

Structural characteristics of hospitals and nurse-reported care quality, work environment, burnout and leaving intentions

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Aim To investigate whether hospital characteristics not readily susceptible to change (i.e. hospital size, university status, and geographic location) are associated with specific self-reported nurse outcomes.

Background Research often focuses on factors within hospitals (e.g. work environment), which are susceptible to change, rather than on structural factors in their own right. However, numerous assumptions exist about the role of structural factors that may lead to a sense of pessimism and undermine efforts at constructive change.

Method Data was derived from survey questions on assessments of work environment and satisfaction, intention to leave, quality of care and burnout (measured by the Maslach Burnout Inventory), from a population-based sample of 11 000 registered nurses in Sweden. Mixed model regressions were used for analysis.

Result Registered nurses in small hospitals were slightly more likely to rank their working environment and quality of nursing care better than others. For example 23% of staff in small hospitals were very satisfied with the work environment compared with 20% in medium-sized hospitals and 21% in large hospitals. Registered nurses in urban areas, who intended to leave their job, were more likely to seek work in another hospital (38% vs. 32%).

Conclusion While some structural factors were related to nurse-reported outcomes in this large sample, the associations were small or of questionable importance.

Implications for nursing management The influence of structural factors such as hospital size on nurse-reported outcomes is small and unlikely to negate efforts to improve work environment.

Keywords: burnout, hospitals, nursing, work environment

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Introduction

When investigating registered nurses (RNs) self-reports of outcomes such as burnout, quality of care and

work environment, and their intention to leave either their current job or the nursing profession, previous research has tended to focus on factors ‘within’ hospital structures, which are susceptible to change (e.g. the

hospital care environment) (Aiken *et al.* 2008, Lucero *et al.* 2009, Patrician *et al.* 2010), staffing organisation (Adams & Bond 2000, McHugh & Lake 2010) or Magnet hospital characteristics (Laschinger *et al.* 2001, Flynn & McCarthy 2008, Chen & Johantgen 2010). Structural features of hospitals, which are not as readily altered, such as size, teaching status and location in rural or urban settings, are often used to characterize samples of nurses or are simply included as control variables in regression analyses rather than employed as putative explanatory variables of interest in their own right. Reviews related to job satisfaction, RN turnover and intention to leave have not tended to address structural features (Coomber & Barriball 2007, Utriainen & Kyngas 2009, Hayes *et al.* 2012). For example, in Utriainen and Kyngas' (2009) review of hospital nurse job satisfaction they conclude that satisfaction is related to 'internal factors and interpersonal aspects of nursing work', although they do not appear to consider external or structural features in their review. While Coomber and Barriball (2007) refer to an explanatory model that includes structural factors, their inclusion of the four themes most frequently addressed in the literature led to empirical exclusion of this area, and Hayes *et al.* (2012) mention external factors only in their discussion of important areas for future consideration. Kalisch *et al.* (2011) included hospital characteristics as a central feature of a model used to investigate nurse job satisfaction, but did not take this into consideration in their empirical study.

The limited research that uses structural hospital characteristics as explanatory variables has shown no association between nursing practice environments and size of either the hospital or community in which the hospital is situated (Lake & Friese 2006). In a study by Coward *et al.* (1992), job satisfaction among a sample of 731 staff with RN and other nursing backgrounds was studied in relation to hospital size. The study concluded that nursing staff in small rural hospitals (< 50 beds) were more satisfied with their jobs than those working in medium-sized hospitals in small towns (50–99 beds) and larger metropolitan institutions (> 100 beds). However, Baernholdt and Mark (2009) found, in their much larger study of 286 general medical/surgical nursing units in 146 hospitals in the USA, that rural/urban location was not associated with either job satisfaction or turnover rates among RNs.

This lack of literature is notable as, in our experience, there is a tendency for RNs and policymakers to express assumptions about the importance of

structural factors, which may lead to a sense of pessimism, thus undermining efforts at constructive change.

Aims

In this article we aim to investigate whether a number of hospital characteristics that are not readily susceptible to change are potentially important predictors in themselves. We do this by examining their relationship to a number of outcome variables reported by a national survey of over 11 000 RNs working in all acute care hospitals in Sweden.

Context of the study

Most health-care delivery in Sweden is provided under the auspices of a public health-care system, making it largely subject to government control. Sweden is divided into 21 health-care regions, each with responsibility for health-care services for their population. Health-care services are primarily financed by income taxes, with limited out-of-pocket costs for care recipients (OECD 2011). The overwhelming majority of hospitals are owned and operated by the regional authorities, with general hospitals serving each regional catchment area, and a limited number of regional/university hospitals providing more specialized services.

Three categories of nursing staff can be found in Swedish hospitals: RNs, practical or assistant nurses and nurse's aides. Assistant nurses have a 3-year upper secondary school education in a specialized vocational programme, whereas nurse's aides have usually undergone a shorter training programme, which can take different forms. Over recent decades, nurse's aides have increasingly been replaced by assistant nurses and the proportion of RNs has increased (Landstingsförbundet 2002). In 1982 the educational system for RNs went from being a non-academic (Polytech) education to a 2-year academic education. In 1993 the educational programme leading to RN licensure was lengthened to 3 years and since 2007 leads both to licensure as a RN and a baccalaureate degree (Raholm *et al.* 2010).

