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ORIGINAL ARTICLE

THE NURSING TEAM DIMENSIONING IN THE MEDICAL CLINIC OF A TEACHING HOSPITAL INSTITUTION

DIMENSIONAMENTO DA EQUIPE DE ENFERMAGEM NA CLÍNICA MÉDICA DE UMA INSTITUIÇÃO HOSPITALAR DE ENSINO

DIMENSIONAMIENTO DEL EQUIPO DE ENFERMERÍA EN LA CLÍNICA MÉDICA DE UNA INSTITUCIÓN HOSPITALARIA DE ENSEÑANZA

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ABSTRACT

Objective: to collect data and information to subsidize the nursing staff dimensioning in the medical clinic unit of the University Hospital of Brasília. ***Method***: this is a descriptive study with a quantitative approach. The analysis of the data was performed from the statistics by the sum of the scores after the classification of the patients by need of care, multiplied the necessary hours for each patient in the 24 hours and calculated the amount of personnel. ***Results***: there is a higher prevalence of patients with minimal care, average number of staff calculated was 60, 20 nurses and 40 nursing technicians. ***Conclusion***: the application of a study on nursing personnel dimensioning helps to make decisions regarding the need and allocation of human resources. ***Descriptors***: Personnel Dimensioning; Human Resources; Nursing Care.

RESUMO

***Objetivo*:** coletar dados e informações para subsidiar o dimensionamento da equipe de enfermagem na unidade de clínica médica do Hospital Universitário de Brasília. ***Método*:** estudo descritivo-aplicado, de abordagem quantitativa. A análise dos dados foi realizada a partir da estatística pela soma dos escores após a classificação dos pacientes por necessidade de cuidado, multiplicadas as horas necessárias para cada paciente nas 24 horas e calculada a quantidade de pessoal. ***Resultados*:** maior prevalência de pacientes de cuidados mínimos, quantidade de pessoal média calculada igual a 60, sendo 20 enfermeiros e 40 técnicos. ***Conclusão*:** a aplicação de estudo sobre dimensionamento de pessoal de enfermagem auxilia a tomada de decisões quanto à necessidade e alocação de recursos humanos. ***Descritores*:** Dimensionamento de Pessoal; Recursos Humanos; Cuidados de Enfermagem.

RESUMEN

***Objetivo*:** recoger los datos e informaciones para subsidiar el dimensionamiento del equipo de enfermería en la unidad de clínica médica del Hospital Universitario de Brasília. ***Método*:** estudio descriptivo-aplicado, de enfoque cuantitativo. El análisis de los datos fue realizada a partir de la estadística por la soma de los puntos después de la clasificación de los pacientes por necesidad de cuidado, multiplicado por las horas necesarias para cada paciente en las 24 horas y calculado la cantidad de personal. ***Resultados*:** mayor prevalencia de pacientes de cuidados mínimos, cantidad de personal média calculada igual a 60, siendo 20 enfermeros y 40 técnicos. ***Conclusión*:** la aplicación de estudio sobre dimensionamiento de personal de enfermería auxilia a la tomada de decisiones para la necesidad y alocación de recursos humanos. ***Descriptores*:** Dimensionamiento de Personal; Recursos Humanos; Cuidados de Enfermería.

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INTRODUCTION

The nursing service in health care institutions, especially hospitals plays a fundamental role in the care process.[1] For this category of professionals provide assistance with quality and meet the needs of the patients, staffing becomes an object of constant concern, especially by the nurse who performs activities of the managerial work process, with dimensioning as one of his functions.[2-4] This theme can generate difficulties for economic, political or institutional reasons.

