PATIENT SATISFACTION WITH NURSING CARE DELIVERED IN MEDICAL UNITS IN POST-TRANSITIONAL COUNTRY: A CORRELATIONAL STUDY

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ABSTRACT

Introduction: There is limited evidence on the relationship between patients' satisfaction with nursing care and some variables in medical units in post-transitional countries.

Materials and methods: This correlational study design was aimed at discovering correlations, if any, between the patient satisfaction with nursing care and nursing care activities. The study was performed in a Slovenian medical hospital, and variables were collected at (1) the ward level (patients cared for on a daily basis; number of hours/patients a day), (2) nursing care level, by observing nursing activities at 10-minute intervals; and (3) at the patient level, by administering the Patient Perception of Hospital Experience with Nursing tool.

Results: A total of 218 patients were involved, and their satisfaction with nursing care was high (average=4.42, Sd=0.53). On average, 80 patients were cared for per day at the unit level by ensuring around 3.6 hours of nursing care; 7,732 activities were performed by 43 nursing personnel, and only a third (n=2,842, 36.8%) of all nursing activities were performed in contact with the patient. Patient satisfaction was significantly negatively correlated with the number of patients cared for at the unit level on a daily basis (p <0.000). On the contrary, it was positively correlated (p <0.000) with the amount of care hours/patient/day, and with some direct care activities (p<0.000).

Conclusions: To ensure patient satisfaction, more nurses should deal with the increased number of patients admitted in the medical units. It is recommended to increase the amount of nursing care offered by registered nurses, given that the competences acquired at the academic level can affect the environment and the caring processes and, thereby, the patients' satisfaction.

Keywords: evidence-based healthcare management, medical units, nursing service hospital, nursing care, patient satisfaction post-transitional country.

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Introduction

Several studies[e.g., 1-4] have been conducted to discover predictors of patient satisfaction with hospital care which has been defined as the degree of alignment between the expected and the actual care as perceived by patients[5]. At the hospital level, nurses have been recognised among the key factors influencing patient satisfaction, because they are involved in almost every aspect of healthcare process[6].

Although nursing care processes are integrated with other healthcare processes, when nursing care quality is poor, patients' satisfaction has been documented to be low[7]. Nursing care relies upon caring and individualised interventions[8], such as nurses' kindness and competence in delivering technical procedures, which all have been recognised as influencing patient satisfaction[9, 10] along with other factors identified at the patients' individual level[6, 11, 12].

At the hospital level, according to the Donabedian model[13], some nursing care structural

and process features have been associated with the quality of care capable of increasing patient satisfaction. Regarding the structure, the number of patients per nurse in hospital[1, 3, 4], the nursing care hours per patient day[14], the proportion of registered nurses (RNs)[1, 15], and the presence of RNs or specialist nurses[16-18] have all been suggested to influence the quality of care as perceived by patients. Regarding the processes, the total amount of direct patient care[19, 20], the frequency of communication[21, 22], and the organisational priorities perceived with regard to the quality of care[1], have also been documented as affecting patients' satisfaction with nursing care. However, the amount of nursing care and its skill mix is only a proxy measure regarding what the nursing staff performs daily at the bedside; nursing activities can include contact and no-contact time, as well as unproductive time[23]. According to available studies, hospital nurses spend from 7.3%[24] to 54.2%[25] of their time in direct patient care, from 0%[26] to 59%[27] in indirect care, and from 14% to 17% in personal time[28].

Despite its relevance as also in the field of patient's reported outcomes, to the best of our knowledge, studies exploring the relationship between patients' satisfaction with nursing care and the (a) number of patients cared for at the unit level, (b) the amount of nursing care offered, and (c) what the nursing staff performs on a daily basis, have never been published to date. Moreover, most of the available studies on patient satisfaction with nursing care have been performed in high-income countries were patients admitted in medical units are cared for with more resources as compared to low-income countries[1, 2, 15].

Furthermore, in the context of the country's transition, no studies have been published regarding hospital patients' satisfaction[29].

