



Nursing dimensioning in nephrology

Dimensionamiento de enfermería en nefrología

Dimensionamento de enfermagem na nefrologia

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Abstract

The aim was to compare the dimensioning of nursing staff proposed by Raquel Rapone Gaidzinski, Fernanda Maria Tojeiro Fugulin and Valéria Castilho on "MANAGEMENT IN NURSING" coordinated by Paulina Kurcgant with the guidelines of the Resolution of the Collegiate Board of Directors - RDC No. 154 of June 15th, 2004. This is a retrospective and descriptive study of the dimensioning of the nursing team working in the Hemodialysis Service of a University Hospital in the Municipality of Campinas. The comparison between the existing nursing staff in the Hemodialysis Service of the Hospital of the Municipality of Campinas and the projected one showed a shortage of 9 nurses, absence of 4 assistants and an excess of 2 nursing technicians. The analysis of the intervening variables in the nursing process indicated the need to reorganize the work process regarding the grouping of patients by complexity, suggesting the application, adaptation and validation of an instrument in hemodialysis.

Descriptors: Dimensioning; Nursing; Hemodialysis; People Management; Renal Sustainable Therapy.

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Resumén

El objetivo fue comparar el dimensionamiento del personal de enfermería propuesto por Raquel Rapone Gaidzinski, Fernanda Maria Tojeiro Fugulin y Valéria Castilho sobre "GESTIÓN EN ENFERMERÍA" coordinado por Paulina Kurcgant con los lineamientos de la Resolución de la Junta Directiva Colegiada - RDC No. 154, de 15 de junio de 2004. Se trata de un estudio retrospectivo y descriptivo del dimensionamiento del equipo de enfermería que trabaja en el Servicio de Hemodiálisis de un Hospital Universitario de la Municipio de Campinas. La comparación entre el personal de enfermería existente en el Servicio de Hemodiálisis del Hospital del Municipio de Campinas con el proyectado, mostró una escasez de 9 enfermeras, ausencia de 4 auxiliares y un exceso de 2 técnicos de enfermería. El análisis de las variables intervinientes en el proceso de enfermería indicó la necesidad de reorganizar el proceso de trabajo en cuanto a la agrupación de pacientes por complejidad, sugiriendo la aplicación, adaptación y validación de un instrumento en hemodiálisis.

Descriptores: Dimensionamiento; Enfermería; Hemodiálisis; Gestión de Personas; Terapia de Reemplazo Renal.

Resumo

Objetivou-se comparar o dimensionamento de pessoal de enfermagem proposto por Raquel Rapone Gaidzinski, Fernanda Maria Tojeiro Fugulin e Valéria Castilho sobre "GERENCIAMENTO EM ENFERMAGEM" coordenado por Paulina Kurcgant com as diretrizes da Resolução da Diretoria Colegiada – RDC n.º 154, de 15 de junho de 2004. Trata de um estudo retrospectivo e descritivo do dimensionamento da equipe de enfermagem atuante no Serviço de Hemodiálise de um Hospital Universitário do Município de Campinas. A comparação entre os quadros de pessoal de enfermagem existente no Serviço de Hemodiálise do Hospital do Município de Campinas ao projetado, demonstrou carência de 9 enfermeiras, ausência de 4 auxiliares e excesso de 2 técnicos de enfermagem. A análise das variáveis intervinientes no processo de enfermagem apontou a necessidade de reorganização do processo de trabalho referente ao agrupamento de pacientes por complexidade sugerindo a aplicação, adaptação e validação de um instrumento na hemodiálise.

Descritores: Dimensionamento; Enfermagem; Hemodiálise; Gestão de Pessoas; Terapia Renal Substitutiva.

