

## Classification of patients and nursing staff's sizing: contributions of a management technology



*Classificação de pacientes e dimensionamento de profissionais de enfermagem: contribuições de uma tecnologia de gestão*

*Clasificación de pacientes y dimensionamiento de profesionales de enfermería: contribuciones para una tecnología de gestión*

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### How to cite this article:

Vandresen L, Pires DEP, Lorenzetti J, Andrade SR. Classification of patients and nursing staff's sizing: contributions of a management technology. Rev Gaúcha Enferm. 2018;39:e2017-0107. doi: <https://doi.org/10.1590/1983-1447.2018.2017-0107>.

### ABSTRACT

**Objective:** Applying PRAXIS<sup>®</sup> technology resources for patient classification and nursing professional sizing in university hospital inpatient unit.

**Method:** Convergent Care Research following the design and instrumentation phases - defined the research theme and purpose, performed in a medical clinic hospital unit involving 633 participants; scrutiny - classification of patients during 30 days of June 2016, followed by sizing, analysis and interpretation of the results - elaborated with the support of the management theorization in hospital nursing.

**Results:** Amongst the total of 633 classifications made, 29.38% were patients in minimal care, 35.71% were intermediate care patients, 33.02% were highly dependent, 1.42% were semi-intensive and 0.47% were in intensive care. Two references were used to carry out the sizing; in both the available team showed to be in deficit.

**Conclusion:** The classification of patients and the sizing of nursing professionals are directly related, they are indispensable for management in nursing and difficult to perform daily. Computerized technologies are useful for performing these activities.

**Keywords:** Hospital administration. Personnel management. Quality of health care. Nursing.

### RESUMO

**Objetivo:** Aplicar recursos da tecnologia PRAXIS<sup>®</sup> para classificação de pacientes e dimensionamento de profissionais de enfermagem em unidade de internação de hospital universitário.

**Método:** Pesquisa Convergente Assistencial seguindo as fases de concepção e instrumentação - definidos tema e objetivo da pesquisa, realização em uma unidade hospitalar de clínica médica envolvendo 633 participantes; perscrutação - classificação dos pacientes durante 30 dias de junho de 2016, seguido de dimensionamento; análise e interpretação dos resultados - elaborada com suporte da teorização de gestão em enfermagem hospitalar.

**Resultados:** Realizadas 633 classificações e encontrados 29,38% pacientes em cuidados mínimos, 35,71% cuidados intermediários, 33,02% alta dependência, 1,42% semi-intensivos e 0,47% cuidados intensivos. Para realização do dimensionamento utilizou-se duas referências; em ambas a equipe disponibilizada mostrou-se deficitária.

**Conclusão:** Classificação de pacientes e dimensionamento de profissionais de enfermagem estão diretamente relacionados, são indispensáveis para gestão em enfermagem e de difícil realização cotidiana. Tecnologias informatizadas são úteis para realização destas atividades.

**Palavras-chave:** Administração hospitalar. Administração de recursos humanos. Qualidade da assistência à saúde. Enfermagem.

### RESUMEN

**Objetivo:** aplicar recursos de la tecnología PRAXIS<sup>®</sup> para la clasificación y dimensionamiento de profesionales de enfermería en una unidad de internación de un hospital universitario.

**Método:** investigación convergente asistencial, siguiendo las etapas de concepción e instrumentación - definidos el tema y objetivo de la investigación, realización en una unidad hospitalaria de clínica médica involucrando a 633 participantes; escrutación - clasificación de los pacientes durante 30 días de junio de 2016, seguida de dimensionamiento. Análisis e interpretación de los resultados elaborados con soporte de la teorización de gestión en enfermería hospitalaria.

**Resultados:** se realizaron 633 puntuaciones y se encontraron 29,38% pacientes en cuidados básicos, 35,71% en cuidados intermedios, 33,02% en alta dependencia, 1,42% en semi-intensivos, y 0,47% en cuidados intensivos. Para realizar el dimensionamiento, se utilizaron dos referencias. En ambos el equipo disponible se mostró deficiente.