Materials and methods

The data presented here derived from the Swedish component of the European Commission 7th framework-funded RN4CAST project (RN4CAST Consortium 2009). The primary aim of RN4CAST was to introduce innovative workforce forecasting methods addressing not only volumes, but also characteristics

of both nursing staff and work environment, with attention given effects on patient care (Sermeus *et al.* 2011). The study consortium included research teams from 12 European countries, including Sweden, each using the same instruments to investigate the relationship between nurse workforce planning and patient outcomes in medical and surgical units within acute-care hospitals. In this study, we utilise data from the survey of RNs in Sweden described below.

Participants

The member register of the Swedish Association of Health Professionals was used as the basis for recruitment to the RN survey, after approval from the relevant Research Ethics committee (Regionala etikprövningsnämnden i Stockholm: Dnr 2009/1587-31/5). The register contains details of 81% of all active RNs in Sweden [Vårdförbundet (Swedish Association of Health Professionals) Pär Malmquist, personal correspondence February 1, 2011]. The member register consists of information on workplace, including both hospital and department, but does not hold further information on the RN's specific function or involvement in inpatient versus outpatient care. All RNs registered as working in medical or surgical departments were therefore selected ($N = 33\,083$) as the population for recruitment to the survey. A system of individually unique national registration numbers in Sweden allows record linkages between the union's database and a national register of residential addresses. The survey was administered by Statistics Sweden, a government agency with long experience of large-scale surveys.

The postal survey was distributed in February 2010 to the RNs' residential addresses, with the option of either returning it by prepaid mail or by completing a web-based version. Three reminders were sent: the first after 2 weeks, the second after 4 weeks and the third after 6 weeks. The last two reminders both contained a new printed survey. The return rate at the end of the data collection period was 69.8% ($n = 23\,087$).

The first survey question was formulated to establish if the respondent belonged to the study population (i.e. was working actively in direct inpatient medical or surgical acute care), and 10 121 RNs not meeting study criteria were excluded thereafter. The selection process is shown in detail in Figure 1. As the workplace is an essential characteristic for aggregation of data for analysis, the hospital and department reported in the union member database was printed on the survey for each individual respondent, with two control questions to ensure that this information

was currently correct and to allow for updating. Respondents with workplaces or with functions beyond the scope of inclusion criteria for the study were excluded ($n = 1951$). Internal attrition was 2–3% for most survey items.

An analysis of non-respondents based on known background factors (age, gender and workplace) was performed with no systematic non-response bias detected. As the study population included known over-recruitment (i.e. RNs not working with direct inpatient care), a separate analysis was performed to examine systematic differences in response rate between the study group (i.e. nurses working directly in inpatient care) and the over-recruitment group; no systematic differences between these groups were detected.

Survey questionnaires

The RN survey used here consists of a set of well-known and extensively-validated instruments and questions developed and tested in previous research, (Aiken *et al.* 2002, 2008) allowing measurement of the characteristics of the hospital RN workforce, RNs' future employment intentions and RNs' perspectives on quantity and quality of care (for more information see Sermeus *et al.* 2011). The survey questionnaire was the same in all the countries involved in RN4CAST and was translated from English to Dutch, Finnish, French, German, Greek, Italian, Norwegian, Polish, Spanish and Swedish. The translations were validated according to stringent processes and norms (Polit *et al.* 2007, Sermeus *et al.* 2011)). The content validity index of the Swedish translation was 0.91 (Polit *et al.* 2007, Squires *et al.* 2012).

The survey components presented in this study are described below (see also Table 1 for the wording of response alternatives of the original scales).

Work environment was assessed by two global questions (Waneous *et al.* 1997): 'How would you rate the work environment at your job in this hospital (such as adequacy of resources, relations with co-workers, support from supervisors)?' and 'Would you recommend your hospital to a nurse colleague as a good place to work?'. Work satisfaction was explored in a global question, 'How satisfied are you with your current job in this hospital?'. Intention to leave was assessed by one question: 'If possible, would you leave your current hospital within the next year as a result of job dissatisfaction?'. This was followed by a specification, 'If yes, what type of work would you seek?', with the response alternatives 'Nursing in another hospital',