The nursing personnel dimension is the initial stage of the staffing process, since through this tool, the number of professionals by category, required to meet the needs of nursing care, directly or indirectly to patients. Predicting the number of staff is a process that depends on several factors, including knowledge of the workload in the hospitalization units, which varies according to the patients' care needs and the desired standard of care.[3] The aspects considered in the forecast of the number of personnel are contained in Article 2 of the Resolution of the Federal Nursing Council (COFEN) n° 293/2004, which deals with the quantification and quantification adequacy of nursing professionals and should consider characteristics related to the Institution/company, such as its mission, physical and organizational structure, size, types of services and/or programs, technology and complexity of services and staff policies, materials and financial resources.[6]

One of the factors to be considered in the calculation of dimensioning is the workload of the nursing care unit, which is the result of the average daily amount of patients assisted, the degree of dependency of assistance expended by the team and the average time demanded per patient., it is important to classify the patients to assess the average number of patients assisted in relation to the degree of care dependency to obtain the number of hours needed to provide assistance during 24 hours.[7]

Therefore, a patient classification tool is used, which is necessary for nursing management to support planning and decision making regarding human resources allocation, productivity monitoring; costs of nursing care; organization of services. An instrument called Patient Classification System (SCP) was developed to carry out this process that, after adjustments, currently includes five levels of care according to the complexity of care: intensive, semi-intensive, high dependency, intermediate and minimum. The system was endorsed by COFEN, in Resolution Nº 293/04, without contemplating the level of high dependence. The system collaborated in the evaluation of the real assistance needs in hospitalization units and established that the implantation is the nurse´s responsibility.[3,6,7]

In the choice of an instrument among the several existing in the literature, it is important to choose one that considers the operational aspects, medical practices and care standards of each institution. The SCP endorsed by Resolution Nº 293/04 is proposed by Fugulin (1994).[8] However, this author later identified that this instrument did not include parameters that would enable the evaluation of the different types of cutaneomucous lesions, as well as the degree of attention and time Demanded to perform dressings. This prompted her to carry out a study with the objective of complementing the previous instrument, contemplating the need for nursing care to care for injuries.[7]

After completing the instrument, the areas of care included in the instrument are mental state, oxygenation, vital signs, motility, ambulation, feeding, corporal care, elimination, therapy, cutaneomucous integrity/tissue compromise, dressing and time used in its achievement. The areas of care present in this instrument are the most adequate for the place of this study, besides being this instrument the most current in the literature, therefore being the instrument of choice.[7]

In the personnel dimensioning, it is also necessary to collect the data on the absenteeism rate and the rate of benefits of the nursing team, as they are important data to determine the Technical Security Index (STI), which is a percentage to be increased in the formula of calculation of personnel and it has the purpose of guaranteeing the absence of personnel such as special leave, holidays, medical leave, maternity leave, removals granted by the institution for family support, professional improvement, disgust, marriage, and birth. According to Resolution COFEN-293/2004, health establishments must establish a Technical Safety Index not less than 15%.

A mathematical calculation is used to carry out the personnel dimensioning where basic data are needed, among them the type of patient that is attended in each unit, characterized by its degree of dependence on the care provided by the nursing team, analyzed by the systematized classification of patients instrument application. Due to the lack of knowledge about the degree of nursing

care dependency of the patients attending the University Hospital of Brasília (HUB), the study is justified by carrying out the collection of these data necessary for the calculation of the dimension, which are extremely important for people management for the planning of nursing care and the organization of the therapeutic space, contributing to the provision of quality assistance.

OBJECTIVES

- To collect data and information to subsidize the nursing staff dimensioning in the hospitalization unit of the medical clinic of the University Hospital of Brasília.
- To check the absenteeism rate.
- To determine the occupancy rate.
- To quantify the number of nursing professionals quantified after the determination of the necessary indexes for the application of the calculation formula of the nursing team according to Resolution COFEN293/2004.

METHOD

This is a descriptive study with a quantitative approach.[10-1] The place of the study was the hospitalization unit of the HUB medical clinic, chosen as the hospital with the largest number of beds and being a reference for other sectors, such as Emergency and Ambulatory. It is located in the city of Brasília, Federal District. This unit has 68 beds, and it is subdivided into two wings, A and B, each with its rank and daily scale of nursing staff.

