CARE COMPLEXITY IN THE INTENSIVE CARE UNIT: SUBSIDIES FOR NURSING STAFF DIMENSIONING

Caroline Pias[1], Nicole de Paula Mascolo[2], Eneida Rejane Rabelo-Silva[3], Graciele Fernanda da Costa Linch[4], Emiliane Nogueira de Souza[5]

[1]Registered Nurse. Specialist in Cardiology Nursing. Santa Casa de Misericórdia of Porto Alegre. Porto Alegre, RS, Brazil.
[2]Registered Nurse. Specialist in Cardiology Nursing. Cardiology Institute - Fundação Universitária (IC-FUC) of Porto Alegre. Porto Alegre, RS, Brazil.
[3]Registered Nurse. Specialist in Cardiovascular Nursing. PhD in Biological Sciences: Physiology. Professor of the Medical-Surgical Nursing Department of the Federal University of Rio Grande do Sul. Porto Alegre, RS, Brazil.
[4]Registered Nurse. PhD in Nursing. Professor of the Department of Nursing at the Federal University of Health Sciences of Porto Alegre. Porto Alegre, RS, Brazil.
[5]Registered Nurse. PhD in Cardiovascular Sciences. Professor of the Department of Nursing at the Federal University of Health Sciences of Porto Alegre. Porto Alegre, RS, Brazil.

ABSTRACT: Study developed aiming to classify patients of a Cardiac Intensive Care Unit, and to dimension the nursing staff. Prospective cohort study carried out between January and March 2011. The Care Complexity Grading Scale proposed by Fugulin was used. This scale classifies patients as: minimal, intermediate, high dependency, semi-intensive, and intensive care. All patients hospitalized during the study period were included. In total, 117 patients were evaluated, predominantly male (65%), coming from the emergency department, with a mean age 66±12 years. The patients were mostly classified as high dependency and intensive care. There is no correlation between the current dimensioning of the nursing staff and what is recommended by the Federal Nursing Council.
DESCRIPTORS: Intensive Care Units; Nursing care; Dimensioning; Nursing.

COMPLEXIDADE DA ASSISTÊNCIA EM UNIDADE DE TERAPIA INTENSIVA: SUBSÍDIOS PARA DIMENSIONAMENTO DE PESSOAL DE ENFERMAGEM

RESUMO: Estudo desenvolvido com objetivo de classificar os pacientes de uma Unidade de Tratamento Intensivo Cardiológica, e dimensionar o pessoal de enfermagem. Estudo de coorte prospectivo realizado entre janeiro e março de 2011. Utilizou-se a Escala de Gradação da Complexidade Assistencial proposta por Fugulin. Essa escala classifica os pacientes em: assistência mínima, intermediária, alta dependência, semi-intensiva, intensiva. Todos os pacientes internados durante a realização do estudo foram incluídos. Foram avaliados 117 pacientes, predominantes do sexo masculino (65%), com idade média de 66±12 anos, procedentes da emergência. Os pacientes foram classificados majoritariamente com cuidados de alta dependência e intensivo. Não há concordância entre o atual dimensionamento da equipe de enfermagem com o que está recomendado pelo Conselho Federal de Enfermagem.
DESCRITORES: Unidades de terapia untensiva; Cuidados de enfermagem; Dimensionamento; Enfermagem.

COMPLEJIDAD DE LA ASISTENCIA EN UNIDAD DE TERAPIA INTENSIVA: SUBSIDIOS PARA DIMENSIÓN DE PERSONAL DE ENFERMERÍA

RESUMEN: Estudio desarrollado con objetivo de clasificar los pacientes de una Unidad de Tratamiento Intensivo Cardiológica, y dimensionar el personal de enfermería. Estudio prospectivo realizado entre enero y marzo de 2011. Fue utilizada la Escala de Gradación de la Complejidad Asistencial propuesta por Fugulin. Esa escala clasifica los pacientes en: asistencia mínima, intermediaria, alta dependencia, semintensiva, intensiva. Todos los pacientes internados durante la realización del estudio fueron incluidos. Fueron evaluados 117 pacientes, predominantes del sexo masculino (65%), con edad media de 66±12 años, procedentes de la emergencia. La mayor parte de los pacientes fueron clasificados como de cuidados de alta dependencia e intensivo. No hay concordancia entre la actual dimensión del equipo de enfermería con lo que recomienda el Consejo Federal de Enfermería.
DESCRIPTORES: Unidades de Terapia Intensiva; Cuidados de Enfermería; Dimensión; Enfermería.