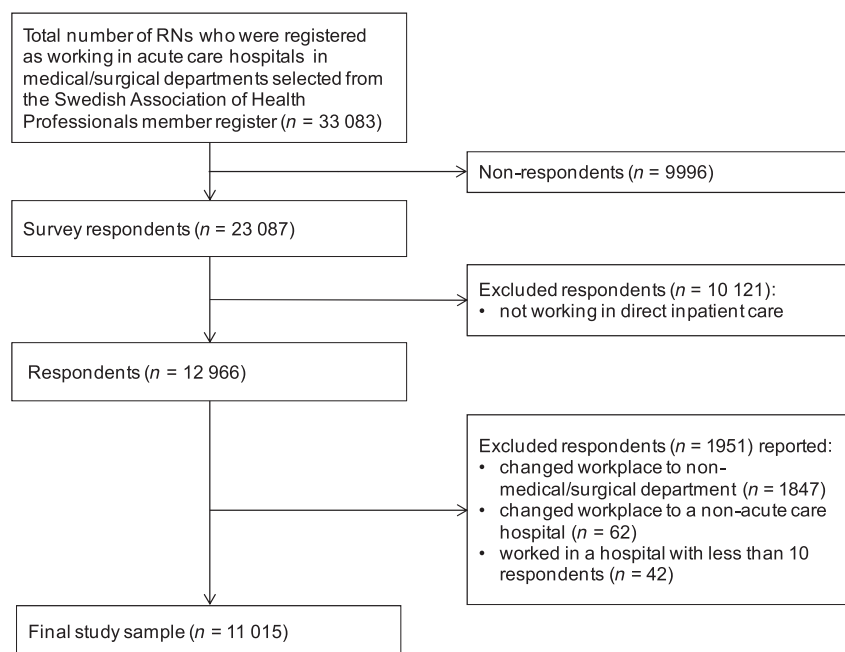


Figure 1
Selection of respondents. RN, regis-
tered nurse.

‘Nursing, but not in a hospital’ and ‘Non-nursing’. Quality of care was measured here using two global questions: ‘In general, how would you describe the quality of care delivered to your patients on your unit/ward?’ and ‘Would you recommend your hospital to your friends and family if they needed hospital care?’. The Maslach Burnout Inventory (MBI) includes 22 items and is widely used internationally for measuring work-related burnout. (Maslach *et al.* 1996) This version of the MBI was chosen for RN4CAST as it was translated and validated in many languages and captures three dimensions of burnout: emotional exhaustion, depersonalization, and personal accomplishment (Poghosyan *et al.* 2009). Each MBI dimension comprises of five to nine questions with seven response alternatives between 0 and 6. The respondent was asked to mark how frequently they had each feeling in relation to their current job in this hospital, with seven response alternatives, ranging from ‘Never’ to ‘Every day’. A higher score on each scale indicates a more negative rating. The total sum of each dimension was calculated giving the emotional exhaustion scale (nine items) a range of 0–54, the depersonalization scale (five items) a range of 0–30 and the personal accomplishment scale (eight items) a range of 0–48.

Variables of the study

The dependent variables were chosen because of their importance for recruiting and maintaining a nursing workforce. We examined the relationship between hospital characteristics: number of admissions per year

(size), population density areas (geographical location), university hospital status, and self-reported nurse outcomes (i.e. assessments of work environment and satisfaction), intention to leave current job, quality of care and levels of burnout.

Hospital size was determined by the number of admissions in 2009, and is categorized as follows: small hospitals, < 12 000 admissions/year (about 150 beds); medium hospitals > 12 000–30 000 admissions/year (about 150–400 beds); and large hospitals, > 30 000 admissions/year (> 400 beds). In Sweden, 10 of the 72 acute-care hospitals are university hospitals, geographically spread across the country. Geographical location was dichotomized into high-density population areas (> 500 000) and less dense areas. The three high-density population areas in Sweden each have more than one hospital in the area.

Analysis

Scale means and proportions were calculated on each subgroup of hospital characteristics. Differences in proportions were analysed using the chi-square test, differences in ordinal scale items were analysed using the Mann–Whitney *U*-test and differences in ratio scale were tested using the Students *t*-test.

Linear regression was used to determine effects of hospital characteristics on the selected ratio scale outcome variables (MBI). Ordinal scale items were dichotomized into dissatisfied *vs.* satisfied, yes *vs.* no and poor/fair *vs.* good/excellent. These dichotomous outcome variables and intention to leave were

Table 1

Descriptive statistics of work satisfaction/work environment, intention to leave and quality of care

