

Time and quality of admissions: nursing workload

Tempo e qualidade das admissões: carga de trabalho em enfermagem

Tiempo y calidad de las admisiones: carga de trabajo en enfermería

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How to cite this article:

Trovó SA, Cucolo DF, Perroca MG. Time and quality of admissions: nursing workload. Rev Bras Enferm. 2020;73(5):e20190267. doi: <http://dx.doi.org/10.1590/0034-7167-2019-0267>

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EDITOR IN CHIEF: Antonio José de Almeida Filho

ASSOCIATE EDITOR: Hugo Fernandes

Submission: 01-24-2019 **Approval:** 11-15-2019

ABSTRACT

Objectives: to measure the average time spent by the nursing staff during patient admission and investigate their compliance with the activities described by the Nursing Interventions Classification; evaluate the degree of interference in the workload of the team. **Methods:** observational with time measurement through software. We followed 199 admissions made by the nursing staff in seven units, using two validated instruments. Total scores $\geq 70\%$ and 50% validated the process. **Results:** the average time of nurses ranged from 5.5 (standard deviation = 2.3) to 13 (standard deviation = 1.1) minutes; and the auxiliary / technician, between 4.7 (standard deviation = 2.1) and 6.8 (standard deviation = 2.0) minutes ($p \leq 0.01$). We qualified six admissions made by nurses and 33 by assistants/technicians. The intervention spent 16.3% to 31.5% of the working hours of the team. **Conclusions:** admission impacts nursing workload and needs to be considered both in the measurement of activities and in the sizing of the nursing staff.

Descriptors: Workload; Process Assessment, Health Care; Time Management; Workflow; Nursing Human Resources.

RESUMO

Objetivos: mensurar o tempo médio despendido pela equipe de enfermagem durante a admissão de pacientes e investigar sua conformidade em relação às atividades descritas pela Classificação das Intervenções de Enfermagem; avaliar o grau de interferência sobre a carga de trabalho da equipe. **Métodos:** observacional com cronometragem de tempo por meio de um software. Acompanharam-se 199 admissões realizadas pela equipe de enfermagem em sete unidades utilizando-se dois instrumentos validados. Escores total $\geq 70\%$ e 50% qualificavam o processo. **Resultados:** o tempo médio dos enfermeiros variou de 5,5 (desvio padrão = 2,3) a 13 (desvio padrão = 1,1) minutos; e dos auxiliares/técnicos, entre 4,7 (desvio padrão = 2,1) e 6,8 (desvio padrão = 2,0) minutos ($p \leq 0,01$). Seis admissões realizadas por enfermeiros e 33 por auxiliares/técnicos mostraram-se qualificadas. A intervenção despendeu de 16,3% a 31,5% do tempo da jornada de trabalho da equipe. **Conclusões:** a admissão impacta a carga de trabalho e precisa ser considerada tanto na mensuração das atividades como no dimensionamento da equipe de enfermagem.

Descritores: Carga de Trabalho; Avaliação de Processos em Cuidados de Saúde; Gerenciamento do Tempo; Fluxo de Trabalho; Recursos Humanos de Enfermagem.

RESUMEN

Objetivos: mensurar el tiempo medio ha gastado por el equipo de enfermería durante la admisión de pacientes e investigar su conformidad en relación a las actividades descriptas por la Clasificación de las Intervenciones de Enfermería; evaluar el grado de interferencia sobre la carga de trabajo del equipo. **Métodos:** observacional con cronometraje de tiempo por medio de un software. Se acompañaron 199 admisiones realizadas por el equipo de enfermería en siete unidades utilizándose dos instrumentos validados. Apuntados el total $\geq 70\%$ y 50% calificaban el proceso. **Resultados:** el tiempo medio de los enfermeros varió de 5,5 (desviación típica = 2,3) a 13 (desviación típica = 1,1) minutos; y de los auxiliares/técnicos, entre 4,7 (desviación típica = 2,1) y 6,8 (desviación típica = 2,0) minutos ($p \leq 0,01$). Seis admisiones realizadas por enfermeros y 33 por auxiliares/técnicos se mostraron calificadas. La intervención ha gastado de 16,3% a 31,5% del tiempo de la jornada de trabajo del equipo. **Conclusiones:** la admisión impacta sobre la carga de trabajo y precisa ser considerada tanto en la medición de las actividades como en el dimensionamiento del equipo de enfermería.

Descriptorios: Carga de Trabajo; Evaluación de Procesos, Atención de Salud; Administración del Tiempo; Flujo de Trabajo; Recursos Humanos de Enfermería.