**Conclusión:** la clasificación de pacientes y el dimensionamiento de los profesionales de enfermería están directamente vinculados, son indispensables para la gestión en enfermería y de difícil realización cotidiana. Las tecnologías informatizadas son útiles para realizar estas actividades.

**Palabras clave:** Administración hospitalaria. Administración de personal. Calidad de la atención de la salud. Enfermería.

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## INTRODUCTION

Nursing is a health profession that plays a fundamental role in the healthcare outcome, both in the hospital and out-of-hospital environments. It is a complex social practice, historically relevant to human life, and it has three basic dimensions that include practices in the area of caring for individuals, families and social groups; those of the scope of educating and researching; and administrative management<sup>(1)</sup>. The latter is directly related to the other two dimensions and comprises a significant part of the nurses' work, being responsible for the accomplishment/coordination of efficient and organized planning and execution of nursing activities. In order for the nursing work to be carried out with quality, it is necessary for nurses to have tools that assist in the management of the care spaces, as well as in the management of the teams and the care provided to the users of the service. In the case of the hospitals, the nurses' knowledge regarding management, as well as tools that contribute to their efficient and effective performance, contributes to the quality of the services provided to the population.

In the contemporary agenda of several countries there is a growing concern about the availability of health services that provide safe and quality care<sup>(2-3)</sup>. The quality and safety in health services are related to the workforce, involving several aspects, including their provision in quantity and quality.

International studies, such as the one carried out in 243 hospitals in 6 European countries<sup>(4)</sup> and another carried out in 60 hospitals in South Korea<sup>(5)</sup>, show that there is a direct correlation between adequate care staff in quantity and quality with the assistance results involving directly the patient's safety and the quality of the services offered.

Regarding the number of nursing professionals required for care, the expression "nursing staff sizing" is highlighted, understood as the initial stage of the process of providing professionals, in order to provide a forecast of the number of professionals by category of care needs to be fulfilled directly or indirectly to patients<sup>(6)</sup>.

The sizing is an indispensable resource for the provision of nursing staff in quantity and quality and also basis for the organization of the team needed to meet the needs of patients, respecting the degree of dependence they present. And the classification of the patient by degree of dependence constitutes the first step, subsidy for the calculation of the sizing. The realization of the daily and systematic classification not only allows an adequate organization of the assistance and the accomplishment of the sizing, but it also means a reorientation for the user-centered care, articulating improvements for the creation of favorable and positive practice environments<sup>(6-7)</sup>.

User-centered care, or as noted by the Health Foundation, "person-centered care" can be defined based on four principles: guarantee that people will be treated with dignity and respect; provision of care or support and coordinated treatment; personalized care and support for people; empowering people to live independently and fully<sup>(8)</sup>. In order for professionals to be able to make healthcare more user-centered, both health institutions and the professionals that work in them must adopt several initiatives and approaches capable of favoring and providing the best care to users.

The classification of the health situation of the users is a resource of the theoretical context of progressive care for the patient (PCP), developed from the 1950s in the USA and introduced in Brazil in the 1970s. This knowledge and practice guided a reorganization of the hospital care with the creation of appropriate units for each degree of care<sup>(9)</sup>. The most evident legacy of this process was the generalization of the intensive care units - ICU<sup>(10-11)</sup>. Currently, a renewal of this conception occurs with the implementation of semi-intensive and high-dependency units.

The classification of patients in nursing has been established as a relevant and indispensable instrument for the organization of care with a focus on the user and for the sizing of nursing professionals. If performed on a daily and systematic basis, the classification also reflects an estimate of the care needs for each patient<sup>(6-7)</sup>.

