									
Level of inter-department variance	1.59%			1.47%			0.43%		
Level of inter-department variance explained by inclusion of department-related variables				70.9%					
Bayesian Information Criteria (BIC)	18977.1			13830.5			13826.1		

of work shifts, but can be considered as predictable absences, which could therefore be anticipated.

However, the same results concerned absences starting at the weekend, for various reasons. These absences are disruptive, because they cannot be anticipated and cause additional work, and liable to deteriorate working conditions for the remaining RN. A high level or an increased level of weekend absenteeism in certain departments is certainly a job satisfaction indicator that should be taken into account by management. In fact, staff absenteeism generates discontinuity in care and appears to impact the quality of care provided to patients (Aiken *et al.* 2002). Unruh *et al.* (2007) suggested that staff absenteeism may be a part of a vicious cycle in which low staffing contributes to unit absenteeism, which in turn contributes to low staffing, and so on. These elements end up lowering the quality of care.

Secondly, although many studies focus on RN, our results, concerning the impact of NA absenteeism on patient satisfaction, are more original. Our results show that when NA absenteeism for medical reasons increased, patient satisfaction related to hospital environment decreased. This result gives greater importance to the role of NA in global patient care.

On the other hand, our results did not evidence any correlation between RN or NA related human resource indicators and patient satisfaction indicators concerning clarity of medical information provided.

This aspect of patient satisfaction appears to be subject to a significant individual component, giving rise to considerable intra-department variability, closely dependent on the patient–care provider relationship. Patient satisfaction concerning the clarity of medical information provided is perhaps more dependent on a clearer definition of the specific roles of the various health-care providers, in particular physicians (Moret *et al.* 2008), than on clinical department parameters.

Limitations of the study

Despite these encouraging results, this research is subject to considerable limitations and bias, particularly as a result of the specific design of this study, based on the use of indicators compiled retrospectively from existing databases.

Firstly, two selection biases could affect the quality of the results. The most important relates to patients who fail to respond to the patient satisfaction questionnaire at discharge. Indeed, the lack of specific data to determine their profile means that it is not possible to make any assumptions as to the representative nature of the inpatient sample. The patient satisfaction questionnaire at discharge is subject to criticism because of the low return rates (between 4 and 18% depending on studies (Gerbaud *et al.* 2002)) and the inadequate representativeness of the responses to

reflect the overall inpatient population. Nevertheless, some publications indicate that satisfaction rates do not differ between respondents and non-respondents (Gasquet *et al.* 2001).

A second selection bias, more closely linked with patient inclusion criteria, could also have affected the results, although to a lesser extent. The data compiled did not enable precise follow-up of the results, particularly monthly results, for a number of reasons. First of all, the patient satisfaction data collection protocol at discharge was modified in early 2010, with the coexistence of two procedures for a number of months: a new standardised questionnaire (used for this study) and a non-standardised questionnaire. As a result, a significant proportion of the questionnaires were not included in this analysis; the calculation of the return rate was therefore affected and it was not possible to collate the monthly results.

In addition, the collection of satisfaction data via the patient satisfaction questionnaire at discharge may entail a classification bias. Indeed, with this questionnaire, patients are asked about their satisfaction with the course of their care during hospitalisation, which may involve professionals from different departments. However, each questionnaire only has one corresponding clinical department, identified by the patient.

The study of human resources indicators was conducted at department level, as this seemed to be the most suitable choice for studying health-care staff absenteeism, since posts are allocated at this level, with pooling of replacements at department level to compensate for staffing imbalances. Quality policy is also based at the department level, providing for the production of quality indicator reports including satisfaction data; patient satisfaction results are also based at this level. Nonetheless, if the human resources database had been more precise, a more detailed analysis of the data would have been possible.

Conclusion

Staff absenteeism is a growing management concern. It can contribute to understaffed units, staffing instability, poor continuity of care that could have a negative impact on patient care. Our study was the first to explore the direct influence of RN and NA absenteeism indicators on the quality of delivered care as defined by patient satisfaction measures. Our findings should lead to a better understanding of the impact of human resource indicators on patient satisfaction, in particular staff absenteeism, which could be markers

for a deterioration of the quality of care provided. Moreover, these indicators have the important advantage of being sensitive to improvement measures, unlike the factors classically taken into account in satisfaction surveys, such as age, gender or perceived health status.

Implications for nursing management

Since publications related to Magnet™ hospitals (Kramer & Schmalenberg 2005, Trinkoff *et al.* 2010) showing that hospitals where it is good to work are good to receive care, it seems that patients report greater satisfaction in better working environments (Kutney-Lee *et al.* 2009). To enhance the patient perception of care quality, nursing managers need to find a way to improve satisfaction among health-care professionals in the workplace, in order to reduce staff absenteeism. For example, targeting actions liable to enhance interprofessional collaboration and team cohesion seems to reduce job stress (Chang *et al.* 2009). Working on factors that reduce absenteeism will improve the continuity and quality of care (Davey *et al.* 2009). Low staffing has been demonstrated to have a significant effect on patient outcomes (Needleman *et al.* 2011). These elements reinforce the need to match sufficient resources and staffing to patient needs for quality and safety of care. The effectiveness of interventions to reduce absenteeism among RN and NA will no doubt largely depend on the ability of these interventions to increase the job satisfaction of these workers.

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Ethical approval

The research protocol was presented to the Committee for Hygiene, Safety and Working Conditions and was approved both by hospital managers and professional representatives. The results were then presented to the

hospital managers. According to legal advice, IRB approval was unnecessary.

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