Corresponding author:
Emiliane Nogueira de Souza
Universidade Federal de Ciências da Saúde de Porto Alegre
R. Sarmento Leite, 245 - 90050-170 - Porto Alegre, RS, Brasil
E-mail: emilianes@ufcspa.edu.br

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INTRODUCTION

In terms of human resource management, it is known that both the qualification and the number of nursing professionals in a hospital are associated with the care results. Thus, the dimensioning of nursing personnel, considered an instrument for the management of quality, should be properly evaluated. In this context, there are patient classification systems (PCS), which are based on different factors and dimensions of the nursing practice, to categorize patients according to their care complexity.

The ideal PCS is one that employs instruments that provide reliable results for the evaluation of the patients and the unit, allowing the identification of the severity of the patients, the evaluation of the nursing workload, the quantification of the care needs of the patient and the estimation of the real need for nursing professionals per patient[1]. Therefore, the use of a PCS assists the nursing management practice and provides subsidies for the decision-making process with regard to allocation of personnel, monitoring of productivity and nursing care costs, organization of the services and planning of the nursing service[2-3].

Among the PCS available in the literature, one that best covers the characteristics of the clientele is the Care Complexity Grading Scale[4]. The author of the scale and other researchers developed a study in six intensive care units (ICU) of São Paulo aiming to evaluate the parameters recommended by the Federal Nursing Council (COFEN) Resolution No. 293/2004, as a reference for the dimensioning of nursing staff in the ICU[5].

In recent years, care standards in the ICU have evolved and intensive monitoring has become much more complex and specialized, as a result of advanced technology and standardizations by the regulatory councils. The COFEN ensures a determined number of patients per nursing professional in the ICU[2,6]. From this scenario, scientific investigations into the use of the PCS have been developed in general ICUs. Little is known about the classification of patients in the cardiology ICU, which is characterized by patients with predominantly clinical profiles.

Therefore, the aim of this study was to classify patients in a cardiology ICU, and to dimension the nursing staff.

METHOD

This prospective cohort study was carried out between January and March 2011 in a cardiology ICU, with 15 beds, of a specialist cardiology hospital located in southern Brazil.

The study population consisted of patients aged ≥ 18 years, of both genders, monitored in the afternoon shift for 30 days, who were hospitalized in the ICU during the study period. The sample was non probabilistic, defined over 30 days, excluding weekends, due to the scale of nurses being different compared to weekdays. Patients who did not agree to participate in the study were excluded.

For the data collection, an active search was conducted through the daily conference of patients hospitalized in the unit. For this, the list of patients, called the Hospital Census, and the patient notebook of the afternoon shift nurse were used as the resources. After this conference was held, the collection of data was performed from the individual folders for each patient and at the bedside, for the analysis of the general status of the patient at that time.

The Care Complexity Grading Scale proposed by Fugulin, previously validated in Brazil[4], and a questionnaire covering sociodemographic data to characterize the evaluated patients were used. Numerical and qualitative data of the nursing team were also collected.

The Care Complexity Grading Scale proposed by Fugulin is divided into nine categories: Mental state, Oxygenation, Vital Signs, Motility, Ambulation, Feeding, Body Care, Eliminations and Therapeutics. Each is formed of specific items that receive different scores and when summed the scores indicate the severity of the patient, with a minimum care score ranging from 9 to 14 points; intermediate care; from 15 to 20 points; high dependency care; from 21 to 26 points; semi-intensive care; from 27 to 31 points; and intensive care; more than 31 points.