The Federal Nursing Council (Cofen) has established guidelines for the dimensioning of personnel using the patient classification. This guideline is present in the Resolution 189/1996, updated by the Resolution 293/2004, and currently replaced by 0527/2016, which changed the number of hours of the nursing care in the 24 hours, by category of care, as well as introduced the high dependency as one of the categories<sup>(12)</sup>. The macro challenge that is placed for nursing is the practice of daily classification of the care needs of the users and the consequent appropriate sizing of the professionals for safe and quality care. Complex and challenging scenarios, such as the practice environments where nursing works, constitute favorable environments for critical thinking and the use of innovative technologies, such as the tools to qualify and facilitate this work.

In Brazil, a technology for the management of hospital inpatient units, called PRAXIS<sup>®(7)</sup>, which is operating in a University Hospital, allows the use of a set of indispensable tools for the nurses' work, including the patient classification. The structural components of the PRAXIS<sup>®</sup> system include the Participatory Unit Planning (PPU), Management of the Care Processes (GPAS), the Nursing Team Management (GPEN), the Material Management (GMAT) and the Quality Assurance Management (GQUALI). In addition, the PRAXIS<sup>®</sup>

software incorporates a dashboard that provides real-time patient classification and other information relevant to the daily work in the inpatient unit. The GPAS module includes an instrument for the classification of patients. The classification instrument inserted in the software was the one elaborated by subject researchers<sup>(13)</sup> who applied it in units of Medical Clinic. The result of the classifications enables the calculation of the hours of nursing care required in the unit, the basis for the sizing of the necessary professionals<sup>(7)</sup>.

Given a broad consensus that adequate sizing and a consistent management are preconditions for positive practice environments, the following guiding question of the study was formulated: In what way can the managerial activities of nurses, patient classification and the sizing of nursing professionals be facilitated by the use of computerized technology? In this context, the objective of the study was to apply the PRAXIS® technology to perform the classification of patients and the subsequent sizing of professionals in a medical clinic inpatient unit.

## ■ METHOD

The study was conducted in the field of intervention research, and it was guided by the precepts of the Convergent Care Research (CCR)<sup>(14)</sup>, which is adequate for research and intervention purposes in the context of the nursing practice, based on the interaction of the researcher with a specific reality. It is a study of the scope of the managerial dimension of the professional practice of nurses, in which an intervention was performed in a hospital inpatient unit through the use of the PRAXIS management technology<sup>(7)</sup>.

The study followed the four phases of CCR: conception, instrumentation, examination and analysis.

At the conception stage, the subject was delimited, as well as the elaboration of the study objective. The physical space/location of the research and the research participants were defined in the instrumentation phase. This phase is described as the phase where the design of the methodological aspects occurs<sup>(14)</sup>. Considering the defined objective, the research was carried out in the hospitalization unit of a medical clinic of a university hospital in the Southern region of Brazil, where the PRAXIS® software is installed, with the nursing team using the patient classification tool<sup>(13)</sup>, available in the mentioned software.

In the examination phase, the data collection involved the classification of patients by degree of dependence of the nursing team and the calculation of the team size. It was initiated with an invitation, presentation of the objectives of the research and sensitization of the professionals and training to use the instrument of classification of the

patient and realization of the sizing of the nursing professionals. This invitation was made by the researcher to all the nurses of the three morning, afternoon and evening shifts, totaling 9 nursing assistants plus the head of the medical clinic unit that has 25 beds. The 10 nurses accepted the invitation and participated in the research that was carried out during three months, from April 1 to June 30, 2016. For the calculation of the sizing, the data of June 2016 were used, totaling 633 classifications. The profile of the patients admitted to this medical unit is mostly from patients with chronic diseases, including cardiology, rheumatology, pneumology, and endocrinology, plus 8 beds of hematology.

The classification of the patients was performed by 10 nurses allocated in the unit, after training by the researcher, and occurred after the visit/nursing round. Inpatients were classified at least once a day, in the category that best identifies their degree of dependence, being altered depending on their oscillation. After training to use the instrument of classification of patients<sup>(13)</sup>, they were classified in one of the categories that best identified their degree of dependence, being: minimal, intermediate, high dependency, semi intensive and intensive care. The total of classifications was 633. The dynamics of the patient classification is articulated with the accomplishment of the Nursing Assistance Systematization (NAS). After NAS, the nurse was invited to perform the classification of the patients. This flow is possible because the PRAXIS® system integrates with the hospital administration system.