Introduction

Chronic Kidney Failure (CKF) has become an important public health problem, as each year the number of people with this disease who require Kidney Replacement Therapy (KRT) grows significantly each year, not showing any signs to set limits within the next two decades.¹

According to the Brazilian Society of Nephrology (SBN) Hypertension and Diabetes Mellitus account for 50% of dialysis patients. In the United States, hypertension and diabetes mellitus are responsible for ¾ of dialysis patients, which can be partially explained by the number of elderly people in developed countries.²

In Brazil, changes have been taking place in terms of the average age of the population. Currently, the estimated number of elderly people in Brazil is 14.5 million and it is estimated to double in 20 years. In addition to aging, the number of undiagnosed and untreated diabetic and hypertensive patients is high.³

It is estimated that 25% of the Brazilian population has Hypertension, that is, 26 million people. Only 15% have properly controlled blood pressure, thus 85% have the potential to develop into CKD (Chronic Kidney Disease). In Brazil and Latin America 15% of dialysis patients are diabetic and the mortality rate of these patients is known to be higher than that of non-diabetics, due to the lack of vascular

development of these patients at the beginning of hemodialysis (arteriosclerotic process).^{4,5}

The high incidence of diabetic nephropathy is due to the increased incidence of type II diabetics in the general population, resulting from the obesity epidemic. It is estimated that 20 to 45% of diabetic patients developed diabetic nephropathy after 10 – 15 years of observation. Furthermore, in Brazil, among individuals over 20 years of age, 30 million are overweight and of this total, more than 10 million are considered obese, which is another risk factor for CKD.⁶

The SBN revealed that in Brazil there are more than 87,044 patients in a dialysis program in 2008, an increase of approximately 9% in recent years, with an incidence rate of 175 pmp and prevalence of 383 pmp. These prevalence rates in Brazil are about four times lower than in the United States and Japan, and twice as low as in Italy, France, and Germany. This is due to the low rate of early diagnosis of CKD, limited access to RRT, high mortality of diabetic and hypertensive patients still in the pre-dialysis phase.²

Therapeutic modalities are complex, varied and represent a health problem of wide magnitude and relevance, especially when its complexity, risks, diversity of options and cost are recognized. The dialysis units offer hemodialysis and peritoneal dialysis in an effective, efficient and safe way, adapted to the local reality. For this to occur,



the rational use of resources is imperative. In this way, the results are now measured and evaluated, and the beneficiaries are the citizens, the professionals responsible for providing assistance and the buyers of the services.⁷

From this perspective, this study aims to compare the nursing staff dimension proposed by Raquel Rapone Gaidzinski, Fernanda Maria Tojeiro Fugulin and Valéria Castilho in Chapter 10 of "MANAGEMENT IN NURSING" coordinated by Paulina Kurcgant with the guidelines of the Resolution of the Collegiate Board of Directors - RDC number 154 of June 15th, 2004, which establishes the technical regulation for the operation of dialysis services.⁸⁻¹⁰

Methodology

This is a retrospective and descriptive study of the dimensioning of the nursing team working in the Hemodialysis Service of a University Hospital in the city of Campinas and compares the dimensioning proposed by Raquel Rapone Gaidzinski with the Ministry of Health Ordinance, Resolution of the Collegiate Board of Directors No. 154 of June 15th, 2004.⁸⁻¹⁰

The multidisciplinary team is led by a nephrologist and a nephrologist nurse, who are technically responsible for the service. The team consists of 10 doctors (07 nephrologists and 03 nephropediatricians), 04 nurses, 03 resident doctors (02 nephrologists and 01 nephropediatrician), 02 resident nurses, 09 nursing assistants, 15 nursing technicians, 02 nutritionists (adult and pediatric), 01 social worker and 01 psychologist. The support areas (laundry, maintenance, materials center, clinical analysis laboratory, diagnostic imaging, among others) correspond to those designated to support the entire hospital community.

The Nephrology and Dialysis service of a University Hospital in the city of Campinas is an intra-hospital unit, belonging to the hospital, with a capacity for 92 patients insured with the Unified Health System and 12 patients with

other private and private health insurance plans. It has a Nephrology Outpatient Clinic, Vascular Access, Peritoneal Dialysis, Pre-Transplantation, Transplantation, Nutrition, Psychology and Social Work for both adults and children.

Most admissions come from inpatient and emergency care units, which reflects a high incidence of patients with a central venous catheter as a vascular access for hemodialysis and a high incidence of mortality, due to the severity with which these patients are admitted.