The recommendation of the COFEN Resolution No. 293/2004 were used for the calculation of the dimensioning of the nursing staff[2]. The calculation had the following components: Number of personal (NP), considering the number of nurses required in the unit, based on the patient classification system and the occupancy rate; Total nursing hours (TNH), which is the sum of the hours required to cover the patient requirements for minimal care (PMC), intermediate care (PIC),

high dependence (PHDC), semi-intensive (PSIC), intensive (PITC); and the Marinho constant (KM) which is the coefficient deduced from the days of the week (DW) and from the weekly working hours (WWH).

The working week of 36 hours in the care unit and the technical safety index (TSI) are composed of two fundamental dimensions, the absence rate due to benefits (planned for vacation coverage, days off, etc.) and the rate of absenteeism (unplanned, i.e. absences/sickness). Using the TSI coefficient equal to 1.15 (15%) and substituting the WWH with the assumed value of 36 h, the KM will have the respective value(36) of 0.2236 (KM= DW/WWH x TSI). Thus, using the formula TNH= [(PMC x 3.8) + (PIC x 5.6) + (6.0 x PHDC) + (PSIC x 9.4) + (17.9 x PITC)], and then substituting the KM and TNH in the equation [NP= KM x TNH] the number of nursing staff was obtained[2].

For the dimensioning variable of the nursing staff, the mean hours of nursing care advocated by the COFEN Resolution No.293/2004[2] was used with an estimated six hours added for the patients requiring high dependency care[2], since this resolution does not address this type of care.

The data were entered into a spreadsheet using the Excel for Windows program. Analyses were performed using the Statistical Package for Social Sciences (SPSS) 19.0. The categorical variables were expressed as percentage (%) or absolute value (n) and the continuous variables as mean ± standard deviation or median and 25th and 75th percentiles, depending on whether they present normal distribution or not.

All the patients read and signed the informed consent form. The study was approved by the Research Ethics Committee of the institution under authorization number 4521/10.

RESULTS

A total of 117 patients were included in this study, 76 (65%) being male, mean age 66.30 ± 12.39 years, with 87 (74.4%) coming from the emergency department. The reason for the transfer was acute ST-segment elevation myocardial infarction (STEMI) for 48 patients (41%), followed by AMI without ST-segment elevation for 14 patients (12%). Among the verified comorbidities, 79 patients (67.5%) presented hypertension. The medications most commonly used during the ICU stay were antiplatelet agents, 91 patients (77.8%). Other additional information is shown in Table 1.

Table 1 - Clinical characteristics of the patients (n=117). Porto Alegre, RS, Brazil, 2011

Characteristics	n (%)
Male	76 (65)
Age (years)*	66.30 ± 12.39
Origin (Emergency department)	87 (74.4)
Reason for hospitalization	
Acute ST-segment elevation myocardial infarction	48 (41)
Acute myocardial infarction without ST-segment elevation	14 (12)
Arrhythmia	13 (11.1)
Comorbidities	
Systemic Arterial Hypertension	79 (67.5)
Smoking	47 (40.2)
Previous myocardial revascularization	25 (21.4)
Medications	
Antiplatelet agents	91 (77.8)
Anticoagulants	90 (76.9)
Lipid-lowering agents	76 (65)

*Continuous variable expressed as mean ± standard deviation.

The mean daily occupancy of the ICU was 12.57 ± 1.40 patients, 83.8% of the ICU total capacity. The mean score of the care complexity gradation scale proposed by Fugulin, for the total patients evaluated, was 24.74 ± 4.82, which equates to high dependency care. The data relating to the complexity of the patients and dimensioning of the members of the nursing staff are shown in Table 2.

Table 2 - Classification of the patients hospitalized in the ICU. Porto Alegre, RS, Brazil, 2011