INTRODUCTION

One of the indicators considered in bed management is patient turnover. It can be described as the movement of patients in and out of the inpatient unit encompassing admission activities, transfers in and out of the unit, and discharge⁽¹⁻²⁾.

Occurring often during the day, in any work shift, this activity spends a significant working time of the nursing staff, making it difficult to deliver safe and quality care⁽²⁻³⁾. It is possible to define the nursing workload as the proportion of activity demanded by available staff resources, reflecting on quality issues and patient outcomes⁽⁴⁾. Patient turnover influences this overload due to physical and cognitive effort and can bring unsatisfactory results regarding work, the decline in communication, and team interaction⁽⁵⁻⁶⁾.

Compared to the discharge process, admissions require more time and intensity, considering the duration of data collection and physical examination activities. The range of time depends on the patient's condition, i.e., whether it is a scheduled or urgent admission. This fact directly impacts the nursing staff responsible for this activity⁽³⁾. Such a time demand, if high, can generate adverse events, especially during unscheduled admissions, often due to the professional's rush to perform the activity. There are reports on identification errors and incidents related to other patients who are momentarily unattended⁽⁵⁾.

The repercussion of movements directly affects the workload of the nursing staff and, therefore, the number of professionals needed to meet the care demands of patients^(5,7-8). The inadequate calculation of professionals, as it does not portray the real workload, thus acquires particular relevance. Besides reflecting on the results of patient care and safety, it generates a feeling of stress, dissatisfaction, and burnout in the team due to the inability to deliver the necessary care.

This research is an offshoot of the project "Workload dimensions: factors not related to Patient Care Complexity" (*As dimensões da carga de trabalho: fatores não relacionados à complexidade assistencial do paciente*), linked to the Health Services and Nursing Services research group (GESTSAÚDE). The research was conducted to measure the average time spent by the nursing staff during patient admission, investigate their compliance with the activities described by the Nursing Interventions Classification (NIC)⁽⁹⁾, and evaluate the degree of interference of this intervention in the workload of the team. This research proposes to answer the following questions: "What is the average time spent by the nursing staff to perform admission of patients in the units? Do the activities related to this intervention comply with those described by the NIC? How long does the nursing team require to perform the largest number of activities, qualifying these interventions? What is the influence of patient admission to the unit on the workload of the nursing staff? "

OBJECTIVES

To measure the average time spent by the nursing staff during patient admission and investigate their compliance with the activities described by the Nursing Interventions Classification; evaluate the degree of interference in the workload of the team.

METHODS

Ethical aspects

The Research Ethics Committee approved the study (under opinion 980.660/2015). It also received the endorsement of the Hospital Administrator and Nursing Manager of the investigated institutions and the acceptance of the participants by signing the Informed Consent Form (ICF).

Study Design, location, and period

The observational method⁽¹⁰⁾ was used to assess the frequency, average time spent, and quality of patient admissions to hospital units. To describe the impact on the nursing workload, we adopted the descriptive method. The investigation took place in four inpatient units (three surgical clinics and one medical-surgical) and three specialized units (adult intensive care, urgent and emergency care and maternal-infant care) of two hospitals in the state of São Paulo, Brazil, named Hospital 1 (H1) and Hospital 2 (H2).

The H1 has 198 beds and is a private, philanthropic, and teaching hospital. The H2 has 144 beds exclusively for hospitalization of SUS (Single Health System) patients and outpatient clinics. The choice of units met the criterion of higher patient turnover, i.e., a higher number of admissions.

Monthly, there are about 1,070 admissions to H1 and about 500 admissions to H2. These processes are formalized in Standard Operating Procedures (SOPs) and are used to guide nursing practice in both institutions. The activities performed by the team upon admission are complementary, considering the professional competences and the different perspectives of care.

Sample: inclusion and exclusion criteria

We defined the sample size considering the power of 80% and $p \leq 0.05$. Thus, 199 admissions (97 by nurses and 102 by assistants/technicians) were observed among the units studied, performed by 22 members of the nursing team from both institutions. During the day and night periods, professionals with work experience were accompanied over 90 days and who agreed to have their care activities observed and measured.

Study Protocol

We elaborated two instruments related to the admissions of the categories "nurses" and "nursing assistants/technicians", considering the complementarity of the actions involved in this activity. To characterize the participants, we used a questionnaire addressing aspects related to age, gender, length of work in the institution, work shift, and professional qualification.

