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NANDA-I, NIC, and NOC taxonomies, patients' satisfaction, and nurses' perception of the work environment: an Italian cross-sectional pilot study

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Abstract. *Background and aim of the work:* Structured nursing care planning, patients' satisfaction with care, nurses' job satisfaction, and the characteristics of the work environment may influence each other and impact on the quality of hospital care. This study aimed at investigating the differences in nurses' perception of the work environment and patients' satisfaction with care, between two groups of hospital wards that used NANDA-I, NIC, and NOC taxonomies or not in the daily practice. *Methods:* A pilot cross-sectional study was conducted involving nurses employed in eight wards of a teaching hospital in central Italy and patients hospitalized in these wards. The 'Nursing Work Index Revised' and the 'Patient Satisfaction Scale' were used to investigate nurses' perception of the work environment and patients' satisfaction with care, respectively. *Results:* Significant better perceptions of both the constructs were highlighted in those wards that used nursing taxonomies. *Conclusions:* The application of a healthcare model based on the nursing process methodology should be empowered in the hospital settings, since it can influence the quality of the environment and patients' satisfaction with care. (www.actabiomedica.it)

Key words: NANDA-I, NIC, and NOC, nursing process, patient satisfaction, standardized nursing terminology, work environment perception

Background

The quality of care and its related factors, despite being an ancient topic (1, 2), is still investigated in the literature (3-6), also given its close relationship with the patient's safety (5, 7). However, considering the multiple factors that define quality of care, its measurement is rather complex, as earlier pointed out in 2006 by the World Health Organization (WHO), which identified six areas that describe more specifically the concept of quality of care: efficacy, efficiency, accessibility, acceptability (patient-centred care), equity, and safety (8). Therefore, several indicators of quality of care are available; they are classifiable as objective, e.g. mortality rate, incidence of failure to rescue, nurse-to-patient ratio (3, 5, 9), and subjective, e.g. both patients' and nurses' satisfaction (3-5). These latter seem to be particularly influenced by the characteristics of the work environment as well as the organizational models adopted in hospital settings (5, 10), such as care planning based on the nursing process, which facilitates a systematic and coherent approach to the needs of patients (11). In the literature, it is acknowledged that the increased utilization of taxonomic classifica-

tions supports nursing knowledge (12), also when they are used in an electronic format (13). This can lead to obtain more coherent, complete, and accurate nursing documentation (12) and globally improves the daily care practice, with beneficial effects also on the organizational environment (14). Consequently, care planning based on the nursing process is advantageous for patients who are actively involved in this methodology, which can also improve the continuity of their care from the hospitals to the home settings (15). Therefore, planning and systematically documenting the care process through standardized classifications, such as NANDA-I, NIC, and NOC (NNN) taxonomies, could help to more precisely evaluate nursing-sensitive healthcare outcomes (15) and lay the foundations for more effective control of health facilities' economic performances (16).

Aim of the work

Considering the lack of research on these issues in the Italian context where the utilization of standardized nursing classifications is still limited, the purpose of this study was to investigate the differences between two groups of hospital wards having used NNN taxonomies or not in the daily nursing care practice about: 1) nurses' perception of the work environment and 2) patients' satisfaction with the nursing care received.

Methods

Design

A pilot study with a cross-sectional approach was conducted according to the 'Strengthening the Reporting of Observational Studies in Epidemiology' (STROBE) guidelines (17).

Setting and sample

Eight wards of a teaching hospital in central Italy were included in the study through convenience sampling, involving both wards using NANDA-I, NIC, and NOC in daily care, labelled as 'NNN-Yes', and wards not using them, labelled as 'NNN-No'. In such wards, all employed nurses and patients hospitalized for, at least, 48 hours were asked to take part in the study.

Variables and data collection

Between July and September 2017, nurses' perception of the quality of the work environment and patients' satisfaction with the care received were investigated through the 'Nursing Work Index-Revised' (NWI-R) scale (18) and the 'Patient Satisfaction Scale' (PSS) (19), respectively. Moreover, sociodemographic variables were collected for nurses and patients.

The NWI-R scale was translated and underwent a cross-cultural adaptation process according to Beaton guidelines (20). The questionnaire consists of 15 Likert-type items to which nurses had to express their degree of agreement ranging from 1 (strongly disagree) to 4 (strongly agree). The scale provides information about four dimensions:

- Nurse autonomy, composed of 5 items concerning nurses' perception of their decision-making ability and skills for the care process;
- Nurse control, composed of 7 items investigating the control over the practice setting as perceived by nurses;
- Nurse-physician relationship, composed of 3 items concerning the self-evaluation of nurses' ability to collaborate with doctors;
- Organizational support, composed of 10 out of the 15 items derived from the other three dimensions. This dimension provides information regarding the evaluation of the instruments offered by the healthcare facilities to nurses in support of their professional activity.