During the period of the research, this institution underwent a transition phase, with new management, assumed by the Brazilian Company of Hospital Services (EBSERH), a public company created by Federal Law 12,550, dated December 15, 2011, with Bylaws approved by Decree Nº 7.661, of December 28, 2011.

EBSERH´s mission is to guarantee the necessary conditions for federal university hospitals to provide excellent assistance in meeting the population´s health needs, in accordance with the guidelines of the Unified Health System (SUS) and to provide adequate conditions for the generation of Knowledge of the quality and training of the professionals of the various courses in the health area of the universities to which they belong.[12]

The research was approved by the head of nursing, of the Assistant Management of Education and Research (GAEP) of the HUB. After approval by the GAEP, the research was approved by the Research Ethics Committee (CEP) of the Health Sciences School of the University of Brasília (UnB), meeting the requirements of Resolution Nº 466 of 2012 of the National Health Council, 392,889. The sample was given for convenience, with patients hospitalized at the unit, who agreed to participate in the study voluntarily and signed a free informed consent form (TCLE).

According to the levels of care complexity (NCA), the patient classification instrument was used to classify the patients, based on the model proposed by Fugulin, according to ANNEX 3. Patient interview and observation were used to complete the instrument. Data collection occurred in the period from May to August 2014, 4 months. The analysis of the data obtained by the instrument was performed by the sum of the scores and the classification of the type of care. The patients classified with the need for high dependency care were added to intermediate care patients to allocate the amount of hours demanded per level of care in the 24 hours, following the COFEN Resolution nº 293/2004, which considers four levels of care (it does not contemplate the high dependency care).

After the classification of patients due to the need for care or level of care complexity (NCA), the number of nursing staff (QP) was calculated, which considers the total number of nursing hours (THE) in addition to the patients' classification score the number of days of the week (DS), the weekly working day (JST), the bed occupancy rate (TO) and the technical security index (IST), which is defined by the knowledge of the Absenteeism (TA) and the benefit rate (TB).

After obtaining these indices, the percentage distribution of nursing professionals was performed by category and level of assistance complexity of the unit, following the minimum and maximum parameters of COFEN Resolution nº 293/2004.6

RESULTS

In the 4-month period, there were 329 patients interviewed from all medical clinic beds, 141 women, and 188 men. The age ranged from 15 to 94 years old, and the mean age was 54 years old. These patients were hospitalized for 16 specialties attended at the clinic, and the specialty of emergency medicine covers the remaining 15 and characterizes that the patient admitted to the medical clinic had the emergency of the HUB as a gateway. The percentage distribution of hospitalizations by specialty, in the period of the research, are described in the table below.

Table 1. Distribution of hospitalizations in the Medical Clinic by specialty. **Brasília (DF), Brasil, 2014.**

Specialty	Hospitalized people in the period	%
Cardiology	33	10.03 %
General surgery	3	0.91 %
Dermatology	11	3.34 %
Endocrinology	6	1.82 %
Gastrology	19	5.78 %
Geriatrics	8	2.43 %
Gynecology	3	0.91 %
Hematology	1	0.31 %
Infectology	4	1.22 %
Emergency Medicine	140	42.55 %
nephrology	15	4.56 %
Neurology	3	0.91 %
Oncology	43	13.07 %
Pneumology	36	10.94 %
Rheumatology	3	0.91 %
Urology	1	0.31 %
Total	329	100 %

The distribution of patients by level of care complexity (NCAs): Minimum Care Patient (PCM); Intermediate Care Patient (PCI); High Dependency Care Patient (PCAD); Intensive Care Patient (ICSI) and Intensive Care Patient (PCIt), in the medical clinic unit, was assessed from May to August 2014 and showed a higher prevalence of PCM in the 4 months.