Initially, a list of activities corresponding to the investigated intervention were made, in which we selected those pertinent to the national practice scenario based on the NIC⁽⁹⁾. Secondly, the Admission activities (NIC 7310) performed by nurses were grouped into six items: Service and Routine (Admit the patient by informing their role; Orienting on their rights and duties; Institution routines), Care (Orienting on care expectations; Obtaining

information about the caregiver), Facilities (Orienting about facilities; Orienting on Human Resources, Materials), Interview and Physical Examination (Obtain History, Pre-existing Diseases, Allergies; Perform Physical Examination; Conduct Psychosocial Investigation; Conduct Risk Investigation), Documentation (Develop Care Plan; Advise Multidisciplinary Team on the patient's condition, if needed) Patient Safety (Implement Safety Measures such as Patient Identification and Protocols; Obtain a Medical Prescription; Guide Safety Measures), totaling 16 sub-items/activities. For nursing assistants/technicians, we grouped the admission activities into five items: Service and Routine (Admit the patient; Orienting on rights and duties; Institution routines such as hygiene schedules), Care (Orienting on care expectations; Obtaining information about caregiver), Data Collection (Obtaining history of previous illnesses, medications, and allergies; Conduct religious data investigation), Documentation (Medical record keeping), and Patient Safety (Implement safety measures such as bed rails, intermittent mattress; Guide on safety measures), unfolding in 10 sub-items/activities.

The two instruments built were evaluated, regarding their content and representativeness in the practice context, by five doctor nurses and three clinical nurses. The level of agreement $\geq 80\%$ was adopted¹⁰; and the relevance, clarity, and objectivity criteria, 98%. Subsequently, the pretest in hospital units confirmed its adequacy. From then on, the procedures for data collection began - from July 2016 to February 2017 and supplemented from August to October 2018, to study the historical series of admissions.

After prior contact with the clinical nurses explaining the objectives of the study, all parts agreed that one of the researchers would be notified (by telephone) upon admission to the units investigated. Observation sessions were held from Monday to Friday, day and night, without interaction with the professionals under investigation except to clarify possible doubts regarding the execution of any activity that they were developing.

We perform time measurement of observed interventions using time tracking software⁽¹¹⁾, known as Toggl⁽¹²⁾. At the patient's admission, the researcher set the timer at the moment the professional entered the room to greet him, introducing himself; and with the medical record in hand, confirming the data along with the identification bracelet. Then, nursing professionals performed the activities (orientations, vital signs measuring, and notes taken) at the bedside; and the timing was interrupted with the completion of care and the professional leaving the room.

During the observational study, concomitantly with the time measurement, the researcher checked all activities listed in the admission instruments (16 for nurses and 10 for assistants) to verify their degree of compliance with the activities suggested by the NIC. Thus, when the professional performed one of the activities listed, it was marked.

Results analysis and statistics

We used for statistical testing the SAS System for Windows (Statistical Analysis System) software, version 9.2. SAS Institute Inc, 2002-2008, Cary, NC, USA. The significance level $p < 0.05$ was adopted. We presented the categorical variables as absolute, and percentage frequency; and numerical variables, with mean (M),

standard deviation (SD), minimum and maximum values, median (MD) and quartiles (Q1-Q3); The Chi-square test was applied to compare categorical variables; and, in the presence of expected values lower than 5, Fisher's exact test was used.

To compare the numerical variables between the two groups, the Mann-Whitney test was used. Among three or more groups, due to the absence of normal distribution of variables, the Kruskal-Wallis test was adopted. For significant differences, Dunn's multiple comparisons test.

To verify the quality of the admission process, initially, the limit of 70% in the total admission score (nurses, 11 to 16; assistants/technicians, 7 to 10) was considered. The reduced number of admissions made by assistants/technicians, with a total score of $\geq 70\%$, made statistical calculations difficult. Thus, to enable the measurement of time spent, we decided to reduce this limit to 50% (score 5 to 10).

For monthly measurement of the number of activities performed by unit, shift, and professional category, a historical series of three months in the units investigated was verified. We based the calculation of the percentage of time spent within the working hours on the hours worked per shift, excluding day and night working breaks, in which:

$$\text{Total time} = \frac{\text{admissions average time} \times \text{average number of admissions}}{\text{Category and unit}}$$

$$\text{Working hours (\%)} = \text{admissions average time converted in \%}$$

Considering 5.75 hours (345 minutes) really worked during the day; and 11 hours (660 minutes) at night.

RESULTS

We observed a total of 199 patient admission activities performed by the nursing staff (97 nurses [N] and 102 assistants/technicians [NA/NT]), performed predominantly by female professionals with an average age of 28.3 (SD = 6.4; NA/NT) and 30.1 years (SD = 3; N), and length of work in the institution ranging from 3.1 (SD = 1.6; NA/NT) to 6.4 (SD = 2.7; N). The highest percentage of admissions occurred in the surgical unit 1, 57.8% (n = 59; NA/NT); and in maternal infant care unit, 50.5% (n = 49; N), mostly in the morning - 69% (n = 67; N) and 46.1% (n = 47; NA/NT).