The Italian validated PSS consists of 11 Likert-type items (19), as well as the original English version (21), to which patients had to express their level of agreement ranging from 1 (very dissatisfied) to 4 (very satisfied). The scale provides information about three dimensions:

- Satisfaction with technical and scientific needs, composed of 3 items concerning the perception of skills and professionalism of the staff;

- Satisfaction with information needs, composed of 5 items concerning the information received during the hospital admission, recovery, and discharge;
- Satisfaction with interaction and support needs, composed of 3 items concerning the overall perception of the quality of care received.

Ethical considerations

The study was jointly approved by University and Hospital boards where the study was conducted. All the participants were informed about the characteristics and aim of the research and provided their consent to participate. Moreover, data were collected and analyzed anonymously.

Data analysis

Descriptive and inferential statistics were carried out to represent data and test the research hypotheses, respectively. The homogeneity of continuous sociodemographic variables regarding nurses and patients between the two compared ward groups was checked through the t-test for independent samples or the Mann-Whitney U test, depending on the normality of data distribution assessed through the Kolmogorov-Smirnov test. The scores provided by nurses and patients through the Likert-type scales have been coded in dichotomous data, replacing the first and the last two Likert levels with 'negative perception' and 'positive perception', respectively. Hence, some likely differences in the distribution of all the categorical variables between the two groups of wards were checked through the χ^2 test. All the analyses were conducted using the SPSS software, version 19.0 (IBM Corp., Armonk, NY, USA), with an accepted statistical error ≤5%.

Results

Seventy-five nurses with a mean age of 38.2 years (SD 7.3; min 25; max 56), 72.0% of whom were female, and 212 patients with a mean age of 63.2 years (SD 15.9; min 18; max 97), 51.9% of whom were male, were enrolled in the study. The distribution of sociodemographic characteristics between the 'NNN-Yes' and 'NNN-No' ward groups regarding nurses and patients was homogeneous (Table 1).

As shown in Table 2, nurses working in the 'NNN-Yes' wards demonstrated a significantly better perception of the quality of the work environment compared to their colleagues employed in the 'NNN-No' wards for all the dimensions of the NWI-R scale except for the 'Nurse-physician relationship' ($p = 0.651$).

Similarly, patients hospitalized in the 'NNN-Yes' wards showed a significantly better satisfaction with the quality of daily care received compared to those admitted to the 'NNN-No' wards in all the dimensions of the PSS (Table 3).

Discussion

To our knowledge, this is the first Italian study investigating nurses' perceived quality of the work environment and patients' satisfaction with the care received in the hospital wards using NANDA-I, NIC, and NOC taxonomies or not. Results showed that the application of care models based on the nursing process was significantly associated with the perception of beneficial outcomes by nurses and patients, which probably influence each other (5, 9). In fact, the use of NANDA-I, NIC, and NOC taxonomies revealed to be clearly associated with a positive perception by nurses about the nursing care planification and professional independence, which are both specific features of the nursing process (11). According to the literature, a better perception of the quality of the organizational support, as detected in the 'NNN-Yes' ward group, seems to be strongly associated with the quality of nursing care and nurses' job satisfaction (22), confirming the role of the interaction between organizational factors and clinical practice in enhancing a healthy work environment that allows hospitals to provide good quality of care (5, 8, 18).

From the patients' point of view, a better perception of the quality of care in the 'NNN-Yes' ward group was detected in both the interaction with the healthcare workers and the work climate, even if the patients hospitalized in 'NNN-No' wards showed to

Table 1. Sample descriptive analysis. †*t-test for independent samples;* ‡χ^2 *test;* §*Mann-Whitney U test*

		NNN-Yes	NNN-No		*p-value*
Nurses (N=75)	**N**	40	35		
	Age, years				
	Mean (SD)	38.2 (7.1)	38.2 (7.7)		0.975†
	Min-Max	25-51	27-56		-
	Gender, %				
	Females	72.5%	71.4%		0.918‡
	Wards, %				
	Endocrinology	12.5%	*Emergency Medicine*	11.4%	
	Pulmonology	25.0%	*General Medicine*	20.0%	--
	Cardiological Clinic	35.0%	*Thoracic Surgery*	31.4%	--
	Haematological Clinic	27.5%	*General Surgery*	37.1%	--
	Total	100.0%	*Total*	100.0%	--
wPatients (N=212)	**N**	100	112		
	Age, years				
	Mean (SD)	63.2 (15.4)	63.3 (16.4)		0.821§
	Min-Max	20-97	18-90		--
	Gender, %				
	Females	53.5%	43.4%		0.139‡
	Wards, %				
	Endocrinology	24.0%	*Emergency Medicine*	11.6%	--
	Pulmonology	39.0%	*General Medicine*	23.2%	--
	Cardiological Clinic	26.0%	*Thoracic Surgery*	26.8%	--
	Haematological Clinic	11.0%	*General Surgery*	38.4%	--
	Total	100.0%	*Total*	100.0%	--

