Nurses' work time distribution at the emergency service*

DISTRIBUIÇÃO DO TEMPO DE TRABALHO DAS ENFERMEIRAS EM UNIDADE DE EMERGÊNCIA

DISTRIBUCIÓN DEL TIEMPO DE TRABAJO DE LAS ENFERMERAS EN UNIDAD DE EMERGENCIA

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ABSTRACT

The objective of this quantitative, descriptive, case study was to identify and analyze the distribution of nurses' work time at an emergency service. To do this, the work sampling method was used. The nursing activities performed by the studied nurses were identified by evaluating the patient care forms and by direct observation of nurses during their everyday work routine at the service. The identified activities were then categorized according to a standardized language system. It was found that 35% of the nurses' time was dedicated to indirect care interventions, 35% to direct care interventions, 18% to private time activities and 12% to related activities. The average productivity of the studied workers was 82%. This study provided evidence of perspectives to perform further research to identify the parameters that would support the process of rightsizing nursing personnel at emergency services.

KEY WORDS
Nursing staff, hospital.
Time management.
Personnel administration, hospital.
Emergency nursing.
Workload.

RESUMO

Esta pesquisa de natureza quantitativa, descritiva, do tipo estudo de caso, teve por objetivo identificar e analisar a distribuição do tempo de trabalho das enfermeiras em uma unidade de emergência. Para alcançar os objetivos, utilizou-se o método de amostragem de trabalho. A identificação das atividades de enfermagem, realizadas pelas enfermeiras, ocorreu mediante avaliação das fichas de atendimento dos pacientes e da observação direta das enfermeiras no cotidiano de trabalho da unidade. As atividades identificadas foram posteriormente categorizadas de acordo com um sistema padronizado de linguagem. Verificou-se que 35% do tempo das enfermeiras são dedicados às intervenções de cuidado indireto, 35% às intervenções de cuidado direto, 18% às atividades de tempo pessoal e 12% às atividades associadas. A produtividade média destas profissionais correspondeu a 82%. Com este estudo, evidenciam-se perspectivas de realizar novas investigações no sentido de identificar parâmetros que subsidiem o processo de dimensionar o pessoal de enfermagem em unidades de emergência.

DESCRITORES
Recursos humanos de enfermagem no hospital.
Gerenciamento do tempo.
Administração de recursos humanos em hospitais.
Enfermagem em emergência.
Carga de trabalho.

RESUMEN

La investigación, de naturaleza cuantitativa, descriptiva, del tipo de estudio de caso, tuvo por objetivo identificar y analizar la distribución del tiempo de trabajo de las enfermeras en una unidad de emergencias. Para alcanzar tales objetivos se utilizó el método de muestreo de trabajo. La identificación de las actividades de enfermería realizadas por las enfermeras se efectuó a través de evaluación de las fichas de atención de los pacientes y de la observación directa de las enfermeras en su rutina de trabajo en la Unidad. Las actividades identificadas fueron posteriormente categorizadas de acuerdo con un sistema estandarizado de lenguaje. Se verificó que el 35% del tiempo de las enfermeras fui destinado a las intervenciones de cuidado indirecto, otro 35% a las intervenciones de cuidado directo, 18% a actividades de tiempo personal y 12% a actividades asociadas. La productividad media de las profesionales evaluadas correspondió a un 82%. Con este estudio se ponen en evidencia perspectivas para la realización de nuevas investigaciones que contribuyan en la identificación de parámetros que ayuden al proceso de dimensionar personal de enfermería en unidades de emergencias.

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

Emergency services are important components of the national health system. They serve to deliver care to patients with acute health problems, with or without death risk, needing professionals who are prepared for immediate client care delivery.

Organized to deliver immediate care and facilities to perform diagnostic and therapeutic procedures, they often constitute the population's main reference when seeking medical care, due to the care network's lack of structure and low problem-solving ability in other health system components.

The technologies used at these units do not always guarantee care quality though, as aspects related to the object and workforce involved in this process play a decisive role[1].

Unrestricted access, associated with other factors, such as the lack of availability of hospital beds, increased life expectancy of the population, high criminality and accident ratios contribute to growing demands and large patient flows, directly interfering in the service's operating capacity and efficacy.

In this context, nurses working at emergency units are in constant alert as, besides performing their activities in an environment marked by unpredictability and uncertainties, demanding knowledge, rapid reasoning and readiness for decision making, available staff numbers are insufficient to respond to the patients' urgent needs.