Therefore, the general intent of this study was to advance knowledge on factors influencing patients' satisfaction with hospital care, specifically by discovering the contribution of the (a) nursing care amount, and (b) the processes of nursing care, on patient satisfaction.

The study was aimed at examining the correlation between hospital nurse structure and process characteristics and the patient satisfaction with nursing care in medical units. Specifically, it was aimed at discovering any potential correlations between the patient satisfaction with nursing care and (a) the number of patients cared for on a daily basis by the nursing staff, (b) the amount of nursing

care delivered on a daily basis to these patients, and (c) the nursing care activities performed by distinguishing those direct activities from others.

We hypothesised that the low number of patients cared for on a daily basis in the medical units, the high amount of nursing care delivered, and the high proportion of direct nursing activities would reflect in high patient satisfaction with nursing care.

Methods

Correlational study design was designed and performed in a Slovenian secondary care regional hospital in 2014.

Setting
The Slovenian care system has been documented as in transition due to the several changes faced in the last years. Until 1992, the country's system was based upon communist principles, where paternalistic attitudes were interwoven into all relationships, including at the hospital level[30, 31]. Furthermore, in Slovenia, the number of nursing professionals (including RNs and healthcare assistants [NAs]) has been reported as 8.38 per 1,000 citizens, similar to the European (EU) average of 8.49 per 1,000[29]. However, in acute wards of rural hospitals, the workforce is composed by nearly six NAs and 2.33 RNs per 1,000 citizens[32]. Thus, the current nursing team at the hospital level is composed mostly by NAs; the team leader is the RN[33]. While RNs are educated at the university level with a three-year nursing programmes, NAs are educated at the secondary school level with a course lasting four years[34].

For the intent of study, there approached a hospital composed by 24 specialty departments with approximately 400 beds and an annual bed occupancy rate of around 80%. The hospital was equipped with 300 units of nursing staff: 103 RNs (30.6%), 224 NAs (66.5%), and 10 auxiliary workers (AWs; 2.9%). Specifically, for the purposes of the study, the medical unit was selected on the basis of the feasibility of the research process and the availability of participants.

Forty-three nurses staffed the observed medical ward: (a) seven RNs were working at the time of the study, at least two per shift; (b) 36 NAs, from six to 15 per shift; and (c) one AW was working on morning shifts.

Participants

As the study target, two populations were identified: (a) nursing staff, and (b) patients.

• *Nursing staff*: All RNs and NAs (hereafter called 'nursing staff') were eligible. Specifically, those working at the time of the study in the medical ward and willing to participate were included. Therefore, the head nurse and the AW were excluded from the study according to their specific tasks.

• *Patients*: On a preliminarily basis, a sample size of 217 subjects was calculated (confidence level (95%), confidence interval (5%) and expected population of 500 individuals in one-month observation period). Therefore, all patients who were (i) admitted to the ward for at least 24 hours, (ii) staying in the medical ward during the study period, (iii) capable of communicating, and (iv) willing to participate were invited to participate in the study. Patients were included consecutively according to their inclusion criteria and the expected sample size. Out of the total 484 patients admitted to the ward during the study period, 218 were eligible.

Variables, data collection instruments, and procedures

Variables were collected at the ward, nursing staff, and patient levels. At the ward level, daily data from nursing shift schedules and hospitalised patients were collected to calculate the ratio of patients per nursing staff and the staff hours per patient day (including RNs and NAs). The principal investigator (MP) of the study collected data on a daily basis after the study approval and by contacting the chief nurse.

At the nursing staff level, we used the Maribor Primary Health Care Patient Classification System instrument to measure the nursing care activities performed[31]. This instrument measures the nursing care activities performed divided into four main categories:

• Care contact time (direct patient care) includes all hands-on care, one-to-one observation or support to patients, and direct communication with patients;

• Indirect contact time (indirect patient care) includes patient documentation, professional discussion to plan patients' care, discharge planning, communication with patients' relatives and friends, ordering investigations, and shift handovers;

• Other nursing activities: other patient-focused activity (completing nursing audits, checking clinical equipment), staff-focused activity (stu-dent support, giving and receiving training sessions, personal development reviews, rounds), and ward-focused activity (ensuring environmental safety and cleanliness, ordering or unpacking stock);

• Unproductive time: personal staff time (staff meals, breaks) and wasted time (waiting for equipment, waiting for colleagues, etc.).

