Nurses' time distribution: dentification and analysis in a medical-surgical unit*

DISTRIBUIÇÃO DO TEMPO DAS ENFERMEIRAS: IDENTIFICAÇÃO E ANÁLISE EM UNIDADE MÉDICO-CIRÚRGICA

DISTRIBUCIÓN DEL TIEMPO DE LAS ENFERMERAS: IDENTIFICACIÓN Y ANÁLISIS EN UNA UNIDAD MÉDICO QUIRÚRGICA

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ABSTRACT

This study was performed to identify and analyze the distribution of nurses' work hours at a medical-surgical hospitalization unit, in view of the impact on making the nursing personnel dimensioning process effective during their work hours. Of the activities that nurses performed, 50% of the nurses' time was invested on indirect care interventions, 22% on direct care interventions, 18% on personal time activities, and 10% on associated activities. These data confirm previous reports that show a need to consider nursing personnel's personal time and associated activities in the official rightsizing methods.

KEY WORDS
Nursing staff, hospital.
Time management.
Workload.
Classification.

RESUMO

Diante do impacto da distribuição do tempo de trabalho da profissional enfermeira na determinação de parâmetros para a operacionalização do processo de dimensionar pessoal de enfermagem, este estudo teve por objetivo identificar e analisar a distribuição do tempo de trabalho das enfermeiras em uma unidade de internação médico-cirúrgica. Para a consecução dos objetivos da pesquisa considerou-se, como população estatística, as atividades de enfermagem realizadas pelas enfermeiras durante os turnos de trabalho. Verificou-se que 50% do tempo destas profissionais foram dedicados às intervenções de cuidado indireto, 22% às intervenções de cuidado direto, 18% às atividades de tempo pessoal e 10% às atividades associadas. Estes dados corroboram a indicação de pesquisadores que apontam a necessidade de serem considerados o tempo pessoal dos trabalhadores de enfermagem e a realização das atividades associadas nos métodos de dimensionamento de pessoal preconizados pelos órgãos oficiais.

DESCRITORES
Recursos humanos de enfermagem no hospital.
Gerenciamento do tempo.
Carga de trabalho.
Classificação.

RESUMEN

Delante del impacto de la distribución del tiempo de trabajo de la profesional enfermera en la determinación de parámetros para la operacionalización del proceso de dimensionar el personal de enfermería, este estudio tuvo por objetivo identificar y analizar la distribución del tiempo de trabajo de las enfermeras en una unidad de internación médico quirúrgica. Para la consecución de los objetivos de la investigación se consideró, como población estadística, las actividades de enfermería realizadas por las enfermeras durante los turnos de trabajo. Se verificó que 50% del tiempo de estas profesionales fue dedicado a las intervenciones de cuidado indirecto, 22% a las intervenciones de cuidado directo, 18% a las actividades de tiempo personal y 10% a las actividades asociadas. Estos datos corroboran la indicación de investigadores que apuntan la necesidad de considerar el tiempo personal de los trabajadores de enfermería y la realización de las actividades asociadas en los métodos de dimensionamiento de personal preconizados por los órganos oficiales.

DESCRIPTORES
Personal de enfermería en hospital.
Administración del tiempo.
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INTRODUCTION

Health organizations, including hospitals, are constantly influenced by political and economic activities, technological progress and globalization that compel them to reach efficient results.

Within this context, health institution administrators have been investing in the search for new management strategies that facilitates costs reduction, improves the quality for the services offered and increases customers' satisfaction[1].

However, adopting measures that result from a diversity of political priorities, usually from establishing guidelines that contain and reduce expenses, can be noticed immediately in health institutions' human resources policies[2]. Therefore, despite the fundamental role nursing services play in care practice within these organizations, the need for decreasing costs and increasing the service offered immediately places health institution's nursing personnel in a difficult situation. As a result, personnel costs are the largest portion of overall costs[3-4].

For this reason, nurses who are responsible for personnel and for the coordination of nursing care are constantly involved resolving problems regarding the lack of personnel. Consequently, they must identify methods, criteria and parameters that will help them estimate and evaluate the personnel staff under their responsibility.

In Brazil, the Gaidzinsk nursing personnel measurement method has been used for performing these activities as well as helping nurses to predict, evaluate and adjust the quantity and quality of nursing personnel in health organizations[3]. In order to use this method, the identification of the following variables is necessary: the unit's load of work, technical safety rate (TSR) and effective working time[4].

