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Benchmarking by the RAFAELA Patient Classification System - a Descriptive Study of Optimal Nursing Intensity Levels

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Abstract. *The overall aim of the RAFAELA system is that the personnel resources should be in balance with the patients' caring needs, i.e. when the nursing intensity per nurse is on the optimal level of the unit. The RAFAELA system consists of three parts: the OPCq (Oulu Patient Classification Qualisan) instrument for measuring the nursing intensity, registration of the daily nursing resources and the PAONCIL (Professional Assessment of Optimal Nursing Care Intensity Level) method. The aim of this paper is (1) to describe the structure of benchmarking with the RAFAELA system and (2) to present comparisons of optimal nursing intensity levels in Finnish hospitals by using data from RAFAELA benchmarking reports in 2001. Totally 86 wards from 14 different hospitals in Finland took part in the study, the optimal nursing intensity had been decided for 53 wards. Data was analyzed using descriptive statistics. The average workload was on adult wards 25.2 NCI points per nurse. The optimal NCI was exceeded during 48% of the days and under during 22% of the days. An imbalance between nursing intensity and personnel resources clearly affects the care quality and the results. Benchmarking with the RAFAELA system provides nurse managers with many opportunities in their decision processes in human resource management.*

Keywords: nursing intensity, patient classification system, workload, benchmarking

1. Introduction

The overall aim of the RAFAELA system is that the personnel resources should be in balance with the patients' caring needs, i.e. when the nursing intensity per nurse is on the optimal level of the unit [1]. The RAFAELA system consists of the OPCq (Oulu Patient Classification Qualisan) instrument for measuring the nursing intensity, registration of the daily nursing resources and the PAONCIL method (Professional Assessment of Optimal Nursing Care Intensity Level) [2]. The aim of systematic benchmarking, developed through the RAFAELA system, is to produce exact results concerning nursing intensity (NI), personnel resources and factors influencing costs, in order to be able to compare the resource allocation, productivity, quality and costs of nursing care between organizations. Benchmarking is a fashionable word within many branches today, but within nursing care and nursing research, systematic benchmarking is fairly undeveloped and has not been researched. The basic idea with benchmarking as a method for developing an organisation is to learn from others and preferably "from the best" of the organisations that can show the best results within the area [3] [4]. What could be a good resource allocation within nursing care? During the period 1994 – 2000 a new PCS, the so called RAFAELA system, was developed in Finland. Already at the end of the 1990s the RAFAELA system had spread to approximately fifteen hospitals. In order to standardise, test the credibility of the system, the Association of Finnish Regional and Local Authorities decided to start a large research

project [5]. One important aim during the project time was to develop and commence a systematic benchmarking activity within nursing care [6]. Today information is collected annually from the units participating (about 430 units) in the national benchmarking system. After that, benchmarking reports are made and are then available for the users and executives and politicians on different levels of the organisations.

The aim of this paper is (1) to describe the structure of benchmarking with the RAFAELA system and (2) to present comparisons of optimal nursing intensity levels in Finnish hospitals by using data from RAFAELA benchmarking reports in 2001.

2. Benchmarking by he RAFAELA system

The RAFAELA system has been developed based on a holistic view of man, a view of leadership based on human resource management and on the idea that nursing care consists of complex nursing care units [1]. The RAFAELA system consists of three parts: I. Patients' nursing intensity (NI) measured daily by the OPCq and; II. the daily nursing resources, that have directly or indirectly been allocated to patients' nursing care. By using these two sets of data, a measure of nurses' workload as Nursing Intensity points per nurse (NI/N) is obtained. III. The optimal level of NI workload is then established simultaneously using the PAONCIL method for several weeks [7] [8]. The basic idea of the RAFAELA system is that the workload expressed as NI per nurse is compared with the optimal NI level for the ward. The validity of the OPCq instrument has been tested several times, with good results [1] [8]. Both content validity and construct validity of the OPCq instrument have been tested. The perquisites for achieving reliable results by the PAONCIL method have been determined [7] [8]. The RAFAELA system has now been developed to also include nursing care on out-patients' departments, psychiatric nursing care and primary health care. NI is supposed to be a large part of the nurses' workload, but there are also many other factors simultaneously affect the nurses' total workload, for example the organising of work, skill mix, organisational factors, total workload [9]. The critical indicators consisted of two larger data units, i.e. ward-related information and information on NI (see table 1).