According to the instrument nature, capable of allowing multi-moment direct observations[29], with the tool there were collected data also with regard to the place where the staff was at the moment of the observation (e.g., in the patients' room, in the nursing duty room, in the patients' bathroom, in the re-animation area, in the office, in the recreation area, or out of the ward). The instrument was selected for the following reasons: (a) it was found to be valid and reliable in previous studies conducted in Slovenia[29]; (b) it detects the quantity of direct patient care; and (c) it is well known to Slovenian head nurses. Moreover, given that the instrument was used in primary healthcare, it was adapted for the hospital environment[23].

For the aims of the study, we programmed 16 hours of observations in the index research days, including morning and afternoon shifts (from 6 AM to 10 PM). Observations were performed in a way that all working days of the week were included in a range of one month, randomly selected by the principal investigator of the study (MP).

Throughout observations, activities were recorded at intervals of 10 minutes, allowing six observations/hour. Data collection was performed by 18 third-year trained nursing students; they were familiar with the structure and processes of nursing care in a medical ward, given that they previously had at least eight weeks of clinical practice in the unit. At the time of the observation, the nursing students were dressed in personal clothes, and they were not involved in nursing care. A pilot phase was performed to increase reliability in the data collection process.

At the patient level, the 15-Item Single-Factor Patient Perception of Hospital Experience with Nursing (PPHEN) tool[7] was used. The tool was developed by Dozier et al.[7] in the English language and, for the study purposes, was translated into Slovenian according to standard procedures for forward and backward translation[35]. The PPHEN was selected because (a) it was found to be valid and reliable; (b) it addresses nursing care rather than other dimensions of the hospital experience[7] (c) it can be used in hospitalised patients during their in-

hospital stay[5]; (d) it is short, and therefore not tiring for patients; and (e) it allows relatives to participate when the patient cannot answer[7]. Cronbach's alpha for the PPHEN questionnaire in the Slovenian language was 0.905 (n=15); moreover, the tool was piloted in a preliminarily fashion in a group of 15 patients (not involved in this study) to test its comprehensibility and feasibility. No changes were required in the formulation of the items, and the patient feedback was positive.

Patients' satisfaction was reported using a five-point Likert scale (1=strongly disagree/not at all satisfied, 5=strongly agree/completely satisfied). The score also results in a patient satisfaction index including all variables and ranging from 1 to 5; higher scores indicate a higher degree of satisfaction with nursing care. Patients also filled in some questions exploring demographic variables (e.g., age and gender) as well as data regarding whether the respondent was the patient or a relative (in case of need).

Specifically, around 15 (6.9%) questionnaires were filled in by relatives, 95 (43.6%) patients were helped by researchers to fill in the form, and the remaining 110 (50.5%) questionnaires were filled in by the patients. The questionnaires were distributed by nine third-year trained nursing students, who were not included in direct observations or in nursing care.

On the research index days, nursing activities were observed and the patients included were invited to fill in the questionnaire.

Data analysis

On a preliminarily basis, given that one independent variable (=nursing care activities) was based upon direct observation of behaviour, the research team considered the possible influences of the so-called Hawthorne effects[36]. According to the literature, awareness of being observed or having behaviour assessed engenders beliefs about researcher expectations; moreover, conformity and social desirability considerations can lead to behaviour changes in line with these expectations[36].

Therefore, out of the nine research days, only six were included in the final analysis with the intent to increase study reliability. These days were selected casually in advance before the data collection phase and reported in a closed envelope that was opened only at the end of the study process.

Only the principal investigator (MP) was aware of it; the excluded days were the first, third, and sixth of observation.

Therefore, a total of 7,732 (78.4%) out of 9,866 observed nursing activities were used in the final analysis. As a consequence, 149 (68.4%) out of the total 218 gathered questionnaires were used. The data were statistically processed using SPSS 21.0 statistical software (IBM Corp., Group NY, USA).