According to the nursing team's degree of dependency, work load in the nursing care unit is defined by result of the average quantity of patients, and by the average nursing care time used per client. The daily patient average, according to the nursing team's degree of dependency, is obtained by a daily classification of patients. In order to perform this task, a patient classification instrument is elected among those available in literature[4].

Identification of the time used for patient care is considered to be the most complex process of the nursing personnel measurement methods due to the fact that it interferes in its definition. Because of the instrumental and operational difficulties for performing this procedure, the nursing care time referred to in the literature can be tested and validated within the reality of each service[4].

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By professional category, TSR refers to the increase in nursing personnel quantity, in order to cover for the predicted and non-predicted absences on care service, and it must be identified according to the reality of each service, with a view to the availability of methods that will enable the identification of such values[4].

The effective working time variable considers the daily working time of the nursing team and the need to reduce working hours in order to perform activities not related to professional activities (exchange information not connected to work, celebrations)[4]. Some variables are part of the Consolidated Labor Laws (CLL)[5] (physiologic needs calls, meals, periods of rest), which happen throughout the working shift. Therefore, the effective working time is determined according to the reduction of work hours by the professional based on the available productivity rates in literature[4].

In addition to a method that allows for systematizing the inter-relationship of variables that will interfere in its effectiveness, this framework demonstrates that the process of putting the nursing personnel measurement technique into practice requires the adoption of parameters that will enable the planning and the evaluation (quantitatively and qualitatively) of nursing personnel according to patients' care needs.

The measurement method proposed by the author[3] is consolidated in the Brazilian scenario. However, once the TSR can be identified according to each institution's situation, the election of related parameters, mainly to nursing care hours and effective working hours, still demonstrates as a critical aspect for putting of this technique into practice[6].

Because of the existing official regulation for the nursing personnel measurement process, the Federal Nursing Service Council (FNSC)[7] established parameters for measurement professionals in health institutions. Based on PCS[8], the FNSC Resolution # 293/04[7] indicates the minimum care hours for each type of care and recommends that working hours must be observed based on the contract established by health institutions.

For each care category, the average hours for care predetermined by the FNSC[7] were established by nurses and care unit managers from many regions of the country consultations. They suggest that the ideal scenario for nursing professionals is to care for a specific number of minimum, intermediate, semi-intensive and intensive care patients. Hence, we can observe that this proposition was performed based on patients' care needs evaluation and although not explained in the Resolution[7], we can infer that they refer to the direct and indirect care for patients[2,6].

Literature shows various studies [9-15] that analyze the activities developed by the nursing team and mainly those undertaken by nurses to evaluate the professionals' work-

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ing time distribution. Although these studies are not directly comparable due to differences in definitions and the adopted methodologies, they do demonstrate that in addition to direct and indirect care activities, nursing professionals undertake other activities, many of which are not specifically related to nursing services. Therefore, in addition to considering the total working time of a nursing professional in the quantity of anticipated hours, ignoring rest periods provided for in Brazilian legislation, the FNSC[7] also failed to consider the fact that these professionals undertake a series of activities, not related to those direct and indirect care for patients, while their time is being considered for these actions[6].

OBJECTIVE

Considering the impact of the nursing team's working time distribution has on determining the appropriate parameters for measurement nursing personnel, the study aims at identifying and analyzing nurses' working time distribution in a surgical-medical unit.

METHOD

Type of research

To analyze a field descriptive-exploratory prospective research under a quantitative approach.

Study location

The research was carried out in the Surgical-Medical Clinic Unit of São Camilo Pompéia Maternity Hospital. The unit has 37 active beds for adult patients carrying acute or chronic surgical clinical pathologies. All beds were distributed on the same floor (3rd Floor), in Blocks I (25 beds) and II (12 beds).

Working in the Unit was a head nurse, ten registered nurses and 35 enrolled nurses, distributed into four periods: morning, afternoon, odd nights and even nights.

In other Units, nurses from the Surgical-medical Clinic developed four phases in the nursing process: history, diagnosis, evolution and nursing prescription.

Ethic aspects

The research was approved by the Research Ethics Committee (REC) of the São Camilo University Center (protocol # 055/07). The free and informed consent form was signed by the nurses participating in the research.

Population/sample

In order to meet the objectives, the activities undertaken by nurses during their working shifts were considered as the statistics population. Therefore, the population comprises the total of activities undertaken by nurses during the continuous functioning of the unit.

This compound of activities $A_1, A_2, A_3, ..., A_i$, present distinct time periods, considered as random variables $d_1, d_2, d_3, ... , d_i$.