Data were collected by the researcher from face-to-face scales of the nursing staff of the Hemodialysis Service of a University Hospital in the city of Campinas from January 2007 to December 2007 during the different work shifts.

After obtaining the variables, they were applied in nursing staff dimensioning equations according to Gaidzinski and the results were compared to Collegiate Board Resolution No. 154 of June 15th, 2004.^{8,9} They will be presented in absolute numbers and percentages, in the form of a discussion. The study will benefit the institution by providing subsidies to scale the nursing staff in hemodialysis.

In addition, the results found will be published in congresses, scientific events, and publication in a scientific journal.

This study was submitted for evaluation and approval by the Research Ethics Committee of the Pontifical Catholic University of Campinas, protocol number 146/08 and the consent of the board of directors of the Celso Piirro de Campinas Hospital and Maternity - SP.

Results

Considering as foreseen absences the days related to days off and vacations, unplanned absences the days related to absences, leaves and suspensions in the period from January 2007 to December 2007, the table below highlights in detail the following professionals: nurses, technicians, and nursing assistants.

Chart 1. Specifications of foreseen absences the days related to days off and vacations, unplanned absences the days related to absences, leaves and suspensions in the period from January 2007 to December 2007. Jau, SP, Brazil, 2008

Category	Vacation	Leaves	Absences	Medical Certificates
Nurse	120 days	2 days	0 days	14 days
Technician	330 days	30 days	0 days	78 days
Assistant	333 days	10 days	24 days	79 days
Total	783 days	42 days	24 days	171 days

Applying the equation to scale nursing staff

$$A_f \% = \left(\frac{N_f}{DF - N_f} \right) \cdot 10$$

$$\sum_j (n_j \cdot h_j) = \text{Soma dos } j \text{ produtos } (n_j, h_j), \text{ isto é } (n_{\text{mínimo}} \cdot h_{\text{mínimo}}) + (n_{\text{intermediário}} \cdot h_{\text{intermediário}}) + (n_{\text{semi-intensivo}} \cdot h_{\text{semi-intensivo}}) + (n_{\text{intensivo}} \cdot h_{\text{intensivo}}).$$

$$q = \sum_k \frac{P_k}{100} \cdot \frac{\sum_j (n_j \cdot h_j)}{t \cdot p} \cdot \left[\left(1 + \frac{e}{d - e} \right) \cdot \left(1 + \frac{f}{D - f} \right) \cdot \left(1 + \frac{v_k}{D - v_k} \right) \cdot \left(1 + \frac{a_k}{D - a_k} \right) \right]$$

Therefore:

q: total number of nursing staff.

Pk: percentage proportion of category k.

k: professional category.

nj: average daily number of patients who need the type of care.

j: type of care required by the patient.

h: average care time of each patient in need of care.

t: daily working time of each professional, given in hours.

p: average productivity (daily working time dedicated to patient care).

e: number of weekly days off that require coverage.

f: number of public holidays per year that do not coincide with Sunday.

vk: number of vacation days per year, by professional category.

ak: average number of days of unplanned absence (absenteeism) by professional category.

d: days of operation of the unit (in this case 6 days).

D: days worked in the year (in this case 365 days).

The calculation of the nursing staff was performed by entering the data collected in a spreadsheet, which facilitates the operationalization of the equation, provided by Profa. Dr. Raquel R. Gaidzinski and the steps of this calculation were stored in a database. The dimensioning of nursing staff performed according to the Gaidzinski model indicated a total of 13 nurses, 13 technicians and 13 nursing assistants. The comparison between the existing nursing staff in the Hemodialysis Service of the Hospital of the Municipality of Campinas with the projected one, showed a shortage of 09 nurses, absence of 04 assistants and an excess of 02 nursing technicians.

The data obtained at the Nephrology and Dialysis Service of the Hospital da PUC de Campinas were applied in Profa's equation. Dra. Raquel R. Gaidzinsk and compared with the nursing staff dimensioning table of the Resolution of the Collegiate Board of the Ministry of Health No. 154:

1. Classification of patients: according to Resolution COFEN/2004.
2. 30% technical safety index.
3. Weekly credit hours: 36 hours.
4. Productivity: 80%.
5. Percentage of each professional category: minimum/intermediate - 33% to 37% nurses and the rest technical and nursing assistants, semi-intensive - 42% to 46% of nurses and the rest technicians and nursing assistants, intensive - 52 % to 56% of nurses and the rest technicians and nursing assistants.