Among the admissions made by nurses (n = 97), the average time spent in the units ranged from 5.5 (SD = 2.3) to 13 (SD = 1.1) minutes ($p \leq 0.01$); and, in the observed shifts, from 7.2 (SD = 2.7) to 7.5 (SD = 3.2). Nursing assistants / technicians, on average, demanded between 4.7 (SD = 2.1) and 6.8 minutes (SD = 2.0) in the units investigated; and between shifts, the time ranged from 4.4 (SD = 2) to 6.1 minutes (SD = 2.4) ($p \leq 0.05$) (Table 1).

Considering the activities verified in the admissions made by nurses (n = 16) and by assistant/technician (n = 10) in accordance with the NIC, the total score showed, respectively, SD = 7 (Q1-Q3 = 6-9) and SD = 4 (Q1-Q3 = 4-5). The items most performed by nurses were: Service and routine (SD = 2; Q1-Q3 = 1-2), Security (SD = 2; Q1-Q3 = 1-2) and Interview/Physical Examination (SD = 2; Q1-Q3 = 2-3). And by the assistants/technicians were: Documentation (SD = 1; Q1-Q3 = 0-1), Interview/Physical Examination (SD = 1; Q1-Q3 = 1-1) and Security (SD = 1; Q1-Q3 = 1-1).

Table 1 - Average time spent (in minutes) by nurses and nursing assistants/technicians to perform admissions, Catanduva, São Paulo, Brazil, n = 199

| Variables | Nurses (n = 97) | | | Assistants / technicians (n = 102) | | |
|------------|-----------------|-----------|--------------------|------------------------------------|-----------|----------------------|
| | M(SD) | Variation | p value | M(SD) | Variation | p value |
| Units | | | | | | |
| Surgical 1 | 5.5 (2.3) | 2.4-9 | ≤ 0.01** | 5.8 (2.3) | 1.5-11.2 | Ns** |
| Surgical 2 | 8.4 (2.6) | 4.6-13 | | 6.8 (2) | 3.3-9.2 | |
| Surgical 3 | - | - | | 4.7 (2.1) | 2.3-9.7 | |
| MSU | - | - | (Surgical 1 ≠ ICU; | - | - | |
| MICU | 7.1 (3.4) | 2.2-16.4 | MCU ≠ ICU)*** | 5.8 (2.4) | 1.9-11.5 | |
| UEU | 8.5 (2.1) | 5.2-14.4 | | - | - | |
| ICU | 13 (1.1) | 12.2-13.8 | | - | - | |
| All Units | 7.4 (3.1) | 2.2-16.4 | | 5.7 (2.3) | 1.5-11.5 | |
| Shifts | | | | | | |
| Morning | 7.5 (3.2) | 2.2-16.4 | Ns* | 6.1 (2.4) | 1.9-11.5 | ≤ 0.05** |
| Afternoon | 7.2 (2.7) | 2.4-13.8 | | 5.7 (2.2) | 1.5-9.3 | |
| Night | - | - | | 4.4 (2) | 2.3-9.7 | (Morning ≠ Night)*** |

Note: M - mean SD - standard deviation; Ns - not significant; MSU - medical-surgical unit; MICU - maternal-infant care unit; UEU - urgent and emergency unit; ICU - intensive care unit; p value. *Mann Whitney test; **Kruskal-Wallis; ***Dunn posttest.

Table 2 - Frequency of attendance of the scores for each item verified in the admissions made by nurses and assistants/technicians, Catanduva, São Paulo, Brazil, n = 199

| Subitems | Serv/Rout (3/3)* N(%) | Care (2/2)* N(%) | Facility (2/0)* N(%) | In / PE (4/2)* N(%) | Documentation (2/1)* N(%) | Security (3/2)* N(%) |
|-----------------------|-----------------------|------------------|----------------------|---------------------|---------------------------|----------------------|
| Nurse (n = 97) | | | | | | |
| Did not perform | 4 (4.1) | 60 (61.8) | 57 (58.8) | - | 64 (66) | 1 (1) |
| 1 | 22 (22.7) | 28 (28.9) | 30 (30.9) | 4 (4.1) | 30 (30.9) | 36 (37.1) |
| 2 | 56 (57.7) | 9 (9.3) | 9 (9.3) | 59 (60.8) | 3 (3.1) | 54 (55.7) |
| 3 | 15 (15.5) | - | 1 (1) | 25 (25.8) | - | 6 (6.2) |
| 4 | - | - | - | 9 (9.3) | - | - |
| Assi / tech (N = 102) | | | | | | |
| Did not perform | 16 (15.7) | 67 (65.7) | - | - | 34 (33.3) | 19 (18.6) |
| 1 | 59 (57.8) | 33 (32.3) | - | 87 (85.3) | 68 (66.7) | 66 (64.7) |
| 2 | 27 (26.5) | 2 (2) | - | 15 (14.7) | - | 17 (16.7) |