Ideally, patients should be classified every 24 hours, and may even be reclassified within this period, if his/her the clinical situation changes significantly. For sizing purposes, it is important that all patients are classified for at least 30 days, and in a typical considered month<sup>(6)</sup>. The patient classification instrument used<sup>(13)</sup> has nine areas of care, including mental status, oxygenation, vital signs, motility, ambulation, feeding, body care, elimination and therapy. Figure 1 shows one of the PRAXIS® software screens<sup>(7)</sup>, with the areas of the patient classification instrument adopted<sup>(13)</sup>.

The categories of care adopted in PRAXIS® are described in a Brazilian study<sup>(6)</sup> including **Intensive Care (InC), Semi-Intensive Care (SIC), High Dependency (HD), Intermediate Care (IC), Minimal Care (MC)**. These categories are also endorsed in the resolutions of Cofen 293/2004 and 0527/2016<sup>(12)</sup>.

After the classification of the patient in the PRAXIS® system, the color that characterizes the degree of dependence of this patient is available for visualization of the team at dashboard. The patient is green if he is in minimal care, blue if he is in intermediate care, yellow if he is in high dependency and red if he is in semi-intensive or in intensive care.

**Management System of Hospitalization Units**  
Hospital: Hospital Universitário Polydoro Ernani de São Thiago  
Unit: Medical Clinic Unit 2

**Patient's Classification Tool**

Exit: 324    Bed: A    Chart: 459025    Patient: \_\_\_\_\_

CARE AREA	DEGREE OF THE CARE COMPLEXITY			
	4	3	2	1
<b>Mental State</b>	Unconsciousness <input type="checkbox"/>	Periods of unconsciousness <input type="checkbox"/>	Periods of disorientation in time and space <input type="checkbox"/>	Orientation in time and space <input type="checkbox"/>
<b>Oxygenation</b>	Mechanical ventilation (use of blower at pressure or volume) <input type="checkbox"/>	Continuous use of oxygen mask or catheter <input type="checkbox"/>	Intermittent use of mask or oxygen catheter <input type="checkbox"/>	Does not depend on oxygen <input type="checkbox"/>
<b>Vital signs</b>	Control in intervals lower than or equal to 2 hours <input type="checkbox"/>	Control in intervals of 4 hours <input type="checkbox"/>	Control in intervals of 6 hours <input type="checkbox"/>	Routine control <input type="checkbox"/>
<b>Motility</b>	Unable to move any body segment Changing of decubitus and passive movement programmed and performed by nursing <input type="checkbox"/>	Difficulty in moving body segments Changing of decubitus and passive movement aided by nursing <input type="checkbox"/>	Limitation of movement <input type="checkbox"/>	Moves all body segments <input type="checkbox"/>
<b>Ambulation</b>	Bed restricted <input type="checkbox"/>	Locomotion through a wheelchair <input type="checkbox"/>	Need help wandering around <input type="checkbox"/>	Ambulant <input type="checkbox"/>
<b>Feeding</b>	Through a central catheter <input type="checkbox"/>	Through a nasogastric tube <input type="checkbox"/>	By mouth with assistance <input type="checkbox"/>	Self-sufficient <input type="checkbox"/>
<b>Body Care</b>	Bathing in bed, oral hygiene performed by nursing <input type="checkbox"/>	Shower bath, oral hygiene performed by nursing <input type="checkbox"/>	Assistance in shower and/or oral hygiene <input type="checkbox"/>	Self-sufficient <input type="checkbox"/>
<b>Elimination</b>	Evacuation in the bed and use of a bladder catheter to control diuresis <input type="checkbox"/>	Use of bedwetting or bedding elimination <input type="checkbox"/>	Use of toilet with aid <input type="checkbox"/>	Self-sufficient <input type="checkbox"/>
<b>Therapy</b>	Use of vasoactive drugs, fess. maintenance of the A.P.E. <input type="checkbox"/>	E.V. continuous or through nasogastric tube <input type="checkbox"/>	Intermittent E.V. <input type="checkbox"/>	I.M or V.O <input type="checkbox"/>

Care Category 0

Source: Patient Classification Instrument of Fagulin et al (2002, 2005)

Praxis - Version 1.0    Login Time: 13:22    Time of Session: 30.0m    Welcome, Jorge ...