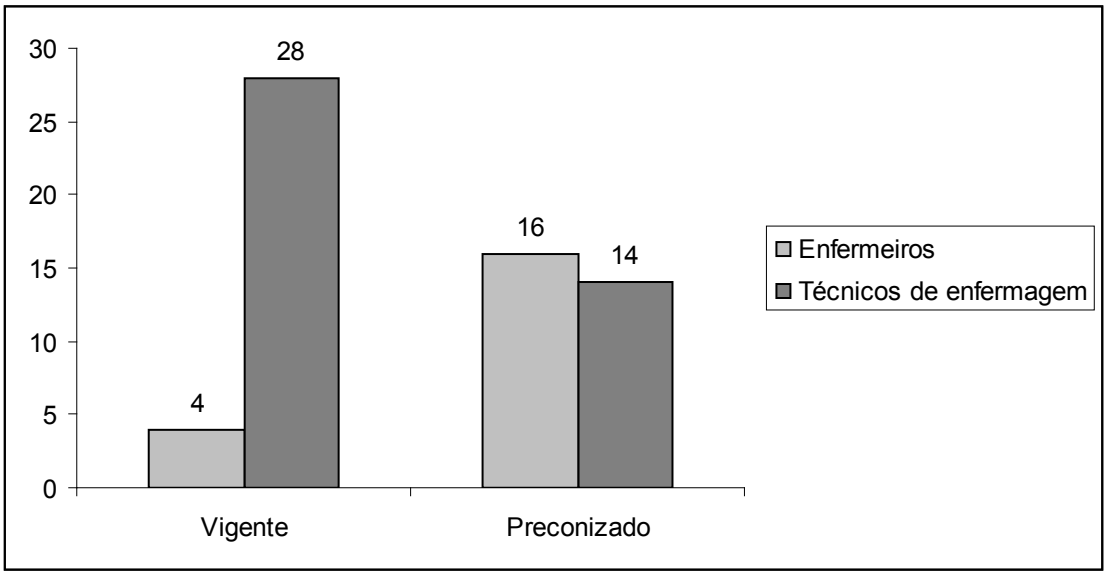
Variables	m ± SD
Occupancy rate (patients /day)	12.57 ± 1.40
Fugulin scale	24.74 ± 4.82
Complexity of the patients (care)	
Intensive	4.47 ± 1.65
Semi-intensive*	1.00 (0.00 – 3.00)
High dependence	5.27 ± 1.57
Intermediate*	1.00 (0.75 – 2.00)
Minimal	--
Employees (shift)	
Nurses	1
Nursing technicians	6.80 ± 0.71

*Variables expressed as median (25-75th percentiles).

The previously mentioned formulas were used to calculate the dimensioning of the workers, as recommended by COFEN, for 36 weekly working hours, providing the number of nursing personnel (NP) of 29.73 to 30 professionals.

Because the COFEN legislation does not predict the percentage of personnel according to the high dependency care category, most prevalent in the study, the complexity of intensive care was chosen as the reference, this being the second most prevalent category. Next the calculation of number of personal was performed, as previously described. The number of members of the ICU nursing staff that would be adequate was obtained as a result, this being a total of 16 nurses and 14 nursing technicians, according to the COFEN recommendations. The data is shown in Figure 1.

Thus, the results highlight that the actual number of nurses was less than that recommended and the number of nursing technicians was twice what would be recommended by the dimensioning calculations, according to COFEN.



Vigente = Actual; Preconizado = Recommended; Enfermeiros = Nurses; Técnicos de enfermagem = Nursing technicians

Figure 1 – Dimensioning of the nursing staff in the cardiology ICU. Porto Alegre, 2011

DISCUSSION

The majority of the patients required high dependency care due to their clinical characteristics, however, the exact number of professionals recommended could not be found due to the absence of a high dependency classification in the dimensioning calculation. Therefore, the calculation for intensive care, the second most frequent category, was used.

Regarding the clinical characteristics, there was a predominance of male and elderly patients, data that is in agreement with the literature[7-9], in which the age of patients with MI is related to the increase of atherosclerotic plaques that accumulate over of years[10]. The majority of the patients hospitalized in the cardiology ICU came from the emergency department of the institution with a diagnosis of AMI, for which there are several effective therapies, according to clinical guidelines[11-12], including interventional strategies associated with medication.

In this context, the medications most used during the hospitalization period in the intensive care sector were antiplatelet agents, anticoagulants and lipid-lowering agents, respectively. This may explain the prevalence of the high dependency care category, as patients who suffer an AMI may seem stable, however, have the potential for hemodynamic destabilization and should be continuously monitored, which requires systematic nursing care with absolute restriction to the bed, which is related to the concept of high dependency care. The absolute bed rest must be monitored, due to the vulnerability of the heart muscle with ischemia, the potential risk of decreased cardiac output, and complications such as bleeding due to anticoagulation therapy, arrhythmias, or even a poor recurrent coronary perfusion. It is known that in this scenario, nursing care is focused toward interventions designed to prevent or treat complications and promote the patient's return to daily activities.