The levels of analysis were the hospital ward, the individual nurse, and the patient. Quantitative data analysis was performed using descriptive methods: mean (M), standard deviation (Sd), frequency (n), percentage (%), Pearson's correlation (r), Spearman's correlation (R), and partial correlation (ParCorr) when controlling one of the variables. Spearman's correlation coefficient, unlike Pearson's correlation coefficient, does not require the assumption that the relationship between the variables is linear, nor does it require that the variables be measured on interval scales[37]. Correlation strengths were valued as follows: 0-0.09 not correlated, 0.1-0.3 weak, 0.31-0.6 medium, and 0.61-1 strong correlation[38]. We also used the Chi Square Test to assess differences, if any, between frequencies. The significance was set at $p < 0.05$.

Ethical considerations

Institutional review board approval was obtained prior to the start of the study from the Faculty of Health Sciences, University of Primorska (Slovenia), and from the hospital administration. The study was conducted in accordance with the Code of Ethics for Nurses and Nurse Assistants as well as the Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects[39]. Specifically, patient and nurse consent were obtained on site. The patients were informed that a 'research on nursing care' was being conducted, offered the name of the responsible contact details when necessary, and provided with information regarding what would happen to the data collected.

Student nurses were trained not interfere with nursing care; moreover, they were instructed to interrupt the observation in the case of critical events (e.g., cardiopulmonary resuscitation) so as not to interfere with or interrupt the care required. No events occurred during the observation.

Results

Forty-three nurses participated in this study (7 RNs and 36 NAs), representing the 95.6% of the

medical ward's nursing population. A total of 336 hours of observations were performed, and 7,732 nursing activities were recorded (n=5,128, 66.3% on morning shifts; 2,604, 33.7% on evening shifts).

Patients and amount of nursing care on a daily basis

In the 94 available beds, there were, on average, 80 patients/day. There were at least two RNs staffed per every day shift, from 7 AM to 3 PM and from 3 PM to 11 PM. NAs worked seven-hour shifts (from 6 AM to 1 PM and from 1 PM to 10 PM). Therefore, the nursing teams consisted mostly of NAs (64%), and they delivered 61.3% of the care. Each nursing staff cared for an average of three patients/day; every RN was responsible for an average of 8.5 patients/day, as reported in Table 1.

Variables[a]	N (Sd)	%
N patients, average/day	80.6 (8.11)	-
N patients/nursing staff, average/day	3.0 (0.58)	-
N patients/RN	8.5 (1.61)	-
N patients/NA	4.7 (0.93)	-
Nursing care hours per patient day[b]	3.6 (0.88)	100
RN hours	1.4 (0.33)	38.7
NA hours	2.2 (0.55)	61.3

Table 1: Nursing resources in the medical ward.
[a]N number, NA nursing assistant, Sd standard deviation, % percent; Nursing staff, includes both profiles RN and NA, RN registered nurse

[b]nursing care hours per patient day, calculated from (((total nursing staff on duty, 6 research days, 2 shifts) x no. hours worked per day)) x 1.5) / number of hospitalised patients

Nursing care process

About 36.8% (n=2,842) of all nursing staff activities involved direct contact with patients. Hands-on care was recorded 2,124 times and represented 27.5% of all recorded nursing activities. One-to-one observation was identified 336 times (4.2%), direct communication with patients 294 times (3.8%), and support to patients 98 times (1.3%).

About 18.5% of all nursing activities were indirect patient care. A large amount was represented by patient documentation, professional discussion to plan patients' care, discharge planning, and communication with patients' relatives and friends (n=538, 6.9%). Shift handovers were identified 469 times (6.1%) and ordering investigations and preparing for medical/technical procedures performed independently by nursing staff were recorded 425 times (5.5%).