Since the population size N (activities) is unlimited due to the continuity of services (there are always new activities) and activity A_i has a variable execution time for each new service i, the exact value of each one of these population parameters cannot be determined. Only converging values can be obtained as new population samples are continuously taken.

Considering that the quantity of activities performed by nurses is unpredictable and that some activities occur more frequently than others, theoretically all activities can occur as long as a sample of activities, undertaken by nurses, occur for a sufficient period so that those that occur less frequently can occur.

Therefore, as a criterion to establish the sample size, we chose to discard activities that held occurrence probability p lower than 0.1%. In other words, $p=1/1000$ (or less than one occurrence in 1000 samples), where at least 1000 samples of the activities undertaken by nurses must be collected.

In order to determine the sample's period T that was enough for composing the activities compound that held a previously established occurrence probability p, the following equation was elaborated:

$$T = \frac{\tau}{1440 \cdot p \cdot e_{nf}} \quad (1)$$

Where:

T = sample period;

τ = interlude between activities observations, expressed in minutes;

p = minimum probability of occurrence for an activity (0.001);

and_{nf} = number of nurses per shift (02);

1440 = 24h X 60 minutes.

In order to determine the interlude between observations (τ), an interlude of 15 minutes between an observation and other activities performed by nurses was established. Therefore, the sample period corresponded to 5.2 days.

Methodological procedures - identification and classification of nursing activities

Nurses were required to list in writing the daily activities undertaken by them at work in the Hospital Unit.

These lists provided by nurses were grouped. Then a single list of activities was discussed among the nurses to

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include or exclude any nursing activity and also eliminate possible doubts regarding the name of the activity and its real meaning.

Then, the activities were set into categories based on a standard language system that aimed at setting a common meaning for terms used in professional practice, resulting in reducing imprecision from semantics ambiguity. Also, it aimed at comparing the activities undertaken by nurses into different scenarios. In order to perform these procedures, the Nursing Interventions Classification (NIC)[16] was chosen. It denominates and describes interventions nursing professionals undertake in clinical practice as a response to an established nursing diagnosis[17].

Each nursing activity in the single list were compared with these definitions and with the activities described in each NIC intervention[16]. Those that corresponded to a certain nursing intervention were grouped under a standard intervention. After this procedure, interventions were classified as direct and indirect care interventions according to the definitions in NIC[16]:

• Direct care interventions: treatment carried out through patients' interaction, including nursing actions in the physiologic and psychosocial scope, and also, practice actions and those for support and life counseling.

• Indirect care interventions: patient treatment performed from a distance; however, benefiting patients or group of patients, comprehending actions guided to care environment management and interdisciplinary collaboration. These actions support the efficiency of direct care interventions.

Activities that showed no accordance to any interventions in NIC[16] were grouped into two categories: Associated Activities - related to work, although not specific to the nurse and nursing, but that can be undertaken by any other professional in the Unit[13] and Personal Time - activities regarding the workers' personal necessities[13,18], that have no connection to the work to professional tasks.

Construction of the instrument for data collection

Interventions and nursing activities classification enabled the elaboration of the data collection instrument, for the observation of one nurse per instrument, according to shifts and working wards. The first field in the instrument indicated the data collection location (ward I or II) and was used for registering information related to the date and the nurses' identification (name initials). The second field had the nursing interventions list (with the respective codes and related activities), the associated activities and personal time. Also, it presented a specific checklist system for each ward and working shift in the Unit.

Data collection procedure.

In order to perform observation and register the activities undertaken by nurses, four clerks who worked in the institution were hired. They were chosen because they knew the work being developed by the nursing team, provided that they signed a service provider contract. These clerks, called field observers, were oriented on procedures related to research data registration and collection. They were specifically trained to develop the activity.

While collecting data, the field observers were distributed into the four working shifts (6a.m. to 12p.m.; 12p.m. to 6p.m.; 6p.m. to 12 a.m.; 12a.m. to 6a.m.). They started their activity as the shift started. In order to regulate the time between one observation and another, they used a watch as measuring instrument.

Identifying Nurses' time distribution used in undertaking nursing activities.

The proportion of nurses' time in undertaking the main nursing interventions was obtained through the following equation:

$$[P_i\%]_I = \left[\frac{100 \cdot (\sum_i \tau)}{\sum_T \tau} \right]_I \quad (2)$$

$[P_i\%]_I$ = Activity Percentage i in the period T of the sample;

$\sum_i \tau$ = sum of all interludes between samples where the activity occurred i;

$\sum_T \tau$ = sum of all interludes between samples that occurred during the sample T.