Regarding the dimensioning of the nursing staff

in the sector studied, it was verified that this was not in agreement with what is recommended by COFEN. According to the COFEN Resolution No. 293/2004, the percentage distribution of nursing professionals must follow the proportions and the patient classification system. For intensive care 52-56% of nurses is recommended, for semi-intensive 42-46%, and for minimal and intermediate care 33-37% of nurses, with the remainder made up of technicians and auxiliary nurses. The distribution of professionals by category should follow the group of patients with the highest prevalence.

There were more mid-level professionals than upper level professionals, which is commonly the case in most Brazilian health institutions[13]. It is known that one of the most important requirements for quality healthcare coverage in hospitals is the correct dimensioning of nursing professionals, taking into account the epidemiological reality of the service. Therefore, it is illusory to think that the care does not generate profit for the hospital, because if improperly conducted, it can cause harm[14]. The actions and results of Nursing are often overshadowed in health services.

Intensive care is a specific area of attention in the health-disease process that is distinguished by high professional and technological training, in which professionals need to be highly qualified, whether regarding knowledge, skill and dexterity in performing procedures or in the management of unstable patients[14]. Nursing care can directly interfere, when not performed or improperly operationalized, in the clinical condition of the patient, in their length of hospitalization and in their intra-hospital evolution[15].

Currently, in Brazil we are experiencing an increase in opportunities for the discussion of safe practices in patient care, the meaning of which has impacted on the health sector economy. Thus, a study aiming to analyze the time used by the nursing staff to assist patients in an adult intensive care unit and to check its correlation with the healthcare quality indicators, found that the mean care time spent with the patients remained balanced, however, lower than indicated by the official Brazilian agencies. The results of this study demonstrate the influence of nursing care time, provided by nurses, on the results of the care provided[16].

Conversely, a study performed in inpatient units over a five-year period showed that the continuous evaluation of the dimensioning provided care quality. The researchers observed a balance in the mean care time. With this, the study demonstrated that continuous evaluation of the nursing staff condition of the inpatient units of a general hospital can allow the maintenance of the mean care time and hence the care quality[17].

Given the above, adequate dimensioning of the nursing staff in the cardiology ICU is reflected in the quality of the care provided, avoiding overloading certain professionals and even occupational injuries, leading to absences or sick leave. Among the benefits of increased numbers of nurses in the sector some quality indicators focused on the patient stand out: hospital infection rate, skin integrity maintenance, and patient satisfaction with the nursing care, pain management and health education received[15].

It is also important to mention that there are various barriers that hinder the use of research results to guide the professional practice and interfere in the comparison of results obtained with the references. It is known that evidence-based care protocols constitute instruments to qualify nursing practices, contributing to the evaluation of the quality of nursing care.

Data from the periodic evaluation of the staff dimensioning, combined with standardization by the professional councils, provide subsidies for the managers of the nursing services to request the provision of human and material resources from the administrative managers of the institutions, for better provision of quality patient care.

CONCLUSIONS

The complexity of the patients hospitalized in a cardiac intensive care unit is characterized, mainly, by patients in the high dependency and intensive care categories. Regarding the dimensioning of the nursing staff, there was no agreement between the actual organization and what was projected in this study, demonstrating a deficit of nurses.

Due to being an ICU, it was observed that the PCS applied in this study has limited use for this sector, as it does not include many activities and procedures carried out, and does not identify the different levels of severity of the patients. Accordingly, it is recommended to extend the results of this study, conducting further research using the TISS system (Therapeutic Intervention Scoring System) as a instrument option that takes into consideration that the more severe the condition of the patient, the higher number

of interventions and consequently the greater length of time spent by nurses on their care. Evaluation of nursing staff dimensioning allows it to be used as a management strategy to ensure care quality.

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