**Figure 1** - Patient Classification Instrument Screen

Source: Adapted image of the instrument used<sup>(7,13)</sup>

Finally, in the last phase of CCR, analysis<sup>(14)</sup>, the data were synthesized and theorized. In this phase, the conceptual framework of reference was used to analyze the data, articulating theories and concepts about management in health and nursing, and management of hospitalization units, as well as on the classification of the patient by degree of dependence of the team and calculation of nursing professionals' sizing. For the sizing, the parameters established in the Cofen Resolution 0527/2016<sup>(12)</sup> and those available in the publication of 2016 were used<sup>(6)</sup>.

Regarding the ethical aspects, all the recommendations of resolutions 466/2012 and 510/2016 of the National Health Council were respected. The participants signed the free and informed consent term and the data were collected after approval of the Ethics Committee on Research with Humans (CEPSH) of the Federal University of Santa Catarina under the No. 1.475.623.

## RESULTS

The Convergent Care Research (CCR), in all its phases, proved to be useful in the proposed intervention study, and guided the research process from its conception to the interpretation of results. The nurses working in the unit participated in the data collection and discussion about the data obtained, as well as the usefulness of the PRAXIS® technology resources, installed in the medical clinic unit where the study was performed.

Below are the results regarding the daily classification of patients and the sizing of nursing professionals, based on a normative and theoretical reference.

### Daily classification of patients by degree of dependence

In June 2016, all the patients in the unit were classified by the computerized PRAXIS® system, totaling 633 classifications per degree of dependency. The results showed that 186 (29.38%) patients had minimal care, 226 (35.71%) had intermediate care, 209 (33.02%) were highly dependent, 9 (1.42%) were semi-intensive care, and 3 (0.47%) in intensive care.

Other indicators of the unit in June were: the average number of patients per day 21.16 patients/day; average length of stay 12.12 days, and occupancy rate 86.4%.

The rankings by degree of dependency fluctuated during the 30 days of June. Initially, patients with minimal care were predominant, followed by those in intermediate care. During the month there was an increase of patients in high dependence, and until the end of the month the categories of intermediate care and high dependence predominated. The categories of semi-intensive and intensive care presented little oscillation during the month. It is worth mentioning that because it was a medical admission unit, it was expected that there would not be many patients classified in these categories. It was also evidenced a strong presence of patients in high dependency and an average stay of 12.12 days.

### Sizing of Nursing Professionals

Using the tool inserted in the PRAXIS® system, it was possible to evaluate the workload of the unit (nursing

hours required)<sup>(6)</sup> in June 2016 (considered a typical month for the said calculation), and thus carry out the estimated survey of the necessary team to attend the patients. What can be observed in Table 1.

**Table 1** - Unit workload. June 2016

Degree of care	AP*	HR**	THS***
Minimum	6.22	4	24.88
Intermediate	7.56	6	45.36
High dependence	6.99	10	69.9
Semi intensive	0.30	10	3
Intensive	0.09	18	1.62
<b>Total</b>	<b>21.16</b>		<b>144.76</b>

Source: Research data, 2016.  
 \* AP: Average number of patients (number of patients per care category).  
 \*\* HR: Hours required (total in nursing hours for each category of care).  
 \*\*\* THS: Total Hours of Nursing (total number of nursing hours required).

The study showed that the unit surveyed, in June 2016, had a daily average workload of 144 hours and 76 minutes. The oscillation of the number of hours of nursing required, daily, showed a direct correlation with the greater number of hospitalized patients.