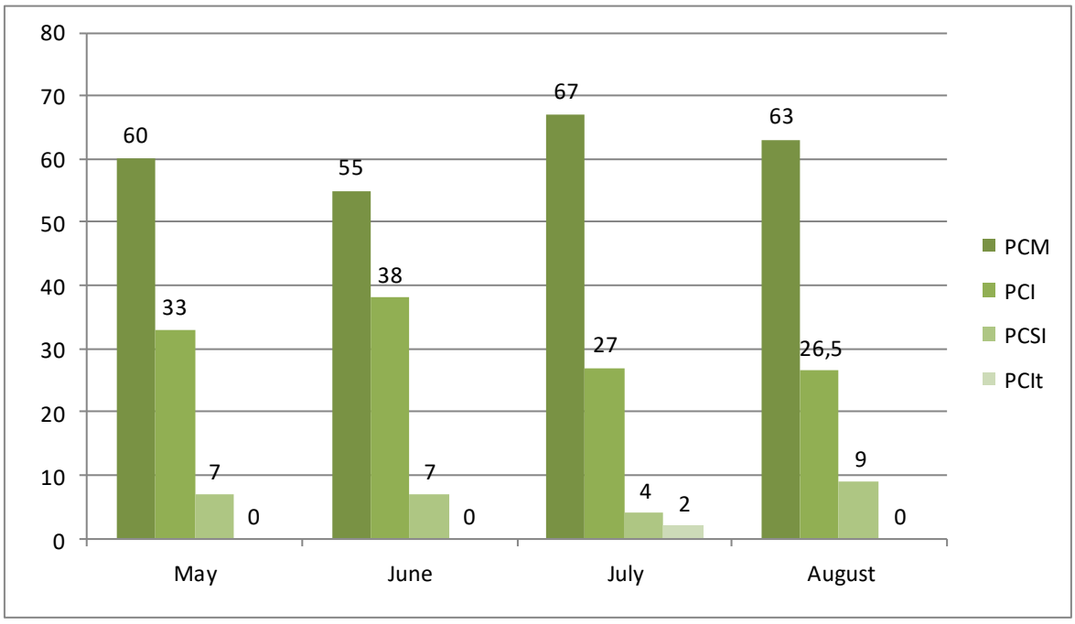

Figure1. Percentage of each NCA in the research months. Brasília (DF), Brazil, 2014.

To match the criteria determined by Resolution 293/2004, relating the number of hours of nursing required in 24 hours for each patient of a level of care, the high dependency classification was added to the number of patients classified in intermediate care, The NAC called PCAD is not mentioned, and it was understood that they are similar care categories in the dependency level of the caregiver team.

The NCAs calculated in the period were multiplied by the occupancy rates of the beds of said month, being 71.25% in the month of May; 71.11% in June; 75.14% in July; And 75.43% in August, an average of 73.23%.

For the calculation of total hours of nursing (THE), it was considered the monthly average of the daily amount of patients with levels of PCM; PCI, PCSI and PCIt care complexity, multiplied by the occupancy rate of the corresponding month´s beds. The product of each NCA with the TO rate was multiplied by the number of nursing hours that each level demands, as recommended by the COFEN Resolution.

In calculating the IST, the planned and unplanned absences of 6, 8 and 12 hours of each shift were considered. Due to the existence of employees with different weekly employment and workload (JST) in this sector, STIs were calculated for each group, and a weighted average was calculated to consider the number of employees in each group. The results obtained were 12.94% in May, 6% in June, 10.32% in July and 7.2% in August.