Note: Serv - service; Rout - routine; In - interview; PE - physical examination; Assi/tech - assistant/technician; * Score available on each item for nurses / assistants and technicians.

Table 3 - Average / month distribution of nursing staff admissions by unit and shift, from August to October 2018; and mean time (in minutes) according to section in the score by 50% and 70%, Catanduva, São Paulo, Brazil, 2018, N = 1,475

| Variables | Nurses (n = 514) M(SD) | Assistants / technicians (n = 961) M(SD) |
|----------------------|------------------------|--|
| Units | | |
| Surgical 1 | 81 (18.7) | 165 (26.8) |
| Surgical 2 | 80 (10) | 85 (14.4) |
| Surgical 3 | 26 (18) | 120 (3) |
| Medical-surgical | 78 (3) | 92 (7) |
| Maternal infant care | 106 (10) | 113 (6) |
| Urgent and emergency | 86 (26) | 323 (33) |
| Intensive-care unit | 57 (10) | 63 (10.3) |
| Shifts | | |
| Morning | 205 (24.5) | 284 (11) |
| Afternoon | 159 (36.2) | 294 (18.5) |
| Night | 150 (25.2) | 383 (36.2) |
| Score | | |
| ≥ 5 | - | 5.2 (2.5) |
| ≥ 11 | 14.3 (1.6) | - |

Note: M - mean; SD - standard deviation.

In the admissions observed, it was found that the activities provided for in the item Documentation were not performed by 66% of nurses (n = 64) and 33% of assistants/technicians (n = 34); and those related to Care were also omitted by 61.8% (n = 60) of nurses and 65.7% (n = 67) of assistants/technicians. The questions regarding the Facilities, listed only for nurses, were not performed in 58.8% of admissions (Table 2).

In the investigation of the admission activities (according to the NIC) performed by nurses (n = 97), in a 70% section in the total score, only six admissions occurred in this interval (≥ 11 activities) and required time ≥ 9 minutes. For assistants/technicians (n = 102), only two admissions attended 70% of the observed activities; therefore, to enable time measurement, a section of 50% was admitted. Thus, 33 admissions were considered qualified, and most of them (n = 12) occurred in time ≤ 4 minutes.

Table 4 - Average total time (minutes) and percentage of daily working hours dedicated to nursing staff admissions by unit, shift, and the second section in the score by 50% and 70%, Catanduva, São Paulo, Brazil, 2018, N = 199

| Variables | Nurses (n = 97) | | Assistants / technicians (n = 102) | | Nursing staff (N = 199) | |
|----------------------|-----------------|-------------|------------------------------------|-------------|-------------------------|-------------|
| | Time Total* | Workday (%) | Time Total | Workday (%) | Time Total | Workday (%) |
| Units | | | | | | |
| Surgical 1 | 14.8 | - | 31.9 | - | 46.7 | - |
| Surgical 2 | 22.4 | - | 19.3 | - | 41.7 | - |
| Surgical 3 | - | - | 18.8 | - | 18.8 | - |
| Medical surgical | - | - | - | - | - | - |
| Maternal infant care | 25.1 | - | 21.8 | - | 46.9 | - |
| Urgent and emergency | 24.3 | - | - | - | - | - |
| Intensive-care unit | 24.7 | - | - | - | 24.7 | - |
| All Units | 126.8 | | 182.6 | | 309.4 | |
| Shifts | | | | | | |
| Morning | 51.2 | 14.8 | 57.7 | 16.7 | 108.9 | 31.5 |
| Afternoon | 38.2 | 11.1 | 55.9 | 16.2 | 94.1 | 27.3 |
| Night | - | - | 56.2 | 16.3 | 56.2 | 16.3 |
| Score | | | | | | |
| ≥ 5 | - | - | 166.6 | - | - | - |
| ≥ 11 | 245.0 | - | - | - | - | - |

Between August and October 2018, the nursing staff made an average of 1,475 admissions to the units studied, of which 514 (SD = 85.4), performed by nurses, and 961 (SD = 43.5), by assistants/technicians. The average number of admissions made by the nursing staff ranged from 26 (SD = 18) to 323 (SD = 33) between the units and from 150 (SD = 25.2) to 383 (SD = 36.2) in shifts. The average time to perform the largest number of activities was 14.3 minutes (SD = 1.6) for nurses and 5.2 minutes (SD = 2.5) for assistants/technicians, as shown in Table 3.