The nursing workload, in June 2016, was identified using the instrument available in PRAXIS® technology,

and for the calculation of the nursing professionals required to attend the users of the unit, two criteria were used: that established in the Resolution 0527 of COFEN of 2016<sup>(12)</sup> and the guidelines of the authors used as reference<sup>(6)</sup>. Table 2 identifies the number of professionals available in the unit in June 2016 and the required team.

**Table 2** - Number of professionals required and made available based on the calculation of the nursing team's sizing in a hospitalization unit. June 2016

	Team required		Team made available
	Regulatory reference*	Theoretical reference**	
Professionals			
Nurses	14	17	9
Nursing Technicians	25	30	24
<b>Total</b>	<b>39</b>	<b>47</b>	<b>33</b>

Source: Research data, 2016.  
 \* The Cofen Resolution<sup>(12)</sup> was used, considering the proportion of nurses and technicians, by the group of patients with the highest workload in the unit.  
 \*\* The model was used for staff's sizing<sup>(6)</sup>, considering 85% of effective working time and 65% of technical safety index.

### DISCUSSION

The classification of patients by degree of dependence both provides tools for the sizing calculations of the nursing professionals, as well as stimulates the user-centered nursing practice. Sizing calculations are fundamental for the planning and organization of the care, and the use of computer resources and computer programs contribute to facilitate the accomplishment of this activity. Computer programs can provide "effective quali-quantitative informa-

tion for an adequate sizing of the professional staff, streamlining the decision-making process with cost, time and energy savings"<sup>(6)</sup>.

In the present study we used the instrument of classification of patients elaborated by said authors<sup>(13)</sup> and made available through the PRAXIS technology<sup>(7)</sup>. This technology is installed in an inpatient unit of a medical clinic, and it proved to be useful as a tool that favors a more qualified and focused nursing regarding the needs of the users. The results of the classification by degree of care dependence,

being 33.02% for high dependence and 35.71% for intermediate (corresponding to more than 2/3 of the patients) corroborate with previous studies performed in the same hospitalization unit<sup>(7)</sup> and also in other studies<sup>(13,15-16)</sup>. These studies highlight the increase of patients in high-dependency care in the hospitalization units and the increase in the degree of complexity/dependence, clinical instability and severity of the patients, which results in a greater workload of the nursing professionals<sup>(15-16)</sup>.

In Brazil, at the end of 2016, the Federal Nursing Council published the Resolution 0527/2016<sup>(12)</sup>, which updated the previous provisions, establishing parameters for the sizing of the nursing professionals in the services/places where the nursing activities are performed. The resolution presents positive aspects and questionable points that need to be revised. Among the positive ones, it should be highlighted the introduction of concepts and methodology for the calculation of the nursing staff for the care units, diagnostic and therapeutic support, surgical center, mental health area, special care units (SCU) and parameters for sizing the professionals in the Primary Health Care (PHC). Also on the innovative and positive aspects regarding concepts and methodology for the calculation of the nursing staff in hospitalization units, emphasis is placed on the inclusion of the category of high-dependency care; the update of hours of nursing care per patient in the 24 hours, and the percentage of the distribution of the total number of nursing professionals. This distribution considers that for minimal and intermediate care: 33% must be nurses (minimum of six) and the other nursing assistants and/or technicians; for high-dependency care: 36% must be nurses and the other nursing technicians and/or assistants; for semi-intensive care: 42% of nurses and the other nursing technicians; and for intensive care: 52% of nurses and the other nursing technicians<sup>(12)</sup>.

It remains as a perspective to be achieved the aspect related to the TSI (technical security index) that, as provided in articles 10, 13 and 14 of the Resolution 0527/2016<sup>(12)</sup>, it is considered the TSI of 15% of the total number of professionals, referring to holidays and unforeseen absences; 5% of the institution's nursing staff to cover situations related to staff turnover and participation in permanent education programs. And another 10% to the professional staff of nursing care units, composed of 50% or more of people over 50 years old or 20% or more of professionals with limitation/restriction to the exercise of their activities. That is, the TSI considered by the Resolution 0527/2016 is a maximum of 30%. A study<sup>(6)</sup> indicates a TSI of 65% for the 30-hour workweek, including 40% for weekly paid holidays, 3.6% for days off with holidays not coinciding with Sundays, 9% for 30 days of vacation, 3%

for absences and leaves, and 1.5% for training and development. This divergent aspect between the resolution and the literature indicates the need and the importance of further studies on the subject.