The classification instrument was not applied since the instruments found were never tested in a hemodialysis unit as they did not characterize the profile of this clientele.

As the grouping of patients by care complexity classification system, in addition to improving the quality of care provided, it is also feasible to allocate human and material resources, reducing the cost of nursing care.

The chronic client aged over 60 years, without a companion, classified as requiring intermediate or semi-intensive care, must be increased by 0.5 to the hours of nursing specified in Article 4 of Resolution No. 293/2004 and the distribution percentage of the total number of nursing professionals, the following proportions must be observed, in addition to the classification of patients in minimum or intermediate care, 33 to 37% of nurses (minimum of 06) and the others, nursing assistants and technicians; in semi-intensive care from 42 to 46% nurses and other nursing assistants and technicians; in intensive care 52 to 56% nurses and other nursing technicians; The distribution of professionals by category should follow the most prevalent group of patients.

According to COFEN Resolution No. 293/2004, the methodology for calculating nursing staff, for the dialysis service clientele, fits into semi-intensive and/or intensive care, considering its degree of prevalence, its assistance is semi-intensive.

Discussion

Nursing work, as part of the collective work in health, presented above, takes place in different health institutions, whether public or private, characterized by the admission of individuals or not. In these institutions, in which the health production process centered on the purpose of controlling diseases on a social scale and recovering the incapacitated workforce predominates, nursing work is configured as an instrument of health work, acting on the same object and reproducing the clinical model of organization of this process, as it is primarily concerned with the individual care of bodies.¹¹

Researches¹²⁻¹⁷ on nursing staff dimensioning were developed, however, none of them aimed at patients on dialysis therapy, so this study highlights the need to adapt an instrument to classify the real complexity of patients with end-stage renal failure in a hemodialysis program.

The forecast of people for nursing activities in hospitals is a problem that is fundamentally based on the determination of the professional category that the institution is willing to hire and on the definition of its functions, which, in turn, depends on the philosophy and institutional policy, as well as the concept that management has of nursing.¹⁵



Exhaustive studies aimed at calculating the nursing staff have been developed over the years to establish a method that fits the real needs of different services. The count of the number of occupied beds, the proportionality of nursing staff and the patient/average hour of nursing care ratio have been tried as parameters for the sizing of nursing staff.^{8,17}

The predominance of the nurse's managerial work process can be understood by the scarce number of professionals in the composition of the workforce.¹⁸

It is noteworthy that, despite the study carried out showing that, by applying the Gaidzinski model, the nursing staff of the hemodialysis unit of the Hospital da PUC de Campinas is out of step with the need for assistance to hemodialysis patients, although it falls under the ordinance current RDC No. 154. The causes attributed to this perception are lack of an instrument adapted to hemodialysis patients to measure its real complexity, while they are being considered semi-intensive at sometimes it becomes intensive and at others, intermediary; delays in replacing medical and maternity leave; precariousness of professionals trained in this specialty, increasing training time.

The study allowed us to conclude that the existing framework in the clinic respects and even slightly surpasses that recommended by COFEN Resolution No. 293/2004.

Final Considerations

The comparison between the existing staff in the Hemodialysis Service of the Hospital da PUC de Campinas and the projected one, showed a shortage of 09 nurses, 04 nursing assistants and an excess of 02 nursing technicians.

Analysis of the intervening variables in the nursing process pointed out the need to reorganize the work process regarding the grouping of patients by complexity, suggesting the application, adaptation, and validation of an instrument in hemodialysis, which would demonstrate the time devoted to providing nursing care to hemodialysis patients.

However, the nursing team often reports that there is a great workload, having the perception that the unit's staff is smaller than necessary. They are often subjected to inappropriate continuous work of physical and psychological origin, causing them physiological disorders. This may perhaps be one of the reasons for the high rate of absenteeism and unplanned leave.

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