Other nursing activities were recorded 2,013 times (26%): patient-focused activities 1,470 times (19%), ward-focused activity 446 times (5.8%), and staff-focused activity 97 times (1.2%). Unproductive time represented 9.5% (n=735) of all observed activities, including personal staff time (n=729, 9.4%) and wasted time (n=6, 0.1%). Missing information about staff activities was 9.2% (n=710) (Table 2).

Nursing care activities		Nursing care activities within nursing staff profiles % (n)			χ^2 (Df) Sig.
		RNs	NAs	Total	
Direct patient care	Hands-on care	10.1 (223)	34.3 (1,901)	27.5 (2,124)	
	One-to-one observation	0.7 (15)	5.6 (311)	4.2 (326)	
	Direct communication with patients	2.6 (57)	4.3 (237)	3.8 (294)	
	Support to patients	3.8 (82)	0.3 (16)	1.3 (98)	
	Sub-total direct patient care	*17.2 (377)*	*44.5 (2465)*	*36.8 (2842)*	
Indirect patient care	Patient documentation & professional discussion [a]	7.4 (163)	6.8 (375)	6.9 (538)	
	Shift handovers	3.4 (75)	7.1 (394)	6.1 (469)	
	Ordering investigations [b]	9.8 (214)	3.9 (211)	5.5 (425)	124,871
	Sub-total indirect patient care	*20.6 (452)*	*17.8 (980)*	*18.5 (1432)*	(1)
Other nursing activities	Other patient-focused activity	30.4 (667)	14.5 (803)	19 (1470)	<0.001
	Ward-focused activity	1.3 (29)	7.5 (417)	5.8 (446)	
	Staff-focused activity	3.4 (74)	0.4 (23)	1.2 (97)	
	Sub-total other nursing activities	*35.1 (770)*	*22.4 (1243)*	*26 (2013)*	
Unproductive time	Personal staff time	5.4 (118)	11.1 (611)	9.4 (729)	
	Wasted time	0.2 (5)	0 (1)	0.1 (6)	
	Sub-total unproductive time	*5.6 (123)*	*11.1 (612)*	*9.5 (735)*	
Missing data[c]		21.5 (473)	4.3 (237)	9.2 (710)	
Total		100 (2,195)	100 (5,537)	100 (7,732)	

Table 2: Proportions of nursing care activities within nursing profiles.
χ^2 Chi Square, Df degrees of freedom; n number, NA nursing assistants, RN registered nurses, %, percent, p statistical significance p=0.05.
[a]patient documentation, professional discussion to plan patients' care, discharge planning, and communication with patient's relatives and friends
[b]individual medical-technical procedures done independently by nursing staff; [c]nursing activities that could not be observed, as the RN or the NA was not in the medical ward

Nursing staff performed 39.2% of all activities (n=3,022) in the patients' room. The activity frequencies differed significantly between RNs and NAs (p<0.000). Observed RN work activities consisted of around a fifth (n=377, 17.2%) of direct patient care, while other activities were performed without contact with the patient; RN activities were done mostly in the office or at the unit desktop (n=759, 34.8%). More than a fifth (n=480, 22%) of activities were performed in the patients' room:

10.1% in the re-animation room or in the patient's bathroom (n=220), 9.0% in the recreation and nursing duty room (n=196), and 6.5% (n=141) outside the medical ward. In 17.7% (n=386) of observation intervals, the RNs were in other places (e.g., walking corridors).

The NAs' work activities consisted of nearly a half (n=2,465, 44.5%) in contact with the patient. Their activities were generally (n=2,542, 46.0%) performed in the patients' room, 16.9% (n=937) in the office or at the unit desktop, and 15.8% (n=873) in the recreation and nursing duty room. The rest of the activities were performed in the re-animation room or in the patients' bathroom (n=659, 11.9%) and other places in the hospital out of the unit (n=367, 6.6%). Also in this case, in 2.8% (n=154) of observation intervals, the NAs were in other places (e.g., walking corridors).