	Hospital size						University hospital status			Hospitals in high population density areas		
	Small (%)	Medium (%)	Large (%)	P			Yes (%)	No (%)	P	Yes (%)	No (%)	P
				Small vs. Medium	Small vs. Large	Medium vs. Large						
Work satisfaction/work environment												
How satisfied are you with your current job in this hospital? (n = 10 850)												
Very dissatisfied	4	4	5	0.0104 ^a	0.0006 ^a	0.3639 ^a	5	4	0.4956 ^a	4	4	0.2875 ^a
A little dissatisfied	16	18	19				18	18		18	18	
Moderately satisfied	57	58	56				57	57		57	57	
Very satisfied	23	20	21				21	21		20	21	
How would you rate the work environment at your job in this hospital (such as adequacy of resources, relations with coworkers, support from supervisors)? (n = 10 823)												
Poor	16	17	18	0.0265 ^a	0.0273 ^a	0.8909 ^a	16	18	0.0387 ^a	17	17	0.0970 ^a
Fair	39	40	39				39	39		38	40	
Good	42	38	39				41	39		41	39	
Excellent	4	5	4				4	4		4	4	
Would you recommend your hospital to a nurse colleague as a good place to work? (n = 10 767)												
Definitely no	3	4	4	<0.0001 ^a	<0.0001 ^a	0.8320 ^a	4	4	<0.0001 ^a	4	4	0.0607 ^a
Probably no	18	23	23				23	21		21	22	
Probably yes	53	54	53				55	53		53	54	
Definitely yes	26	19	19				18	22		22	20	
Intention to leave												
If possible, would you leave your current hospital within the next year as a result of job dissatisfaction? (n = 10 832)												
Yes	30	33	36	0.0001 ^b	<0.0001 ^b	<0.0001 ^b	36	33	0.0004 ^b	38	32	<0.0001 ^b
No	70	67	64				64	67		62	68	
If yes, what type of work would you seek? (n = 3 369)												
Nursing in another hospital	33	28	38	<0.0001 ^b	0.0001 ^b	0.0001 ^b	39	31	<0.0001 ^b	42	30	<0.0001 ^b
Nursing, but not in a hospital	42	46	43				41	45		41	45	
Non-nursing	25	26	19				20	24		17	25	
Quality of care												
In general, how would you describe the quality of nursing care delivered to patients on your unit/ward? (n = 10 876)												
Poor	2	2	3	0.0593 ^a	0.0015 ^a	0.1569 ^a	3	3	0.6659 ^a	3	3	0.7265 ^a
Fair	21	24	25				24	24		24	24	
Good	65	62	60				61	62		60	62	
Excellent	12	12	12				12	12		13	11	
Would you recommend your hospital to your friends and family if they needed hospital care? (n = 10 752)												
Definitely no	1	1	1	0.0419 ^a	0.5400 ^a	0.0017 ^a	1	1	<0.0001 ^a	2	1	0.4235 ^a
Probably no	8	9	9				8	10		9	9	
Probably yes	58	59	55				55	58		55	58	
Definitely yes	33	30	34				36	31		34	32	

^aMann–Whitney *U* computation was based only on valid cases.^bChi-square computation was based only on valid cases; *df* = 2.

analysed using binary logistic regression to determine effects of hospital characteristics.

For each analysis unadjusted bivariate models were first fitted on the data, thereafter an adjusted multivariate model was fitted which controlled for the following: age, gender, education of the RN (baccalaureate degree *vs.* no baccalaureate degree), experience (as RN) in number of years and whether the RN worked full time or part time. In all regression analyses a mixed model approach was used to correct for the dependency of observations within hospitals.

Normal probability plots and residual analyses were used to control the assumptions in the linear regression. Data were analysed using SAS 9.3 for Windows (SAS Institute Inc., Cary, NC, USA).

Results

Description of sample

The total sample was composed of 11 015 RNs from 72 hospitals. The hospital characteristics are shown in

Table 2 and the characteristics of the RN respondents are presented in Table 3.

The overlap between hospital categories should be recognized; nine of the 10 university hospitals are also classified as large, as are seven of the 10 hospitals in high population density areas.

University hospitals had a slightly higher proportion of RNs with a baccalaureate degree than non-university hospitals, as was the case for larger hospitals and hospitals in high-density urban regions (Table 2) compared with others. Forty-one per cent of the RNs worked part-time, with the proportion of part-time RNs per hospital varying from 0% to 65%; a statistically significant difference was found positions with more full-time work among RNs in university (65% *vs.* 56%) and urban (67% *vs.* 56%) hospitals. Medium-sized hospitals had a lower proportion of full-time RNs (53%) compared with both small (57%) and large hospitals (65%) (Table 2).

Work satisfaction and work environment

Descriptive statistics of work satisfaction/work environment, intention to leave and quality of care in relation to hospital size, university hospital status and geographical area are shown in Table 1. There was a small but statistically significant difference in work satisfaction, such that RNs working in medium (78% moderately or very satisfied) and large hospitals (77%) reported less satisfaction with their work environment compared with small hospitals (80%),

whereas no differences were found by university hospital status and geographical area. The global rating of work environment was somewhat more positive from RNs in small hospitals than in medium and large hospitals; although statistically significant, the differences in responses were relatively small, with 46% of the RNs in small hospitals *vs.* 43% in medium and large hospitals rating work environment as good or excellent. A small but statistically significant difference could also be seen according to university hospital status, with RNs at university hospitals reporting slightly better work environment (45% answering good or excellent) than others (43%). Seventy-nine per cent of RNs in small hospitals would probably or definitely recommend their workplace to a colleague, compared with 73% in medium hospitals and 72% of RNs in large hospitals. This was also the case for 73% of RNs in university hospitals, compared with 75% of those in non-university hospitals although, as noted above, there was overlap between these categories.