Because it is a teaching hospital, it should be considered the time spent with activities not directly associated with care, since

teachers, students and physicians often ask nursing professionals for questioning or to perform procedures not foreseen in the routine. Therefore, in addition to the IST calculated for absences, safety values were added to cover these needs, which comprise aspects inherent in the quality of care. These added values correspond to: 3 to 5% of the nursing staff for continuing education, established in Article 8 of Resolution COFEN 293/04, which was used 3%; 15.38% for personnel adaptation - obtained by the calculation 18x100 ÷ 117, where 18 is the number of new employees and 117 the number of employees of the sector in the month of November, when the analysis occurred, to consider the newly admitted employees by tender and which are in the period of integration; 2.77% for teaching, obtained by 10x100 ÷ 360, considering that each employee spends almost 10 minutes with attendance to students, teachers, doctors and other professionals who demand time-related to teaching the 360 minutes (6 hours) that work in the day; and 2.77% for implementation of Nursing Care Systematization (SAE), considering that its execution would require on average 10 minutes of the 360 that work on day.[9]

With this, the IST used for the QP formula was: in May 36.86%; in June 29.92%, in July 34.24%, and in August 31.12%.

The number of nursing staff, QP, was obtained by calculating $QP = THE \times \frac{DS \times (1+IST)}{JST}$, where THE is the total nursing hours, DS is the number of days in the week that the service works (7 in hospitalization units), IST is the index of Technical Safety and JST is the weekly working day (36h). The result is shown in Table 2.

Table 2. THE and QP calculated in the period of research. Brasília (DF), Brazil, 2014.

	THE					QP
	PCM	PCI	PCSI	PCIt	Total	
May	110.2	89.6	28.2	-	199.8	53
June	98.9	98	32.9	-	229.8	58
July	129.2	78.4	18.8	17.9	244.3	64
August	121.6	75.6	42.3	17.9	257.4	66
Average in the period	114.975	85.4	30.55	8.95	232.825	60

For the distribution of PPAs in professional categories, the proportion of the PPAs was established based on the NCA prevailing in the survey conducted, as recommended by the COFEN Resolution.

Table 3. Distribution of QP by category of nursing employee, according to percentages recommended in Resolution COFEN 293/2004. Brasília (DF), Brazil, 2014.

	Total QP	Distribution per category			
		Recommended Percentage by the Nurse (%)	NE High Level (Nurse)	Recommended Percentage by the Nursing Technician (%)	NE Medium Level (Nursing Technician)
May	53	33	17	67	36
June	58	33	19	67	39
July	64	33	21	67	43
August	66	33	22	67	44
Average per period	60	33	20	67	40

Figure 2 shows the nursing QP calculated as necessary in the medical clinic unit of the hospital, by professional category, according to the study carried out.

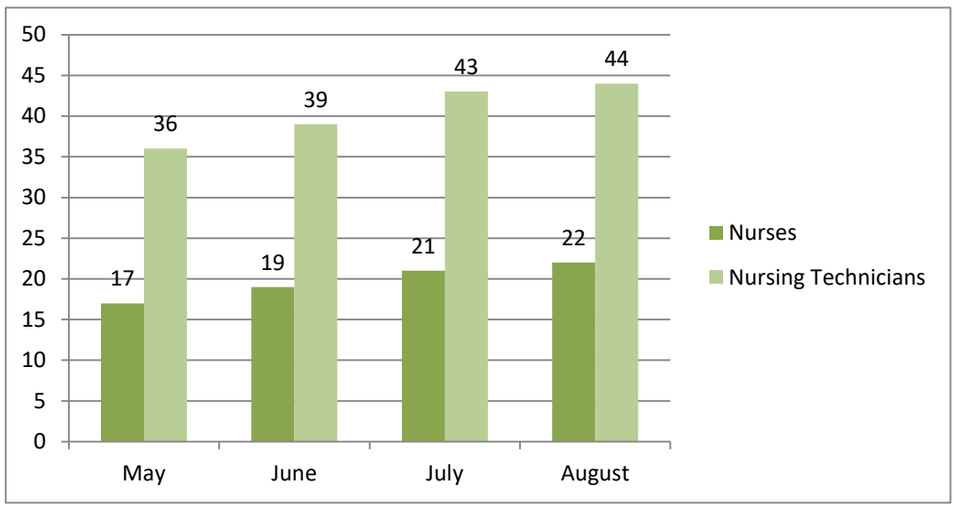

Figure 2. Nursing QP calculated in the period, by category. Brasília (DF), Brazil, 2014.