Patient satisfaction with nursing care

Respondents were mostly women (n=82, 56.9%), with an average age of 67.4 years (Sd=14.7). The patient satisfaction index including all variables from the PPHEN instrument reported that patients perceived high satisfaction with nursing care, with an average score of 4.42 (above good/high) (Sd= 0.53) and ranging from 3 (good) to 5 (high). The highest average score emerged in the item 'Nurses helped me to feel at ease in the hospital'; the lowest score emerged for the item 'Nurses'

Patient satisfaction variables	Descriptives			
	min	max	M	Sd
I was sure that nurses would be there when I needed them.	2.00		4.52	0.75
Little things were done for me without asking.	1.00		4.21	0.91
The nurses thought ahead about what I needed.	1.00		4.18	0.93
The nurses helped my outlook become more realistic.	1.00		4.49	0.70
The nurses helped me better deal with the unknowns of this hospitalisation.	1.00		4.47	0.72
The nurses' explanations helped put me at ease.	1.00		4.44	0.87
The nurses made me feel relaxed when treatments were being done.	2.00		4.51	0.67
The nurses gave me their undivided attention while caring for me.	2.00	5.00	4.50	0.72
My requests were promptly attended to by the nursing staff.	2.00		4.42	0.78
I was sure that nurses alerted others to my needs and requests.	1.00		4.29	0.89
I feel that nurses understood what this illness means to me.	1.00		4.30	0.81
I know that due to the nurses' efforts some problems were avoided.	2.00		4.27	0.81
The nursing staff helped me manage the fears I had about my illness.	1.00		4.35	0.91
The nurses helped me feel at ease in the hospital.	2.00		4.65	0.62
The nurses' actions made me feel cared for.	1.00		4.59	0.66
Patient satisfaction index	**3.00**		**4.42**	**0.53**

Table 3: Patient satisfaction with nursing care (n=149).
M mean, min minimum, max maximum, n number, NA nursing assistant, RN graduated (registered) nurse, % percent, Sd standard deviation
Patient satisfaction index, includes all 15 variables researching patient satisfaction

prediction about what the patient needs' (Table 3). Additionally, patient satisfaction with nursing care was associated with the respondents' status (patient or relative) (r= 0.278, p<0.000). Satisfaction with nursing care was not correlated to the respondents' gender (r=0 .042, p=0.632) or age (r= 0.119, p= 0.173).

Patient satisfaction variables	Number of patients on unit/day (r)	Nursing staff hours/patient day (r)			Frequency of RN activities (P)		Frequency of all nursing staff activities (R)	
		RN	NA	RN + NA	All activities	Contact activities	All activities	Contact activities
I was sure that nurses would be there when I needed them.	-0.057**	0.067**	0.044*	0.053**	-0.005	0.057	-0.013	0.060**
Little things were done for me without asking.	-0.021	-0.025	-0.050*	-0.041*	-0.004	0.035	-0.015	0.055*
The nurses thought ahead about what I needed.	-0.223**	0.218**	0.190**	0.202**	0.013	0.063	0.023	0.051*
The nurses helped my outlook become more realistic.	-0.136**	0.131**	0.128**	0.130**	0.004	0.050	0.008	0.039
The nurses helped me better deal with the unknowns of this hospitalisation.	-0.022	0.008	0.014	0.012	0.032	0.014	0.011	0.036
The nurses' explanations helped put me at ease.	-0.087**	0.049*	0.018	0.030	-0.003	0.016	-0.010	0.033
The nurses made me feel relaxed when treatments were being done.	-0.170**	0.143**	0.142**	0.143**	0.024	0.024	0.025	0.031
The nurses gave me their undivided attention while caring for me.	-0.099**	0.075**	0.038	0.052*	-0.044	0.036	-0.044*	0.028
My requests were promptly attended to by the nursing staff.	-0.111**	0.113**	0.104**	0.108**	0.006	0.048	0.011	0.028
I feel that nurses understood what this illness means to me.	-0.093**	0.088**	0.069**	0.077**	-0.005	0.016	0.003	0.017
I know that due to the nurses' efforts some problems were avoided.	-0.015	0.009	0.012	0.011	-0.027	0.009	0.006	0.016
I was sure that nurses alerted others to my needs and requests.	-0.138**	0.106**	0.078**	0.089**	-0.016	0.002	0.027	-0.013
The nursing staff helped me manage the fears I had about my illness.	-0.117**	0.126**	0.104**	0.113**	-0.013	0.016	0.022	0.011
The nurses helped me feel at ease in the hospital.	-0.232**	0.184**	0.059**	0.169**	0.025	-0.009	0.025	0.006
The nurses' actions made me feel cared for.	-0.140**	0.122**	0.083**	0.098**	0.032	-0.005	0.031	0.001
Patient satisfaction index	**-0.172****	**0.143****	**0.125****	**0.132****	**0.000**	**0.039**	**0.008**	**0.042**