Identifying the time proportion that nurses used in each nursing activity was made by summing up possible activity percentages categorized under the same intervention. As a result, the corresponding percentage for each one of the selected interventions was obtained. Afterwards, the value of all classified interventions as direct care, indirect care and activities classified as Associated or Personal Time were summed. A working time distribution for nurses was established according to the classification adopted in this present study.

RESULTS AND DISCUSSION

Population/sample

The need for 1000 activity samples was considered to be as necessary to achieve the objectives of the study. The sample period, calculated by establishing criteria related to the time interlude between nurses' activities observation (15 minutes) and the number of professionals per shift (two), corresponded to 5.2 days. However, since there were some shifts at data collection, the activities undertaken by three nurses were observed and the quantity of needed samples for developing the study was achieved throughout five days of sample period, from the 15th to the 19th of

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October, 2007. Therefore, 1032 samples of activities undertaken by nurses in the Unit were obtained.

Nurses' profile participating in the study

Twelve nurses working in the Unit during data collection took part in this research. Most (66.7%) were females, aged between 40 and 49 years (50%). Regarding professional education graduation time, five nurses (41.7%) graduated more than ten years ago, four nurses (33.3%) graduated between five and nine years ago and three nurses (25%) had graduated less than five years ago. Four nurses (33.3%) had been employed for more than ten years, one nurse (8.3%) worked in the institution for five years and seven nurses (58.4%) worked in the institution for less than 5 years.

Identification and classification of nursing activities

The activities lists comprised 150 nursing activities. From the 150 listed nursing activities, 138 (92%) corresponded to the definitions and activities described in 45 NIC interventions[16]. Hence, they were categorized according to the equivalent intervention.

The 45 selected nursing interventions were classified into 31 direct care interventions and 14 indirect care interventions, according to NIC definitions[16]. Twelve (8%) of the 150 activities in the Surgical-medical Clinic Unit did not correspond to any NIC nursing interventions[16]. Thus, these activities were classified as Personal Time and Associated Activities.

Identifying Nurses' time distribution used in undertaking nursing activities.

From the 45 selected nursing interventions, only 32 (71%) were observed during the data collection period. The 13 (29%) nursing interventions that remained unregistered and the nursing activities that were attributed to these interventions were excluded from the sample.

The records obtained were transferred to electronic spreadsheets, which allowed for the identification and addition of all interludes between samples that each activity occurred, in addition to all interludes between samples that were verified during the sample period *T.* Thus, it was possible to make calculations that enabled determining the nurse time proportion caring for each observed intervention and activity (Associated and Personal Time) in each block and in the Unit as a whole.

The nursing interventions related to work activity showed that more nurses' spent their time in Documentation (18.4%), Supervision (11.4%), Associated Activities (9.7%) and Delegation (9.3%) respectively.

The activities related to Documentation, which used the most time (18.4%), comprised the following actions: perform daily nursing evolution (7.5%), perform daily nursing prescription (5.1%), write the shift summary in the shift change log book (elaborating the shift report) (3.8%) and taking notes (2.0%).

By analyzing these results, only two studies stood out[9-10] pointing to the time taken by nurses for documentation (9% and 23%, respectively), however, not clarifying the type of documentation. One of these studies[9] also presented data related to the elaboration of reports (8%). Therefore, the percentage found in this present study is similar only to the percentage found in one of the listed studies[9], if percentages regarding documentation and elaboration of reports are added (17%).

The study Unit has a computerized system that allows for carrying out the nursing evolution and prescription in an electronic environment. It aims at also enabling higher agility in registering this information. However, results found in the present research suggest the need for performing new investigations or validations of intervening factors in undertaking these interventions in a way to reduce nurses' working time dedicated for Documentation.

The activities related to supervision, which took 11.4% of the nurses' working time refer to undertaking actions related to acquiring and continuous interpreting patients' data. They hold a view to clinical decision making and were not solely analyzed by researchers that developed studies on this theme. However, they constitute an important activity undertaken by nurses, guided to planning and implementing nursing care for patients.

The percentage of time dedicated by nurses in associated activities, not specific to nurses, was considered only in two studies[11,13]. They identified respectively the following percentages 7% and 21%. In the present research, nurses demonstrated that they used 9.7% of their time in this kind of activity.

Once a certain type of task emphasis is determined by the characteristics of each institution, each service and also by nursing professionals' beliefs and values, these results demonstrate the need for nurses and health institutions to review their working processes, searching concentrated efforts to make more time available for undertaking specific professional activities, increasing, consequently, workers motivation, care quality and nursing team productivity[6].