Intention to leave

Registered nurses working in small hospitals reported significantly less intention to leave (30%) compared with RNs in medium (33%) and large hospitals (36%). The RNs in non-university hospitals reported less intention to leave (33%) than those in university hospitals (36%), and those in low-density areas reported less intention to leave (32%) than other RNs (38%). These results may be considered in light of the

Table 2

Hospital characteristics and proportions of respondent's educational level and proportion working full time/part time by hospital characteristic

	Hospital size			<i>P</i> ^a			University hospital status			Hospitals in high population density areas		
	Small	Medium	Large	Small vs. Medium	Small vs. Large	Medium vs. large	Yes	No	<i>P</i> ^a	Yes	No	<i>P</i> ^a
Number of hospitals	39	19	14				10	62		11	61	
Number of respondents	2303	3677	5035				3836	7179		3029	7986	
Per cent of respondents	21%	33%	46%				35%	65%		27%	73%	
Educational level												
Baccalaureate degree	51%	55%	62%	0.0020	<0.0001	<0.0001	62%	55%	<0.0001	65%	54%	<0.0001
Not a Baccalaureate degree	49%	45%	38%				38%	45%		35%	46%	
Full-time/part-time positions												
Full time	57%	53%	65%	0.0031	<0.0001	<0.0001	65%	56%	<0.0001	67%	56%	<0.0001
Part time	43%	47%	35%				35%	44%		33%	44%	

^aChi-square computation was based only on valid cases; df = 2.

Table 3
Respondents/nurse characteristics

	Number of respondents	Per cent of respondents	Mean
Gender			
Male	701	6	
Female	10 192	94	
Age			
Mean age			40.2
Minimum average age among hospitals			35.7
Maximum average age among hospitals			52.8
Educational level			
Baccalaureate degree	6200	57	
Not a Baccalaureate degree	4609	43	
Country of basic education			
In Sweden	10 642	98	
In a Nordic country (except Sweden)	91	1	
Other	151	1	
Experience			
As registered nurse (mean in years)			12.1
Minimum average years among hospitals			7.9
Maximum average years among hospitals			23.0
At present hospital (mean in years)			10.0
Minimum average years among hospitals			5.2
Maximum average years among hospitals			21.6
Full-time/part-time positions			
Full time	6418	59	
Part time	4458	41	

follow-up question about what type of work would be sought, with a greater proportion of RNs in larger hospitals, university hospitals and in high-density areas reporting preferring a position in another hospital than was the case for other RNs.

Quality of care

The RNs working in small hospitals described the quality of nursing care as good or excellent to a significantly higher extent (77%) than did RNs at large hospitals (72%). No differences were found related to university hospital status or population density. Small but statistically significant differences were found by hospital size, where 91% of RNs working on small hospitals would recommend their hospitals compared with 90% at medium and large hospitals. Of the RNs working in university hospitals, 91% would recommend their hospital to friends and family compared with 89% in other hospitals.

Burnout

Descriptive statistics for the three dimensions of the MBI are shown in Table 4 in relation to hospital size, university hospital status and geographical area.

Overall, differences in scale scores on the dimensions of the MBI varied according to the hospital characteristics studied. There were no significant differences with regard to emotional exhaustion given university hospital status ($P = 0.698$) or population density ($P = 0.449$). There were no significant differences with regard to personal accomplishment and population density ($P = 0.282$). Hospital size was related to mean ratings for emotional exhaustion but had less association with personal accomplishment.

While scores were relatively low across RN responses for depersonalization, mean scores differed significantly between all three hospital size comparisons (see Table 4 for P -values); medium (mean = 4.3) and larger (mean = 4.6) hospital RNs rated depersonalization relatively similarly compared with small hospital RNs (mean = 3.9). There was a statistically significant difference in mean scores in regards to university hospital status ($P = 0.01$); university RNs showed higher averages (mean = 4.5) compared with others (mean = 4.3), indicating slightly higher levels of depersonalization. Furthermore, RNs working in hospitals located in high population density areas rated depersonalization higher (mean = 4.8) compared with RNs in other hospitals (mean = 4.2, $P < 0.001$).

Predictors of job satisfaction, intention to leave, burnout and quality of care

Regression models are presented in Table 5. After unadjusted models were fitted to the data, a forward stepwise inclusion of variables was performed with the last model including all explanatory variables. These were controlled for the RNs' age, gender, experience as RN, level of education and part-time/full-time work. The interaction of university hospital status and geographic location was tested but as it did not prove significant, it was omitted in the last model.

In the final adjusted models, no relationships were found between either university hospital status or urban/rural setting and the RNs' assessments of work satisfaction and work environment. In the adjusted models, a small but statistically significant effect was found for hospital size, in that RNs from smaller hospitals tended to rate their work environment better [odds ratio (OR) 1.017, 95% confidence interval (CI)

Table 4
Descriptive statistics of subscales in Maslach Burnout Inventory

	Hospital size			P			University hospital status			Hospitals in high population density areas		
	Small	Medium	Large	Small vs. Medium	Small vs. Large	Medium vs. Large	Yes	No	P	Yes	No	P
Emotional exhaustion, scale 0–54 (9 items)												
Mean	20.2	21.1	21.2	0.0012	<0.0001	0.6060	21.0	20.9	0.6977	21.1	20.9	0.4493
SD	10.5	10.4	10.3				10.3	10.5		10.3	10.4	
Median	19	20	20				20	20		20	20	
Missing	150	266	356				274	498		228	544	
Depersonalization, scale 0–30 (5 items)												
Mean	3.9	4.3	4.6	0.0007	<0.0001	0.0016	4.5	4.3	0.0101	4.8	4.2	<0.0001
SD	4.4	4.7	5.0				4.9	4.7		5.1	4.6	
Median	2	3	3				3	3		3	3	
Missing	90	128	160				122	256		100	278	
Personal accomplishment, scale 0–48 (8 items)												
Mean	40.0	39.9	39.7	0.7039	0.0341	0.0425	39.7	39.9	0.0195	39.9	39.8	0.2819
SD	5.9	5.7	5.8				5.8	5.8		5.8	5.8	
Median	41	41	41				41	41		41	41	
Missing	188	287	370				280	565		234	611	