DISCUSSION

This study covering the Medical Clinic of the HUB enables to characterize the unit and generated important data from the managerial point of view, since it allows to recognize the profile of the people assisted, to know the patterns of time worked by employees and, consequently, to facilitate planning and adaptation of care routines that systematize the work of the team and improve the quality of care.

The data collection of the research lasted 4 months, and 329 patients were interviewed to identify their care needs, observing a rotation of the beds surveyed, with an average of 13 beds surveyed per day. With this, all the beds were visited, on average every 5 days, enabling to collect data representative of the total unit.

Patients classified as PCM prevailed, which reduces the hours dedicated by the nursing team to the hospitalized patient. Another factor that contributes to a lesser need of time spent by the employee is the availability of the sector regarding the presence of caregivers. Thus, throughout the study period elderly and chronic cancer patients always had the presence of an accompanying person, a fact that justifies not inserting more hours for these cases.

The data obtained on the hospitalizations of the patients surveyed showed Emergency Medicine as the most incident specialty of hospitalizations, with 42.55% of the total sample.

We may consider that some data directly impacting the calculation of IST (special license, medical licenses, absences and days off) did not have an effective control in the unit. Indirect care activities were considered to meet the qualitative questions of the nursing staff dimensioning that jeopardize the nurses' time.

During the study, the hospital underwent an intense period of transition, with the entry of mid-level and higher-level nursing staff, due to the calls for public tender for staff since the entry of the EBSERH company into the management of the HUB and with the exit of employees of these categories, who were contractually bound by contract. When employees are summoned, they are all assigned to the Medical Clinic or the hospital emergency room, and then reassigned as vacancies and employee interest arise in other sectors.

It is also important to point out that the calculation performed to determine the QP is appropriate to indicate the time spent on the direct care, that is, the time necessary to the procedures with the patients. Assistance planning activities, which include the nursing process and nursing orientations, as well as bureaucratic activities and tasks that require daily resolution, such as the work of management, clinical reasoning and planning to work with SAE, the participation of meetings, continuing education, and conflict resolution, among others, are not contemplated.[3]

We can also point out that, since the institution is the place for this study as a teaching hospital, it should be considered a greater number of employees who make up the team, since, in addition to receiving patients from different specialties, sometimes with rare pathologies, doctors, teachers, residents, students and other professionals, interfere with the daily routine, as employees often interrupt their activities to attend to these professionals or to perform procedures that were not foreseen in their routine.[9]

It should also be considered that some nursing technicians are assigned for referrals

of patients and samples to sectors of examinations, including for external areas.

Having discussed all these factors, it is evident that the nursing staff dimensioning is a complex subject. Despite being attributed a mathematical calculation, it is essential that the responsible manager is clear all the factors that determine the need for personnel, considering the mission of the institution, which in the case of EBSERH is desired excellence, so that adequate adjustments can be made to this goal.[3,6]

CONCLUSION

The research reached its general objective since it was possible to collect the necessary data for the dimensioning of the nursing team in the HUB medical clinic hospitalization unit, with understanding and collaboration of both the patients who accepted to participate in the study and the employees, who were always willing to provide the requested information.

However, there were institutional difficulties for the collection of data on absenteeism, which generated some damage to the result obtained.

In this unit, there is no management and only two nurses, on average, performing managerial functions of the sector, and they called them as routine. The other nurses work directly in the care and do not use the Systematization of Nursing Assistance (SAE). However, the HUB as a whole, undergoes a transition in its management and the staff, since from May until the closure of the research are being called approved professionals in competition, and improvements of all orders are expected. Therefore, the number of nurses already existing in the sector may be adequate, aiming to provide a more qualified nursing assistance, based on studies, improvement and following the SAE.

We believe that this research can contribute to new investigations that consider even more in depth questions about direct and indirect assistance, that contribute to the quality of the assistance and allow to improve the distribution of the working time of the nurses and the nursing technicians.

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