be quite satisfied with the quality of technical and relational aspects of the care received. Perhaps, this was due both to the influence of the bio-medical model on health perception and management and to the healthcare worker-patient empathy-based relationships. In fact, the biomedical model is still prevalent in guiding health-focused policy choices in the Italian national health service, and empathy is essential in the relationship with patients, independently of the healthcare model used (23).

Table 2. Work environment quality: positive and negative perceptions by nurses in 'NNN-Yes' and 'NNN-No' ward groups

		Positive perception		Negative perception		
	Analysed records	**NNN-Yes**	**NNN-No**	**NNN-Yes**	**NNN-No**	*p-value*
Nurse autonomy (7 items)	375	158 (79.0%)	108 (61.7%)	42 (21.0%)	67 (38.3%)	<0.001
Nurse control (5 items)	525	189 (67.5%)	111 (45.3%)	91 (32.5%)	134 (54.7%)	<0.001
Nurse-physician relationship (3 items)	225	101 (84.2%)	86 (81.9%)	19 (15.8%)	19 (18.1%)	0.651
Organizational support (10 items)	750	300 (75.0%)	203 (58.0%)	100 (25.0%)	147 (42.0%)	<0.001

Table 3. Satisfaction with the care received: positive and negative perceptions by patients in 'NNN-Yes' and 'NNN-No' ward groups

		Positive perception		Negative perception		
	Provided answers/ Analysed records	**NNN-Yes**	**NNN-No**	**NNN-Yes**	**NNN-No**	*p-value*
Satisfaction with the meeting of technical and scientific needs (3 items)	636	291 (98.0%)	322 (95.0%)	6 (2.0%)	17 (5.0%)	0.044
Satisfaction with the meeting of information needs (5 items)	1060	449 (90.7%)	412 (72.9%)	46 (9.3%)	153 (27.1%)	<0.001
Satisfaction with the meeting of interaction and support needs (3 items)	636	291 (98.0%)	319 (94.1%)	6 (2.0%)	20 (5.9%)	0.014
Total	2332	1031 (94.7%)	1053 (84.7%)	58 (5.3%)	190 (15.3%)	<0.001

The interprofessional communication was also perceived as efficient in both the compared groups, meaning that the management of collaborative problems probably does not need a specific methodology, such as the whole nursing process, contrary to what was highlighted by Guadarrama-Ortega and colleagues (13).

Instead, regarding the satisfaction with the fulfilment of the need for information, a larger difference between the two groups of patients was revealed, probably because limited or inadequate time was spent to fulfil these needs in the hospital settings that do not use standardized care processes.

Thereby, the application of the nursing process in the management of healthcare activities highlighted the specificity of the nursing care, which is not mainly focused on facing biological needs but takes into considerable account the psycho-relational aspects of care, favouring a holistic approach toward patients and their families (24-26) and an improvement of economic performances of healthcare facilities (5, 9).

The main limitation of this study was the convenience sample, for which the results should be considered cautiously. In addition, it was not possible to detect any other variable that, given the complexity of the health-

care setting, could have influenced the perception of both nurses and patients. However, we think that the methodology used in this study could be replicated in a broader dimension to keep under control any possible confounding bias.

Conclusion

Overall, the nurses' perception of the quality of the work environment and patients' satisfaction with care revealed to be significantly better in those wards that used NANDA-I, NIC, and NOC taxonomies in daily practice compared to those not using it. The application of a healthcare model based on the nursing process methodology should be empowered in the hospital settings, since it can enhance the quality of the work environment in hospital settings, which would improve patients' satisfaction with the nursing care received. Further studies are necessary to better understand the contribution of structured healthcare models to the improvement of Italian nursing care.