In this scenario, nursing staff dimensioning gains an important meaning, to the extent that it attempts to adequate available staff to the client's care needs, institutional goals and internal and external clients' expectations[2].

These nurses are frequently involved in the need to equate problems related to lack of staff and, consequently, in the identification of methods and parameters to support estimates and assessments of the staff they are responsible for[3].

At emergency units, however, the problem related to nursing human resource planning, allocation and assessment gains larger proportions due, among other aspects, to the work dynamics at the unit; to the range of actions performed; to patient turnover and the lack of parameters, making it difficult to operate with conventional nursing staff dimensioning methods.

Workload identification has been appointed as key to the determination of nursing professionals. To identify this variable, it is necessary to measure the time nursing spends to deliver both direct and indirect client care, also consid-

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ering the time used to see to a specific client and permit data collection on the entire care process[4].

In this perspective, the work load is determined through the identification of the interventions patients require (direct and indirect care) and the time the nursing team spends to accomplish them[5].

Literature evidences different studies[3,5-6] that aimed to analyze nursing team activities, and particularly those nurses perform, with a view to assessing the work time this professionals category spends, identifying the team's work load and productivity and reviewing work processes, so as to optimize the nurses' time, improve care quality and reduce care costs.

These studies showed that nursing workers perform different activities, many of which are not specifically related to nursing, and appoint the need for nurses and health institutions to reconsider their work processes, attempting to concentrate efforts to make available more time for the accomplishment of specific professional activities[7].

The analysis of this reference framework reveals the importance of research on nursing team activities, as well as on the distribution and use of nursing professionals' work time, given its interference in the operationalization of the staff dimensioning process, as these professionals may also perform a series of other activities, not directly related to attending to the patients' care needs, while their work time is taken into account in the accomplishment of these actions[7].

OBJECTIVE

In view of the relevant role, mainly of emergency care nurses, this study aimed to: identify and analyze the distribution of nurses' work time at an emergency unit.

METHOD

Research design

A quantitative, descriptive case study was carried out.

Place of study

The study was carried out at the Emergency Unit of the University of São Paulo's University Hospital, called the Adult Emergency Care (AEC) at the institution.

The goals of the AEC at HU-USP are to prioritize care delivery to patients with immediate care needs, as well as to assess and identify crisis and acute disease situations[8].

Patient care is delivered uninterruptedly, with support services necessary for medium-complexity hospital care.

Emergency care services follow Advanced Cardiac Life Support and Advanced Trauma Life Support[8] recommended standards.

On the average, 25,000 patients are attended per month, approximately 700 of whom remain under observation for different periods, depending on the severity, hospitalization need and bed availability in the public hospital network. The most frequent care types derive from cardiovascular complications, metabolic disorders, infectious diseases, trauma and orthopedic cases[8].

The nursing staff comprises one Section Head, 14 assistant nurses, 51 nursing technicians/auxiliaries and one administrative technicians, distributed across four shifts: morning, afternoon, even night and uneven night[8]. The weekly work load is 36 hours, with six (morning and afternoon) and 12x36 hour shifts (night).

The mean number of professionals per shift is three nurses and nine nursing technicians/auxiliaries[8]. The nurses daily distribution across different shifts demands the presence of at least one professional at the place destined for patient observation (Observation), and another responsible for the *Areas*, including the emergency room, dressing, small surgery and cast, besides care delivery to *extra* patients, i.e. patients who remained under observation on the Unit corridors due to the unavailability of beds in Observation.

For nursing care practice, in line with the Nursing Department's care philosophy, the nurses develop the nursing process, which is called Nursing Care Systemization (NCS) at the Institution.

Study participants

Study participants were all nurses who worked at the AEC of HU-USP during the data collection period.

Ethical aspects

Approval for the research was obtained from the Research Ethics Committee at HU-USP (protocol number 801/08). The nurses who participated signed the free and informed consent term.

Methodological procedures

Identification and classification of nursing activities nurses perform at the AEC

The activities AEC nurses perform were identified through the nursing care records in the patient files and care forms, as well as direct observation of these professionals during the different shifts and at the Unit's different areas.

The list of identified activities was presented and discussed with the nurses and the Section head, with a view to its validation, inclusion or exclusion of some activity, as well as clarification regarding possible doubts on their names and meanings.