1.001–1.032] and were more likely to recommend the hospital to a colleague (OR 1.025, CI 1.003–1.047).

No statistically significant relationship was found between the hospital characteristics and RNs' intention to leave their present job. However, RNs working in urban areas, who did intend to leave, were more likely than colleagues in less dense areas to seek work in another hospital (OR 1.943, CI 1.312–2.877).

Registered nurses working in smaller hospitals rated the quality of nursing care as significantly better than did RNs in larger hospitals (OR 1.015, CI 1.003–1.027).

Discussion

In this national sample of over 11 000 RNs working with direct inpatient medical–surgical care from all acute care hospitals in Sweden, few relevant associations were found between hospital characteristics, which are not readily susceptible to change, and RN self-reports of work environment and satisfaction, intention to leave current job or nursing profession, quality of care and burnout. While in this large sample some statistically significant differences were found, their relevance remains questionable.

For example, the statistically significant differences found on the MBI were, at most, 0.7 points on a scale from 0 to 30 and did not remain statistically significant in the multiple regression analyses. Statistically significant differences were found in the multiple regression analyses related to hospital size, such that RNs in smaller hospitals were more positive about

their work environment and quality of nursing care, but these differences were also small. If the statistical results are considered in relation to their implications for hospital size, the hospitals would need to vary in size by approximately 17 000–25 000 admissions/year (or 300–350 beds) to reach an odds ratio of 1.5 for a one-scale step difference on a four-step scale for ranking work environment.

The most potentially relevant difference found in this study involved choice of new job among RNs who reported an intention to leave their workplace during the following year because of dissatisfaction. The RNs working in hospitals in high population density areas reported that they would seek work as a RN in another hospital twice as often as was the case for other respondents. This can be seen along with the finding that a significantly higher proportion of RNs in small and medium-sized hospitals, as well as those in rural areas, worked part-time than was the case in larger, university and urban hospitals. It is unclear in these data if this is a matter of individual choice, or represents the only option available. These findings should be considered in light of the possibility of obtaining another RN position without relocating, as pointed out by Josephson *et al.* (2008) in their study based on data from Swedish nursing staff. Josephson *et al.* (2008) also point to the fact that, in Sweden, the same factors may influence job turnover and long-term paid sick leave. Long-term paid sick leave might occur more in situations where the job market does not allow for alternative positions as a hospital RN, although we have no access to such data in our study