Conflict of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article

References

1. Lang NM. Issues in quality assurance in nursing. ANA Publ 1976; (G-124):45-56.
2. Nightingale F. 'I Have Done My Duty': Florence Nightingale in the Crimean War. Manchester University Press, Manchester, 1987.
3. Aiken LH, Sloane D, Griffiths P, Rafferty AM, Bruyneel L, McHugh M, et al. Nursing skill mix in European hospitals: cross-sectional study of the association with mortality, patient ratings, and quality of care. BMJ Qual Saf 2017; 26:559-68.
4. Hanefeld J, Powell-Jackson T, Balabanova D. Understanding and measuring quality of care: dealing with complexity. Bull World Health Organ 2017; 95:368-74.
5. Petrucci C, Calandro MT, Transulti F, Baldacchini A, Lancia L. [Relazioni tra nurse staffing e nursing outcomes: revisione narrativa della letteratura]. Prof Inferm 2015; 68:195-202.
6. Stimpfel AW, Rosen JE, McHugh MD. Understanding the role of the professional practice environment on quality of care in Magnet® and non-Magnet hospitals. J Nurs Adm 2014; 44:10-6.
7. Chau JP, Lo SH, Choi K, Chan EL, McHugh MD, Tong DW, et al. A longitudinal examination of the association between nurse staffing levels, the practice environment and nurse-sensitive patient outcomes in hospitals. BMC Health Serv Res 2015;15:538.
8. WHO - World Health Organization. Quality of care: a process for making strategic choices in health systems. WHO Regional Office for Europe, 2006.
9. Lancia L, Di Labio L, Petrucci C. [Relazioni tra gli aspetti principali che definiscono il concetto di carico di lavoro del personale infermieristico: revisione della letteratura]. Prof Inferm 2011; 64:3-10.
10. Cicolini G, Comparcini D, Simonetti V. Workplace empowerment and nurses' job satisfaction: A systematic literature review. J Nurs Manag 2014; 22:855-71.
11. Wilkinson JM. Nursing process: A critical thinking approach. Addison Wesley Publishing Company, London, 1996.
12. Strudwick G, Hardiker NR. Understanding the use of standardized nursing terminology and classification systems in published research: A case study using the International Classification for Nursing Practice®. Int J Med Inform 2016; 94:215-21.
13. Guadarrama-Ortega D, Delgado-Sánchez P, Martínez-Piedrola M, López-Poves E, Acevedo-García M, Nogueira-Quijada C, et al. Integration of the nursing process in the electronic health record in an university hospital. Rev Calid Asist 2017; 32:127-34.
14. Saranto K, Kinnunen UM. Evaluating nursing documentation–research designs and methods: systematic review. J Adv Nurs 2009; 65:464-76.
15. Rabelo-Silva ER, Dantas Cavalcanti AC, Ramos Goulart Caldas MC, Lucena AdF, Almeida MdA, Linch GFdC, et al. Advanced Nursing Process quality: Comparing the International Classification for Nursing Practice (ICNP) with the NANDA-International (NANDA-I) and Nursing Interventions Classification (NIC). J Clin Nurs 2017; 26:379-87.
16. Müller-Staub M, Needham I, Odenbreit M, Ann Lavin M, Van Achterberg T. Improved quality of nursing documentation: results of a nursing diagnoses, interventions, and outcomes implementation study. Int J Nurs Terminol Classif 2007; 18:5-17.
17. Von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP, et al. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: guidelines for reporting observational studies. Int J Surg 2014; 12:1495-9.
18. Aiken LH, Patrician PA. Measuring organizational traits of hospitals: the Revised Nursing Work Index. Nurs Res 2000; 49:146-53.
19. Tomietto M, Papastavrou E, Suhonen R, Leino-Kilpi H, Palese A. Italian validation of the Patient Satisfaction Scale. Ann Ig 2011; 23:195-202.
20. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. Spine 2000; 25:3186-91.

21. Kim H. Patient-nurse collaboration in nursing care decision making: American studies, Conference Proceedings of the International Nursing Research Conference, Nursing Research: Global Health Perspectives 1991; 399.
22. Van Bogaert P, Clarke S, Vermeyen K, Meulemans H, Van de Heyning P. Practice environments and their associations with nurse-reported outcomes in Belgian hospitals: Development and preliminary validation of a Dutch adaptation of the Revised Nursing Work Index. Int J Nurs Stud 2009; 46:55-65.
23. Hashim MJ. Patient-Centered Communication: Basic Skills. Am Fam Physician. 2017; 95:29-34.
24. Desborough J, Phillips C, Mills J, Korda R, Bagheri N, Banfield M. Developing a positive patient experience with nurses in general practice: An integrated model of patient satisfaction and enablement. J Adv Nurs 2018; 74:564-78.
25. Erickson HL. Holistic nurses' examinations: Past, present, future. J Holist Nurs 2009; 27:186-202.
26. Leino-Kilpi H, Jaana V. The patient's perspective on nursing quality: developing a framework for evaluation. Int J Qual Health Care 1994; 6:85-95.

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