Regarding the average time devoted to admissions by the nursing staff, there was a variation from 18.8 (surgical 3) to 46.9 (maternal-infant care) minutes. The daily percentage spent on working hours for the activity ranged from 16.3% (night) to 31.5% (morning). To contemplate ≥ 11 score items, the nurses spent a total of 245 minutes, and the assistants/technicians, to reach ≥ 5 , dedicated a total time of 166.6 minutes (Table 4).

DISCUSSION

This study evaluated the time and quality of patient admissions performed in hospital units without pretending to standardize time for this intervention, but rather to look more closely at its influence on the nursing workload.

In the institutions studied, we identified the average time of 7.4 minutes for patient admissions by nurses; and 5.7 minutes by nursing assistants and technicians - totaling 13.1 minutes for the team. It is worth mentioning the complementarity in the actions developed by these professionals. Even when the assistants/technicians performed the admission, the nurse, as team coordinator, participated in the patient's reception, identifying care needs to systematize nursing care.

The activities performed during admissions require both physical and mental effort. Therefore, they are considered time-consuming and intense⁽⁵⁾ and have been associated with workload⁽³⁾. Some studies⁽¹³⁻¹⁴⁾ relate the time consumed to the discharge process and documentation, making impossible an exact comparison with the time observed in this investigation. There are also estimates of nurses' time from data generated through participant observation and interviews at US medical and surgical units⁽⁵⁾ of approximately one hour for a patient in need of minimal care. According to NIC⁽⁹⁾, considered a reference for professional practice, patient admission may require 16 to 30 minutes.

Regarding the units, the time consumption was higher in intensive care (13 minutes - nurses) and surgical unit 2 (6.8 minutes - assistants/technicians). The increased degree of complexity and the level of attention required in ICUs influence the increased demand for care time⁽¹⁵⁾ as the patient can change their condition quickly and unpredictably⁽¹⁶⁾. In surgical unit 2, the profile of post-trauma patients with orthopedic comorbidities from the emergency room, often with surgical devices such as external bone fixators and situations of physical immobility, requires careful initial evaluation, which reflects on the time.

When examining the compliance of admissions with the activities described in the NIC, it is possible to observe that nurses attended 43.7% (7/16) and assistants and technicians 40% (4/10) of the verification list items. This factor is worrying, as it signals a poor quality of this intervention by the team. The moment

of admission is crucial for the identification of professionals, assessment of patients' needs, guidance, and planning of care actions⁽¹⁷⁾. Proper registration of these activities also subsidizes the care continuity. However, due to the workload of the nursing staff, this intervention is often compromised, and other times is not prioritized in educational processes⁽¹⁸⁻¹⁹⁾.

The provision of evidence-based care is based on protocols and procedures described to guide professional practice, and the health team should continually discuss it, considering the updating and qualification of the work performed⁽²⁰⁾. In the institutions studied, these instruments are present and, in the case of admission, it was observed that two items (orientation on rights and duties of the patient/family/important people; and communication of the multidisciplinary team about the admitted patient's condition) were not included in the reference document for the team and the researcher listed and checked them. Therefore, the professionals may not have attended these activities considered from the NIC because they are not contemplated, yet, in the patient's admission by the nursing staff of these hospitals.

In this study, nurses seem to be more concerned with guidance on safety routines and institutional protocols, as well as interviewing and physical examination. On the other hand, they neglected items such as documentation (66%), care (61.8%), and facilities (58.8%). Information adequately registered in the medical record becomes a valuable document for the patient, health team and institution⁽¹⁸⁾, providing legal support, and ensuring effective communication between professionals and, thus, safety⁽²¹⁻²²⁾. In the city of Recife, in a private hospital accredited by the Joint Commission, there was a study that reviewed medical records for verification of nursing records; and, upon admission, there was higher non-compliance with physical examination and pain notes (44%)⁽²¹⁾.

In the item "care," we verified orientation activities regarding patient/family expectations and preparation for hospital discharge. The studied institutions adopt the process of planning and transferring care from one health unit to another, but research corroborates that the participation of the patient/family in the admission and discharge plan constitutes a weakness in the nurse's performance⁽²³⁻²⁴⁾. Professional time constraints and patients' clinical conditions and preferences (e.g., not participating) may prevent patient and family from being included in care decisions⁽²³⁾.