Regarding intervention Delegation, nurses for the Surgical-medical Clinic Unit from São Camilo Maternity Hospital demonstrated that they used 9.3% of their time in activities related to guiding other professionals in the nursing team.

The proportion of time used for each intervention and activity group in the Surgical-medical Clinic was calculated according to the classification adopted in this study (direct care interventions, indirect care interventions, associated activities and personal time). The percentage of time nurses' dedicated to each one of the nursing interventions and activities is illustrated in Figure 1.
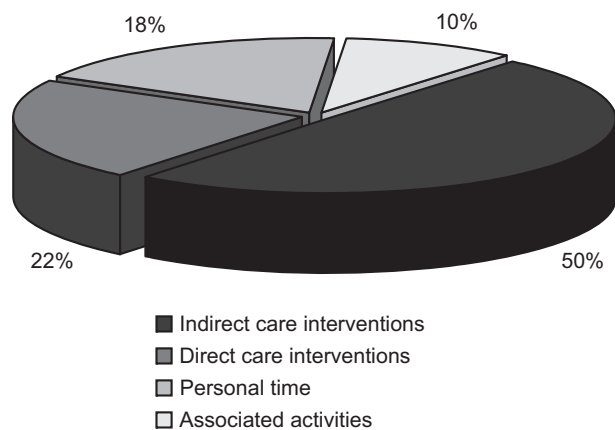
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18%   10%

22%   50%

■ Indirect care interventions
■ Direct care interventions
■ Personal time
□ Associated activities

Figure 1 - Percentage distribution of nurses' working time in the Surgical-medical Clinic Unit according to the adopted classification - São Paulo - 2008

Nurses from the Surgical-medical Clinic Unit from São Camilo Pompéia Hospital spent 50% of their working time in indirect care activities, 22% in direct care activities, 18% in personal time activities, and 10% in associated activities or in activities not specific to nurses (Figure 1). These data corroborate with a few studies that, although they cannot be directly compared due to differences in definitions and adopted methodologies, demonstrate nurses dedicate most part of their working time to non-related to direct patient care activities.

However, results from other studies[10-15] demonstrated that nurses spent more working time in direct patient care activities (36%, 30%, 39%, 40%, 49.9% and 32%) than the s present study (22%).

Regarding indirect care activities, the percentages found other studies are inferior to the percentages observed in the present study. However, for those activities related to general maintenance and documentation, most developed studies have classified the listed activities independently from indirect care activities. On the contrary, the present study, classified some of these activities as indirect care interventions (documentation, supply control, checking of the emergency cart). Therefore, we can verify that if these activities are considered to be indirect care activities, the time spent by nurses in these activities become compatible with the results observed in the studied Unit.

The percentage of time dedicated by nurses of the Surgical-medical Clinic Unit of São Camilo Pompéia Maternity Hospital in associated activities corresponded to 10% of the

nurses' working time in the Unit. They also present higher conformity with the 7% percentage observed in one of the studies available in literature[11].

Personal time activities in this study were greater at 18% than the personal time activities in other studies 4%, 14%, 13% and 13%[9-10,12,15]. However, the personal time activity in the study corresponds with studies developed in the United Kingdom[13] where the average was 17%.

When analyzing the data found in the studied Unit, 18% of the working hours in the ward was not dedicated to activities related to work; therefore, professional efficiency was 82%. This value was within the range considered to be normal for work and, according to productivity evaluation criteria proposed by literature[19]; is regarded as an excellent productivity index.

Results found in the study agrees with other studies[3-4,6] who state the need for considering the nurse's personal time as well as associated activities in the personnel measurement methods anticipated by officials organizations.

FINAL CONSIDERATIONS

Data analysis shows that the objectives were achieved within conditions and criteria established for the development of the study.

Nurses in the Surgical-medical Clinic Unit of São Camilo Pompéia Maternity Hospital demonstrated that they spent 50% of their working time in indirect care interventions, 22% in direct care interventions, 18% in personal time, and 10% in associated activities not specific to nurses. These data agrees with other studies that note that nurses use most of their working time in activities not related to patients' direct care.

Identifying the percentage of time nurses' dedicate to activities classified as personal time verifies that their efficiency corresponds to 82%. According to evaluation criteria available in literature, this index is considered to be an excellent productivity index.

Results found in the present study reaffirm the need to consider personal time as well as associated activities in personnel measurement methods anticipated by official organizations.

The study demonstrates perspectives for carrying out new investigations that improve parameters related to nursing personnel measurement in hospital institutions.

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