With a view to standardizing the language, permitting its understanding and comparison among activities performed in different scenarios, the list of activities the nurses approved was categorized according to the Nursing Intervention Classification (NIC)[9].

Each listed nursing activity, representing the activities the AEC nurses developed, was compared with the definitions and activities described in the NIC, as well as with the class definitions and corresponding domains. Activities that corresponded to a certain nursing intervention were grouped under the standardized intervention.

After this procedure, the interventions were classified as direct and indirect care interventions, in accordance with the NIC definition NIC[9]:

• Direct care interventions: treatment performed through interaction with the client(s), including both physiological and psychosocial nursing actions, both the *laying on of hands* actions and those that are more supportive and counseling in nature.

• Indirect care interventions: treatment performed away from the client but on behalf of a client or group of clients, including nursing actions aimed at management of the client care environment and interdisciplinary collaboration. These actions support the effectiveness of the direct care interventions.

Activities without correspondence with the NIC taxonomy were grouped under associated activities and personal activities.

Associated activities were considered those not specific of nursing and which, therefore, could be performed by other professionals[10].

Activities classified as personal time are related to pauses in the work journey to see to the professionals' personal needs[10].

Construction of data collection instrument

The classification of the nursing interventions and activities permitted the elaboration of the data collection instrument, aimed at observing one nurse per instrument, according to the shifts and work areas. The first field in the instrument indicated the data collection site (Observation or Areas) and served to register information related to the date and nurses' identification (initials).

The second field showed the list of nursing interventions, associated and personal activities. It also displayed a specific checking system for each site and work shift at the Unit, besides room to register possible activities the instrument did not address.

Nurses' work time distribution at the emergency service
Garcia EA, Fugulin FMT

Rev Esc Enferm USP
2010; 44(4):1027-33
www.ee.usp.br/reeusp/
1029

Data collection procedure

To achieve the research goals, the work sampling method was used.

Work sampling uses intermittent direct observation to register the activities performed by a worker or group of workers. Based on the accumulated data over time, the proportion of time spent on specific activities can be calculated[11].

Determination of sample size

The sample size, i.e. the number of observations needed, was determined considering that:

• The probability that the intervention/activity would occur was higher than 0.1%, that is p = 1/1000;

• The time interval between observations equaled 10 minutes;

• The mean number of nurses per shift was two.

To calculate the sample period, the equation below was used[5]:

$$T = \frac{N_i \cdot \tau}{1440 \cdot \overline{E}}$$

Where:
T = sample period (days);
N_i = sample size;
τ = interval between samples;
1440 = minutes in a day;
E = mean number of nurses per shift

Substituting the values (N_i = 1000; τ = 10; E=2) in the above equation shows that, to obtain 1000 samples of the nurses' work, 3.47 days of data collection would be needed. As this number corresponds to the sample limit (1000), the researchers decided to expand the number of data collection days to four, increasing the study's security margin with regard to the nurses' observation. Thus, for a four-day period, 1152 samples of nurses' work are obtained.

Operational data collection

Data were collected during four consecutive and uninterrupted days, by six observers who had been oriented and trained to perform the procedure.

The observers followed the nurses during the shifts and, every ten minutes, they wrote down the activities these professionals performed. During the data collection period, the observers were distributed across the four work shifts (7:00 till 13:00; 13:00 till 19:00; 19:00 till 1:00 and 1:00 till 7:00), with two observing the morning and afternoon shifts and one the other shifts. The observers' activities started together with the nurses' activities.

The collected registers were transferred to electronic worksheets to identify and add up all sample intervals in which each of the activities occurred, as well as all sample intervals verified during sample period **T**, based on which the calculations were made to determine the proportion of time the nurse dedicated to each intervention and (Associated and Personal) activity observed.

Identification of nurses' time distribution

The proportion of time the nurses occupied to perform the main nursing interventions was calculated by applying the following equation[3]:

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

Where:

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

$\sum_i \tau$ = sum of all sample intervals during which activity **i** occurred;

$\sum_T \tau$ = sum of all sample intervals that occurred during sample period **T**.

The identification of the proportion of time the nurses occupied to perform each nursing activity permitted adding up the percentages for activities categorized under the same intervention, resulting in the percentage correspond to each of the selected interventions. The proportion of the nurses' time distribution across direct and indirect care interventions, associated and personal activities was calculated by adding up the proportions of time these professionals occupied to perform all interventions/activities corresponding to the pertinent classification.