Table 5

Predictors of job satisfaction, intention to leave burnout and quality of care

	Unadjusted (bivariate) analysis			Adjusted ^a (multivariate) analysis			Adjusted ^b (multivariate) analysis		
	95% Confidence			95% Confidence			95% Confidence		
	Odds ratio	limits	P ^d	Odds ratio ^c	limits	P ^d	Odds ratio ^c	limits	P ^d
Work satisfaction/work environment									
How satisfied are you with your current job in this hospital?									
University hospital, Yes vs. No	1.079	(0.650 to 1.791)	0.7680	0.977	(0.491 to 1.944)	0.9470	0.998	(0.503 to 1.982)	0.9982
Urban area, Yes vs. No	0.916	(0.553 to 1.516)	0.7319	0.759	(0.394 to 1.461)	0.4092	0.765	(0.398 to 1.470)	0.4218
Size, number of yearly discharges (by increment of 1000)	1.006	(0.995 to 1.017)	0.2930	1.012	(0.996 to 1.028)	0.1378	1.011	(0.995 to 1.027)	0.1724
How would you rate the work environment at your job in this hospital (such as adequacy of resources, relations with coworkers, support from supervisors)?									
University hospital, Yes vs. No	0.837	(0.496 to 1.411)	0.5040	0.786	(0.400 to 1.544)	0.4841	0.791	(0.403 to 1.552)	0.4957
Urban area, Yes vs. No	0.657	(0.395 to 1.092)	0.1049	0.557	(0.295 to 1.051)	0.0710	0.557	(0.295 to 1.051)	0.0698
Size, number of yearly discharges (by increment of 1000)	1.004	(0.993 to 1.015)	0.5021	1.017	(1.002 to 1.032)	0.0284	1.017	(1.001 to 1.032)	0.0317
Would you recommend your hospital to a nurse colleague as a good place to work?									
University hospital, Yes vs. No	1.173	(0.570 to 2.410)	0.6650	1.033	(0.394 to 2.707)	0.9468	1.028	(0.391 to 1.702)	0.9536
Urban area, Yes vs. No	0.696	(0.341 to 1.421)	0.3194	0.426	(0.170 to 1.069)	0.0691	0.431	(0.172 to 1.084)	0.0741
Size, number of yearly discharges (by increment of 1000)	1.011	(0.996 to 1.026)	0.1681	1.025	(1.003 to 1.048)	0.0240	1.025	(1.003 to 1.047)	0.0283
Intention to leave									
If possible, would you leave your current hospital within the next year as a result of job dissatisfaction?									
University hospital, Yes vs. No	1.152	(0.759–1.748)	0.5059	1.045	(0.590–1.852)	0.8801	1.076	(0.613–1.890)	0.3005
Urban area, Yes vs. No	1.104	(0.729–1.670)	0.6404	1.002	(0.581–1.730)	0.9930	1.005	(0.587–1.721)	0.9812
Size, number of yearly discharges (by increment of 1000)	1.006	(0.997–1.015)	0.1799	1.007	(0.994–1.020)	0.2802	1.007	(0.994–1.020)	0.7958
You seek? Nursing in another hospital									
University hospital, Yes vs. No	1.337	(0.996 to 1.794)	0.0534	1.144	(0.767 to 1.706)	0.5102	1.196	(0.811 to 1.761)	0.3624
Urban area, Yes vs. No	1.773	(1.353 to 2.324)	<0.0001	2.098	(1.402 to 3.138)	0.0003	1.943	(1.312 to 2.877)	0.0009
Size, number of yearly discharges (by increment of 1000)	1.004	(0.998 to 1.011)	0.2047	0.990	(0.980 to 1.000)	0.0450	0.991	(0.981 to 1.000)	0.0495
Non-nursing									
University hospital, Yes vs. No	0.857	(0.613 to 1.198)	0.3666	1.280	(0.843 to 1.944)	0.2458	1.175	(0.791 to 1.748)	0.4256
Urban area, Yes vs. No	0.624	(0.451 to 0.862)	0.0043	0.756	(0.494 to 1.157)	0.1970	0.773	(0.515 to 1.160)	0.2129
Size, number of yearly discharges (by increment of 1000)	0.991	(0.984 to 0.997)	0.0058	0.992	(0.982 to 1.002)	0.1127	0.993	(0.984 to 1.002)	0.1411
Quality of care									
In general, how would you describe the quality of nursing care delivered to patients on your unit ward?									
University hospital, Yes vs. No	1.089	(0.751 to 1.579)	0.6523	0.866	(0.524 to 1.432)	0.5754	0.887	(0.539 to 1.457)	0.6325
Urban area, Yes vs. No	0.979	(0.674 to 1.423)	0.9116	0.736	(0.454 to 1.193)	0.2137	0.715	(0.443 to 1.155)	0.1701
Size, number of yearly discharges (by increment of 1000)	1.008	(1.000 to 1.016)	0.0520	1.015	(1.003 to 1.027)	0.0120	1.015	(1.003 to 1.027)	0.0121
Would you recommend your hospital to your friends and family if they needed hospital care?									
University hospital, Yes vs. No	0.763	(0.416 to 1.401)	0.3829	0.579	(0.249 to 1.346)	0.2042	0.577	(0.250 to 1.336)	0.2081

Table 5
Continued

	Unadjusted (bivariate) analysis			Adjusted ^a (multivariate) analysis			Adjusted ^b (multivariate) analysis		
	95% Confidence			95% Confidence			95% Confidence		
	Odds ratio	limits	P ^d	Odds ratio ^c	limits	P ^d	Odds ratio ^c	limits	P ^d
Urban area, Yes vs. No	1.079	(0.588 to 1.979)	0.8058	1.254	(0.564 to 2.791)	0.5789	1.232	(0.555 to 2.734)	0.6256
Size, number of yearly discharges (by increment of 1000)	1.003	(0.990 to 1.016)	0.7047	1.009	(0.990 to 1.029)	0.3382	1.010	(0.991 to 1.029)	0.3231
	95% Confidence			95% Confidence			95% Confidence		
	Estimate	limits	P ^d	Estimate	limits	P ^d	Estimate	limits	P ^d
Maslach Burnout Inventory									
Emotional exhaustion, scale 0–54 (9 items)									
University hospital, Yes vs. No	0.237	(–1.566 to 2.040)	0.7965	–1.471	(–4.394 to 1.452)	0.6724	–1.471	(–4.328 to 1.386)	0.6778
Urban area, Yes vs. No	–0.057	(–1.855 to 1.741)	0.9504	–1.914	(–4.705 to 0.878)	0.4095	–1.977	(–4.719 to 0.765)	0.3798
Size, number of yearly discharges (by increment of 1000)	0.027	(–0.011 to 0.065)	0.1677	0.043	(–0.012 to 0.098)	0.1231	0.044	(–0.010 to 0.098)	0.1112
Depersonalization, scale 0–30 (5 items)									
University hospital, Yes vs. No	0.286	(–0.173 to 0.745)	0.2218	–0.367	(–0.991 to 0.256)	0.0604	–0.327	(–0.957 to 0.303)	0.0831
Urban area, Yes vs. No	0.666	(0.228 to 1.104)	0.0029	0.462	(–0.226 to 1.151)	0.2482	0.406	(–0.295 to 1.106)	0.3633
Size, number of yearly discharges (by increment of 1000)	0.016	(0.007 to 0.025)	0.0006	0.011	(–0.002 to 0.024)	0.1059	0.012	(–0.001 to 0.026)	0.0726
Personal accomplishment, scale 0–48 (8 items)									
University hospital, Yes vs. No	–0.322	(–0.726 to 0.082)	0.1182	–0.261	(–0.899 to 0.376)	0.2401	–0.323	(–0.979 to 0.332)	0.2449
Urban area, Yes vs. No	0.146	(–0.290 to 0.581)	0.5121	0.698	(–0.051 to 1.447)	0.0308	0.557	(–0.214 to 1.327)	0.0702
Size, number of yearly discharges (by increment of 1000)	–0.005	(–0.014 to 0.004)	0.2675	–0.007	(–0.021 to 0.007)	0.3534	–0.007	(–0.022 to 0.007)	0.3149