The average time demanded by nurses on admissions increased from 7.4 to 14.3 minutes, considering the qualification of this process when performing a higher number of activities (score ≥ 11), which represents a percentage increase of 93.2%. As for the assistants and technicians, it fell 8.8%, i.e., from 5.7 to 5.2 minutes (score ≥ 5). Adding these values, the nursing staff increased the time dedicated to admissions by 48.8% (from 13.1 to 19.5 minutes), approaching the time reported by the NIC⁽⁹⁾.

These findings show that to perform a more elaborate admission in line with the items described in the NIC, the nurses and staff have a more significant time consumption. However, only 6.2% (6/97) of nurses reached the proposed section value. It is important to note that a reduction of 50% of the total score was necessary considering the reduced number of qualified admissions ($\geq 70\%$ of the activities attended), in order to obtain 32.3%

(33/102) compliance of nursing assistants and technicians. The need for this reduction evidenced significant weakness in this process and the relevance of staff awareness and supervision to qualify patient admissions.

From a historical series of 1,475 admissions, it was possible to calculate the average time spent in this intervention, per unit and shift, and thus determine its influence on the nursing workload. In this series, there was a significant mean variation in admission movement (26-323) between units, reflecting the average time devoted by the nursing staff (18.8 to 46.9 minutes). It is noteworthy that, in some units, there were no admissions of some categories during this period, which may justify the small numerical value found.

The admissions represented time consumption ranging from 16.3% (night) to 31.5% (morning) of the working hours. Studies report commitment in the emergency unit of 7.4% of nurses' working hours⁽²⁵⁾. The work dynamics of the morning shift show a higher concentration of professional nursing activities, with follow-up visits and medical procedures, compared to other shifts⁽²⁶⁾. As a result, a high number of admissions can significantly overload the staff.

In the current work dynamics, in which the nursing team ends up being the main element in care, management, and process control, this additional burden generates a negative burden on professionals⁽⁸⁾. The primary indicator of a unit in which staff remains overworked and poorly sized are adverse events. These events allow measuring the distance between the care provided and the ideal care, enabling the construction of a safer health system⁽²⁷⁾.

Care discontinuity - which can be generated by patient turnover, change of location or staff, and vulnerability to which other patients are exposed - ultimately has a negative effect on the workplace⁽²⁾. In addition to the undesirable consequences for patients, it may also reflect in the burnoutsyndrome⁽²⁸⁾.

Thus, patient movement, and specifically, admissions need to be considered as one of the determining factors for nursing staff sizing and distribution of work shifts⁽³⁾. This attention would result in better performance of clinical and managerial activities, enabling higher quality and safety in the care delivery.

Study Limitations

Although research using structured observational methods for data collection allows a deeper understanding of social interactions and interventions in clinical nursing practice, it is

also necessary to recognize some of its restrictive issues. Among them, we highlight the observer's effect on the observed people, leading them to change their behavior.

It was not possible to measure the time required by the team following the items described in the NIC, considering the 70% section and the simultaneous activities performed by nurses and assistants/technicians during admission.

Still, the findings regarding the quality and time demanded by patient admissions in the two investigated institutions may differ from other practice contexts due to the different cultures and institutional work dynamics.

Contributions to nursing, health, or public policy

In addition to pointing out critical activities in the patient admission and intra-hospital transfer, this study demonstrates that the qualification of these interventions demands more time from the nursing staff, which impacts the workload. As care coordinators, nurses need to analyze patient turnover as a generator of staff overload and a risk factor for sentinel events and care discontinuity. The findings, therefore, make it possible for clinical nurses and managers to redesign and improve processes, as well as to forecast, provide and allocate staff, also considering the flow of patients in units and work shifts. It can also support other researches and policy discussions related to nursing sizing in hospital care.

CONCLUSIONS

The quality of the admission process is also a factor of concern in clinical practice. The time devoted by the nursing team in this intervention impacts the workload of the team, especially when they performed it according to the best professional evidence. This process, representative of patient turnover, needs to be considered in the measurement of nursing activities for the sizing and distribution of personnel in different units and work shifts. It should also be improved considering quality aiming for the continuity of care.

ACKNOWLEDGMENTS

To the research group Health Services and Nursing Services research group (GESTSAÚDE) of the *Faculdade de Medicina São José do Rio Preto* (Medical School), São José do Rio Preto, SP, Brazil.