Table 1. Critical indicators for benchmarking with the RAFAELA-system

	Indicators	Examples
A.Ward-related information	Type of activity/specialized area,	Geriatric, surgery, neurology, paediatrics, internal medicine
	The ward activity character	Beds per ward, opening hours, possible closures, weekday ward
	Central patient groups	Medical diagnoses
	Organisation of the nursing care	Module working, primary nursing
	Personnel employment structure /skill mix	Head nurse, registered nurses, practical nurses, assisting personnel
	Nursing personnel wage costs, both according to budget and the	

	accounts Reliability percent for nurses' classifications for each ward.	Divided into regular salaries, salaries for extra personnel, extra compensations > 70 %
B. Information on nursing intensity (NI)	The daily NI The NI/N and per ward The hospital stays related to each patient	NI per patient and calendar day, NI per areas of needs (A-D), the patient's sex and age etc. Optimal NI level, exploratory power of the PAONCIL study, NI/N and per calendar day Diagnose Related Group (DRG) and length of the hospital stay.

3. Material and methods

Totally 86 wards from 14 different hospitals in Finland took part in the study. These 14 hospitals were divided into three different categories: 1. University hospitals (E, L, M); 2. Regional hospitals (A, B, C, I, K, N); 3. Local hospitals (D, F, G, H, J). The included specialized areas are presented in Table 2 and 3. From a total of 86 participating wards, the optimal NI level had been decided for 53 wards (62%; not for hospital E, J and L). Data was analyzed using descriptive statistics. The study was performed within the frames of the national research project "Finnish Nursing Care Intensity – benchmarking within nursing care" and the data were gathered from the period of 1.1 – 31.12.2001. The data material from the 86 wards consisted of 576 883 nursing intensity classifications for approximately 100 000 patients and 85 000 periods of hospital stay [5] [6]. Along with NI and associated data much additional data of the characteristics of the wards, economic data etc. was collected (see Table 1). The statistical program package SPSS for Windows 10.0 and the MS Excel 2000 spreadsheet program were used to analyse the material. To protect patient confidentiality the data were treated entirely anonymously (cr. Helsinki Declaration).

4. Results

The analyses show fairly large variations concerning the work load of the nurses both between specialized areas and between hospitals. The NI per nurse was on average lowest on children's wards (mean 15.1 points) and highest on mixed wards (27.1 points). The average work load on adults' wards was 25.2 NI points. The NI per nurse was analysed in relation to the fixed optimal NI level of each ward and Table 2 show the number of days in percentage when the NI per nurse were above the optimal level (per specialized areas and per hospital). The optimal NI level was exceeded during 48% of the days. The situation on the five neurological wards was extremely problematic (89%); the work situation was also problematic for the nurses on the internal medicine (67%) and on the mixed wards (61%).

Table 2. Number of days in % when the NI per nurse were over optimal level, per specialized areas and per hospital.

Specialized areas	A	B	C	D	F	G	H	I	K	M	N	Mean
Dermatology				42								42
Gynecology-obstetrics								24	0		41	22
Surgical						34		40		63	39	43
Neurology	84	19						93				89
Oncololgy		49									43	46
Ortopedic-Traumatology		8				84		67	34	68	70	55
Paediatrics A	41	18							52	33	26	34
Paediatrics B							78			56		67
Paediatrics C			3						32			18
Pulmonary										42		42
Rheumatology		58					22			18		33
Mixed wards				43					73		67	61
Internal medicine					98	32		73			65	67
Mean	63	30	3	43	98	50	50	59	38	47	50	48

Table 3. Number of days in % when the NI per nurse were under optimal level, per specialized areas and per hospital.

Specialized areas	A	B	C	D	F	G	H	I	K	M	N	Mean
Dermatology				19								19
Gynecology-obstetrics								29	87		21	46
Surgical						22		14		14	16	16
Neurology	1	2						2				1
Oncololgy		14									24	19
Ortopedic-Traumatology		49				4		6	23	2	4	15
Paediatrics A	11	44							19	31	25	26
Paediatrics B							9			18		13
Paediatrics C			74						35			54
Pulmonary										18		18
Rheumatology		19					37			57		38
Mixed wards				16					7		8	10
Internal medicine					0	16		4			4	6
Mean		26	74	17	0	15	23	11	34	23	14	22

A corresponding analysis concerning the NI per nurse in relation to the lower limit of the optimal level shows that the workload was below the optimal level on average during 22% of the days (see Table 3). NI per nurse was below the optimal level only during 1% of the days on the neurological wards. Concerning the internal medicine wards, the number was 6% and on mixed wards it was 10%.

5. Conclusion

An imbalance between NI and personnel resources clearly affects the care quality and the results. Current research shows that there is a clear connection between nurse staffing and key outcomes, such as complaints, infections, length of stay, thrombosis, shock and failure to rescue [10]. Aiken et al [11] large survey showed that poor staffing associated with higher mortality and failure to rescue. High work load are also associated with factors, such as burn out, low job satisfaction and sick leaves [12]. An assumption is, that resource allocation based on NI is a condition for qualitative nursing care. Benchmarking with the RAFAELA system provides nurse managers with many opportunities in their decision processes in human resource management.

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