Table 4: Correlations between the patient satisfaction index as measured with the PPHEN[7] and the number of patients, the nursing staff hours, and the nursing care activities.
NA nursing assistant, RN graduated (registered) nurse, P partial correlation coefficient, r Pearson correlation coefficient, R Spearman's rho correlation coefficient
Nursing staff, includes RN and NAs
*Statistical significance ** < 0.00; * <0.050*
Correlation strength: 0-0.09 not correlated, 0.1-0.3 weak, 0.31-0.6 medium, 0.61-1 strong correlation [38]
PPHEN index, includes all 15 variables measuring patient satisfaction

Correlations

The PPHEN index was correlated negatively with the number of patients present daily at the unit level (p<0.000). Differently, the PPHEN index was correlated positively with the amount of nursing care hours per patient day (p<.000), significantly for both profiles (RNs, p<0.000; NAs, p<0.000). Higher correlations emerged between the patient satisfaction index with the RN hours/patients day (r =0.143), as compared to that provided by NAs (r= 0.125). Moreover, patients' satisfaction with nursing care was not significantly correlated with the frequency of nursing staff activities in general (R= 0.00, p= 0.698), while significant correlations emerged in some patients' satisfaction variables and

the frequency of direct patient care activities, as reported in Table 4.

Discussion

In the PPHEN index, patients reported high satisfaction with nursing care. Previous studies performed in the US using the PPHEN in settings where the amount of resources devoted to nursing care with RNs was near double reported a comparable average satisfaction index, from 4.0 to 4.5[7]. The high satisfaction perceived by our patients may reflect the paternalistic approach often characterising those in-transition countries, where patients believe that healthcare workers are doing their best with the limited resources available[30].

According to the aims of the study, we firstly explored the correlations between the patient satisfaction index and the number of patients cared for at the unit level. A significantly weak negative correlation emerged, suggesting that in overcrowded situations, patients perceive the difference in the nursing care received, thus suggesting that flexible schedules are needed to ensure the freedom to increase the number of nurses to deal with the increased number of patients.

Moreover, in line with the study aims, we explored the correlations between the amount of care delivered and the patient satisfaction. Specifically, a high proportion of nursing care (>61%) was offered by NAs, who are educated at the secondary school level. The few RNs available at the unit level were responsible for the entire nursing care process by planning the care of patients and supervising the NAs. In Slovenia, RNs and NAs are considered together as nurses; considering them as a whole, the nursing care resources seem not to deviate from those expected in EU hospitals(e.g., 40), while in reality, if we consider only RNs, they care for > 8 patients/shift.

According to the findings, patient satisfaction was positively correlated at weak levels to the amount of nursing care, mainly to that offered by RNs, thus suggesting that their increased presence at the unit level can impact the perception of patients. Weaker - but statistically significant - correlations emerged also between the patient satisfaction and the number of NAs, thus suggesting that patients value the role of RNs more and that their clinical competences acquired at the academic level can increase patient satisfaction.

The correlation between the activities performed by the nursing staff and the patient satisfaction, was also researched according to the study aims. Although Chang[41] documented that NAs carry out 83.6% of the same activities as RNs, in our study they performed significantly different activities. Moreover, those activities in contact with patients performed by RNs included <20% of all activities. Previous studies conducted in different countries and skill-mix contexts have reported that around 30% of RN activities involve contact with patients[1, 18].