RESULTS AND DISCUSSION

Profile of nurses-study participants

Research participants were 13 nurses who worked at the AEC during the data collection period. It was verified that all professionals were women. Six (46%) were between 23 and 30 years old, two (15%) between 31 and 40 years, four (31%) between 41 and 50 years and one nurse (8%) over 50 years of age. With regard to the time since graduation, three (23%) nurses had graduated less than one year earlier, two (15%) between one and five years, four (30%) between five and ten years, two (15%) between ten and fifteen years, one (8.5%) between fifteen and twenty years and one (8.5%) more than 20 years earlier. As for the work time at the institution, three (23%) nurses had been hired less than one year earlier, two (15%) between one and five years, four (31%) between five and ten years and four (31%) between ten and fifteen years.

Identification and classification of nursing activities

The activity list elaborated based on the registers and observation of nurses' work resulted in 233 activities. During the review and categorization process of the identified

activities according to the NIC taxonomy, this activity list was restricted to 197, as activities representing the same action were grouped, constituting one single activity. In that group, 163 (83%) corresponded to the definitions and activities described in NIC interventions.

The activities' categorization according to the NIC taxonomy resulted in five domains, 17 classes and 63 interventions. The selected 63 nursing interventions were classified in 43 direct and 20 indirect care interventions, according to NIC definitions[9]. Out of the 34 (17%) activities without correspondence with NIC nursing interventions, 23 (12%) were categorized as associated activities and ten (5%) as personal activities.

One single activity (*preparing material for sterilization*) could not be classified, due to the lack of correspondence with the adopted categories. This activity was classified as *Other Activity*.

Proportional distribution of nurses' work time

The data were collected on November 11th-14th 2008. During some shifts, activities by more than two nurses were observed, totaling 1512 samples of performed activities.

In the group of 63 selected nursing interventions, 06 (9.5%) were not observed during the data collection period.

The six (9.5%) nursing interventions that remained unregistered and the nursing activities attributed to these interventions were excluded from the sample.

The nursing interventions and activities that consumed most of the nurses' work time were: Shift Transfer (8.79%), Admission Care (7.40%), Documentation (6.74%), Health Care Information Exchange (5.42%), Delegation (4.36%), Transport (3.44%).

The analysis of these results in view of existing research on the theme reveals that only two studies[3,5] evidenced the time the nurses spent on shift transfer. The percentage found in this research is higher than findings from related studies: 7.1%[3] and 4.8%[5]. Shift Transfer activities at the AEC include written preparation of shift transfer for patients under observation; receiving and transferring the sector shift and reading the book of unexpected events. Among these activities, the written preparation of the shift transfer takes up a significant part of nurses' time.

Admission Care represents the second intervention on which the nurses spend a larger proportion of time (7.40%), higher than findings from another study (3.1%)[3].

Documentation was the third most frequent intervention at the AEC-HU. The percentage found was lower that findings from other studies: 18.4%[3], 20.5%[5] and 9.3%[12], respectively.

The percentage identified in this research for Health Care Information Exchange was higher than findings from a Brazilian study (1.3%)[3] and lower than findings from another study in the international context (11%)[6].

Delegation took up 4.36% of the nurses' time. This percentage is lower than findings from other studies[3,9], which registered 9.3% and 12%, respectively.

Transport occupied 3.44% of AEC nurses' time. This percentage can be considered high in comparison with different authors' findings: 1.3%, 1.1% and 0.4%[3,5,13]. This difference should be related with the Unit's characteristic, where patient circulation between AEC areas and other Units at the Institution (Graphical Methods, Radiology, Surgical Center and Hospitalization Units) is more frequent.

Based on the identification of the percentage of time the nurses dedicated to each nursing intervention and activity, the proportion of time spent to perform each intervention and activity group at the AEC was calculated, according to the classification adopted in this research (direct care interventions, indirect care interventions, associated activities and personal activities). The figure below illustrates the obtained results:
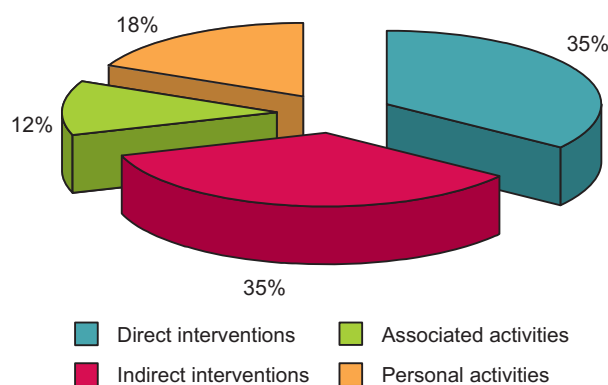
Figure 1 - Percentage distribution of nurses' work time at the AEC, HU-USP, on November 11th-14th 2008, according to the adopted classification - São Paulo - 2008