^aModels controlled for age and sex.^bModels controlled for sex, education (Baccalaureate/not Baccalaureate) experience(as registered nurse) and full time/part time.^cEffects of continuous variables are assessed as one-unit offsets from the mean.^dTest: Type III Tests of Fixed Effects.

to control this hypothesis. This hypothesis is also supported by Rondeau *et al.* (2008), who relate vacancy rates for RNs at hospitals to the ease with which RNs are able to move from one job to another. It is thus likely that this finding strongly relates to Sweden as a largely rural country with long distances between hospitals and with a public, non-competitive labour market for RNs.

We do not imply that structural characteristics are unimportant, but wish to emphasize the possibility for constructive change which surmounts possible limitations. Sellgren *et al.* (2009), in a study of Sweden's largest hospital located in a high-density population area, found that unit size was a significant factor in actual turnover, with less turnover in units with 25 or fewer employees than in those units with up to 75

employees. In units ≥ 75 employees, the turnover rate decreased, which they explained by the subdivision of large units into smaller teams as the primary work unit. This exemplifies just one strategy in which seemingly rigid structural features can be adapted.

Limitations

There are a number of factors that should be considered when interpreting these results. This is a national Swedish study with a particular health-care system and context; however, we include all acute care hospitals in the country, which eliminates selection bias, and the results appear well in line with other research from different contexts (Lake & Friese 2006, Baernholdt & Mark 2009). There is a high degree of

overlap, as previously mentioned, between size and university hospital status, as well as between size and geographic location, although this is considered in the regression models. In this population-based study, this reflects the reality of the Swedish health care system, and may well be relevant even in other settings. Only RNs who are union members were included in the survey; while this is a limitation, given that over 80% of professionally active RNs are union members, in conjunction with the high response rate to the survey, other forms of recruitment might have increased, as well as altered the form of selection bias.

Conclusions

We conclude that structural factors, which are not readily altered, such as size, teaching status and location in rural or urban settings are not strongly related to RNs' self-reports of outcomes such as burnout, quality of care and job satisfaction or their intent to leave their job. This is an important finding because structural factors are beyond the control of operational managers, and can often only be changed through fundamental changes to health systems and structures.

Implications for nursing management

Part of the stimulus for this study was a perception that policymakers and managers tend to express assumptions about the overwhelming importance of structural factors as determinants of these outcomes, rendering action to address problems ineffective. Earlier research has shown that factors such as work environment, staffing organisation, and leadership are related to RNs' self-reports of outcomes such as burnout, quality of care and job satisfaction, and their intention to leave – results confirmed by the RN4CAST study (Aiken *et al.* 2012). Many of these characteristics are associated with so called 'Magnet' hospitals, which are able to attract and retain employees and to deliver high-quality care in a positive working environment (Aiken *et al.* 1994). These factors are potentially susceptible to change on a hospital and a departmental level (Laschinger *et al.* 2003, Stordeur & D'Hoore 2007, Cummings *et al.* 2010). The results presented here indicate that structural factors less readily susceptible to change are not vital factors in creating a workplace with satisfied RNs willing to remain in their jobs.

This empirical study shows that hospital and nursing managers should not regard nursing turnover and job satisfaction as primarily determined by factors outside their control. They can be encouraged that

their efforts to improve work environment and quality of care can be effective, and false assumptions about the importance of structural factors, which are outside their control and could have a demotivating effect, can be dispelled.

These results suggest that hospitals in urban areas may face particular challenges. In these environments RNs may have choice of alternative employment and thus having formed an intention to leave may be more likely to act upon it. However, this finding simply illustrates the importance of making constructive changes to the work environment to attract and maintain RN staff in these settings. Attention to providing a positive work environment is important and potentially beneficial irrespective of the structural constraints within which managers may operate.

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Ethical approval was obtained from the Research Ethics committee of Stockholm (Regionala etikprövningsnämnden i Stockholm: Dnr 2009/1587-31/5).

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