Differently, the proportion of direct patient care activities performed by all nursing staff was higher (36.8%) than that documented previously, which was around 30%[28]. However, the majority of observed contacts included hands-on-care and were thus focused on the patient's physical needs (e.g., hygiene, food intake, mobility, medical/technical procedures), while a limited proportion of activities was devoted to regular patient observations, communication, or support. Similarly, Jinks and Hope[42] found that hospital nurses provide extremely small amounts of patient education.

According to the findings, patient satisfaction was not correlated with the frequency of in-contact care activities performed by the entire nursing staff, with the exception of three items, namely 'I was sure that nurses would be there when I needed them', 'Little things were done for me without asking', and 'The nurses thought ahead about what I needed', where weak positive correlations emerged.

Contrary to what is documented in studies in high-income countries[16, 20], where the time that nurses spend in direct care activities was discovered as a determinant of patient satisfaction, our patients seem to value the number of hours worked by nurses. This seems to be in line with the concept of caring that is based upon not only what nurses do at the bedside but also their caring thoughts, clinical judgment, and decisions-making processes, which are invisible by simple observation[15] but can impact the care offered to patients.

Strengths and limitations of the study

To the best of our knowledge, this is the first correlational study exploring the relationship between structural and process variables in a post-transition country where limited nursing care resources have been documented. Although the sample of nurses was appropriate because it was equal to the nursing population working at the unit level, a small number of patients were involved,

and some of them preferred to be supported in filling in the questionnaire or asked their relatives to fill it in. The PPHEN instrument used could be completed by relatives, but the participation of relatives may have introduced some information biases. In addition, some data regarding the individual characteristics of patients that could affect their perceptions regarding satisfaction with nursing care[6, 11, 12] were collected.

Different instruments have been reported in the literature aimed at measuring the nursing care processes; however, mostly of them have several limitations[43]. For this reason, we have used the observation at the unit level by involving nursing students, and information biases could have also occurred in this case. However, specific training was provided before data collection as well as a pilot phase. Moreover, some reflective strategies (e.g., debriefing sessions) aimed at accompanying nursing students' research participation to some learning outcomes (e.g., by reflecting on the value of direct nursing activities) were also offered.

This study was performed in a single centre, suggesting the need to develop multi-centre studies in the future. Moreover, given the Hawthorne effects(36), we selected only six days of observation out of the nine observed, which could have increased the reliability of the data, on the one hand, but could also represent wasted time, on the other hand. Furthermore, according to the instrument adopted, only data on the occurrence of each activity included in the tool were recorded; therefore, the duration of each activity (e.g., the length of communication with the patient) was not recorded. This should be addressed in the future, given that the duration of each activity can affect the amount of nursing activities performed.

Conclusions and implications for practice

This study has explored the correlation between the patient satisfaction with nursing care and the number of patients cared for in a medical unit, the amount of nursing care delivered, and the activities performed by the staff. Patient satisfaction with nursing care is high and negatively correlated at weak levels with the number of patients cared for at the unit's level, thus suggesting the need to tailor the nursing workforces in the case of patient overcrowding.

Patient satisfaction with nursing care is also positively correlated at weak levels with the amount of care delivered by RNs and, at the weakest levels,

to that delivered by NAs, suggesting that patients valued the presence of nurses educated at the academic level and report increased satisfaction when a high amount of care is delivered by RNs. Moreover, positive correlations emerged between patient satisfaction and some direct activities performed by all staff (RNs and NAs), while non-significant correlations emerged between patients' satisfaction and direct nursing care activities performed by RNs.

These findings seem to suggest that patients perceive the presence and the value of RNs not only when they are at the bedside. Their competences acquired at the academic level (e.g., clinical judgment, decisions-making processes, and caring thoughts) can affect the environment and the caring processes, and thereby the perceptions of patients, who in turn increase their degree of satisfaction. Therefore, in designing nursing care structure and processes, an appropriate number of nurses educated at the university levels is required in the teams; there is also a need to introduced strategies at the unit or department levels, aimed at dealing with the increased amount of patients admitted in medical units, aimed at preventing negative outcomes such as dissatisfaction.

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