These data show that the nurses spend the same proportion of work time on the accomplishment of direct and indirect care interventions, which differs from other researchers' observations[3,5-7,11-13].

A study on nurses' time distribution, carried out at a medical-surgical clinical unit[3], showed that 50% of time was destined for indirect care interventions, 22% for direct care interventions, 18% for personal activities and 10% for associated activities.

In a study carried out at a rooming-in unit[5], it was identified that 39% of the nurses' work time was dedicated at direct care interventions, 43% at indirect care interventions, 7.0% at associated activities and 11% at pauses from work.

In literature, other studies[6,10,12-14] are found, carried out in varying realities, using different definitions and methodological procedures, which also identified the percentage distribution of nurses' work time, demonstrating that the nurses spent, respectively, 42%, 40%, 27%, 32%

Nurses' work time distribution at the
emergency service
Garcia EA, Fugulin FMT

Rev Esc Enferm USP
2010; 44(4):1027-33
www.ee.usp.br/reeusp/ 1031

and 30% of their work time on the execution of direct care activities.

With respect to indirect care activities, the result found in this research (35%) is lower than that from another research[13], which identified that nurses spent 48% of their time on indirect care activities.

The balance observed between the proportion of time the AEC nurses spent on direct and indirect care interventions may be related with the type of unit, which sees to patients with immediate care needs. The percentage relation between the number of nurses and other nursing staff categories at the Unit (21%) may suggest the nurses' elevated commitment with care delivery at the AEC.

With regard to associated activities, the nurses dedicate 12% of their time to non-specific activities. This percentage is higher than in most other studies on the theme, whose results showed 9.7%, 2.3%, 7.8% and 7%[3,5,12,14].

Activities classified as Associated corresponded to: organizing printed documents and patient files; printing patient identification labels; printing test results; picking up/taking material or medication to other units; locating documents, material, unit professionals, patients and companions; activating the transport service (ambulance), among others. This shows that the AEC nurses perform a range of activities that could be attributed to the administrative assistant. Only one professional from this category is available at the Unit though, who works office hours (8:00 till 17:00) and is also responsible for secretarial work for the Unit head.

Identifying the percentage of time the nurses spend on personal activities permits calculating these professionals' productivity, by reducing the hours professionals have available during their work shifts, according to the proportion of time used to see to their personal needs or the sum of the proportions of time spent on direct and indirect care and associated interventions.

Personal activities represented about 18% of nurses' work time at the AEC. This percentage corresponds to other studies' findings (17%, 17.8% and 18.8%)[3,10,12], but exceeds percentages found in yet other research (8%, 10% and 13%)[5,7,13].

Hence, as 18% of the nurses' work time at the AEC was spent on personal activities, these professionals' mean productivity is 82%, which means an average 60-minute pause in a six-hour work journey.

This ratio is considered excellent according to the productivity assessment criteria proposed in literature[15] and within the interval recommended by researchers on the theme[16].

FINAL CONSIDERATIONS

This research permitted the identification and analysis of nurses' work time distribution at the AEC of HU-USP.

These nurses spent 35% of their work time on indirect care interventions, 35% on direct care interventions; 18% on personal activities and 12% on associated activities, i.e. not specific to nurses.

These data diverge from some studies that demonstrated that nurses dedicate most of their time to activities not related to direct patient care and suggest the nurses' high degree of commitment to care delivered at the study unit.

Associated activities nurses perform are related to tasks the administrative assistant could do. This result indicates the need to review work processes at the Unit, seeking strategies that allow these professionals to spend more time on specific activities.

The identification of the time percentage nurses spend on personal activities revealed that these professionals' efficiency level corresponds to 82%, considered an excellent productivity ratio according to the assessment criteria available in literature.

Through this study, perspectives for further research are evidenced, with a view to the identification and validation of parameters that can contribute to put in practice nursing staff dimensioning at emergency units.

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