The results of this research show that, considering the two chosen references, theoretical<sup>(6)</sup> and the Cofen Resolution 0527/2016<sup>(12)</sup>, there is work overload and undersizing of the team in the unit studied. These factors of overload and undersize impair the quality of care and patient's safety.

A survey conducted in 60 hospitals by researchers<sup>(5)</sup>, in South Korea, verified a direct relationship between the inadequate sizing of the nursing professionals and the performance of overtime with the increase of adverse events. This study makes a direct correlation that the higher the number of patients per nurse, the greater the chances of failures related to patient's safety, the poor quality of care and care left behind due to lack of time. It is possible to find in the literature the record that there is a relationship between number and professional qualification with the quality and safety of the care performed<sup>(4,17)</sup>. The number of suitable professionals and the best educational level of the professional are a precondition for the performance of safe and quality care, and provide practice environments that are more favorable to users and professionals. There is a relationship between quantitative and professional education with the mortality rate and quality of care<sup>(17)</sup>. The study was conducted in 243 hospitals in 6 countries: Belgium, England, Finland, Ireland, Spain and Switzerland, and showed that a higher proportion of nurses in the team is associated with better patient outcomes. There is a positive combination between the higher proportion of qualified nurses with reduced mortality rates, better patient assessment of their care, and lower rate of adverse events. This study reports that the reduction of 10% in the proportion of professional nurses is associated with a 12% increase in the probability of death of the patients.

Nurses have an indispensable role in building positive and favorable practice environments, which implies, in addition to adequate quantitative and qualitative professionals, a coherent management that provides pleasant, safe environments with efficient and satisfied professionals<sup>(7)</sup>. The shift from practice environments, to more positive environments, includes organizational, structural, and care factors. And this change is related to the culture of the work environment, which involves the different factors mentioned above<sup>(18)</sup>.

The PRAXIS® software is a tool that is in line with the proposal to improve the practice environments, but the great challenge is to guarantee the use of these tools in a systematic and continuous way in the professional work of

the nurse. In this sense, the present article was the result of a master's thesis<sup>(19)</sup> which sought to demonstrate the utility of technologies of this type for the qualification of the nursing management in hospital settings. The importance of informatics in health and nursing practice is also mentioned in other studies<sup>(20)</sup> as necessary for the quality and safety of this professional work.

## ■ CONCLUSION

The classification of patients and the sizing of the nursing professionals are indispensable for the identification of the staff needed to attend the users in their degrees of dependence. The use of a management technology to perform the classification of patients contributed to the agility and safety in the sizing of nursing professionals. Both are directly related, indispensable for the nursing management and difficult to perform every day, however, the use of the PRAXIS® software resources has demonstrated that computerized technologies constitute a promising resource.

Studies such as this reinforce the importance of the everyday application of classification and sizing and emphasize that a great challenge for an adequate and safe care practice is the realization of these processes, in a systematic and continuous way by nursing. Technologies such as the PRAXIS® software contribute to the nursing management and to qualify the care practices in order to provide improved practice environments for users and professionals. In addition, the PRAXIS® technology is a resource for teaching and research in nursing. In the case of teaching, the software can also be used in the context of simulation practices and for research, the stored database allows the analysis of different management data in hospital admission units.

As a limitation of this study, it can be mentioned that although the PRAXIS® technology integrates several tools of the nurses' work, it is still not applied daily in all its resources by the nursing team; and to date it is only deployed in a pilot hospitalization unit. However, the version 2.0 is under development, which will enable its use in other types of units that integrate the hospital environment.

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Received: 06.08.2017

Approved: 10.06.2017