REFERENCES

1. Park SH, Blegen MA, Spetz J, Chapman SA, Groot HD. Patient turnover and the relationship between nurse staffing and patient outcomes. *Res Nurs Health*. 2012;35(1):277-88. doi: 10.1002/nur.21474
2. Vanfosson CA, Yoder LH, Jones TR. Patient turnover: a concept analysis. *Adv Nurs Sci*. 2017;40(3):300-12. doi: 10.1097/ANS.000000000000171
3. Park SH, Weaver L, Johnson LM, Vukas R, Zimmerman J. An integrative literature review of patient turnover in inpatient hospital settings. *West J Nurs Res*. 2016;38(5):629-55. doi: 10.1177/0193945915616811
4. Alghamdi MG. Nursing workload: a concept analysis. *J Nurs Manag*. 2016;24(4):449-57. doi: 10.1111/jonm.12354
5. Jennings BM, Sandelowski M, Higgies MK. Turning over patient turnover: an ethnographic study of admissions, discharges, and transfers. *Res Nurs Health*. 2013;36:554-566. doi: 10.1002/nur.21565

6. Blay N, Duffield CM, Gallagher R, Roche M. A systematic review of time studies to assess the impact of patient transfers on nurse workload. *Int J Nurs Pract*. 2014;20:662–73. doi: 10.1111/ijn.12290
7. Blay N, Duffield CM, Gallagher R. Patient transfers in Australia: implications for nursing workload and patient outcomes. *J Nurs Manag*. 2012;20(1):302-10. doi: 10.1111/j.1365-2834.2011.01279.x
8. Hughes RG, Bobay KL, Jolly NA, Suby C. Comparison of nurse staffing based on changes in unit-level workload associated with patient churn. *J Nurs Manag*. 2015;23(3):390–400. doi: 10.1111/jonm.12147
9. Bulechek GM, Butcher HK, Dochterman JM, Wagner CM. *Classificação das Intervenções de Enfermagem-NIC*, tradução 6 ed., 2016.
10. Polit DF, Beck CT. *Fundamentos de pesquisa em enfermagem: avaliação de evidências para a prática da enfermagem*. 7ed. Porto Alegre: Artmed, 2011. 670p.
11. Catipon JB, Infante EJT. Time tracking technology [Internet]. 2012 [cited 2018 Feb 26]. Available from: <http://www.google.com/patents/US20120065932>
12. Toggl- Insanely simple time tracking [Internet]. [cited 2016 Feb 26]. Available from: <https://www.toggl.com/>
13. Moreno FN, Haddad MCL, Vannuchi MTO, Jenal S, Girotti SKO. Measuring nurses work in a philanthropic tertiary hospital. *Cogitare Enferm*. 2012;17(1):50-6. Available from: <https://pesquisa.bvsalud.org/portal/resource/pt/lil-693694>
14. Silva JA, Grossi ACM, Haddad MCL, Marcon SS. Quality assessment of nursing records in a semi-intensive care unit. *Esc Anna Nery*. 2012;16(3):576-81. doi: 10.1590/S1414-81452012000300021
15. Inoue KC, Kuroda CM, Matsuda LM. Nursing active scores (NAS): carga de trabalho de enfermagem em UTI e fatores associados. *Cienc Cuid Saude*. 2011;10(1):134-40. doi: 10.4025/ciencucidsaude.v10i1.14915
16. Douglas S, Cartmill R, Brown R, Hoonakker P, Slagle J, van Royet KS, et al. The work of adult and pediatric intensive care unit nurses. *Nurs Res*. 2013;62(1):50–8. doi: 10.1097/NNR.0b013e318270714b
17. Barral LNM, Ramos LH, Vieira MA, Dias OV, Souza LPS. Analysis of nursing notes on patients' medical records in a teaching hospital. *Rev Min Enferm*[Internet]. 2012 [cited 2018 Aug 14];16(2):188-93. Available from: www.reme.org.br/exportar-pdf/518/v16n2a06.pdf
18. Françolin L, Brito MFP, Gabriel CS, Monteiro TM, Bernardes A. Quality of nursing records in charts of hospitalized patients. *Rev Enferm UERJ* [Internet] 2012[cited 2018 Aug 23];20(1):79-83. Available from: <https://pesquisa.bvsalud.org/portal/resource/pt/int-2994>
19. Lima AFC, Ortiz DR. Direct cost of development and documentation of the nursing process. *Rev Bras Enferm*. 2015;68(3):683-9 doi: 10.1590/0034-7167.2015680416i
20. Fassini P, Hahn G V; Risk management in hospital unit: conceptions for nursing staff. *Rev Enferm UFSM* [Internet] 2012[cited 2018 Jul 27];2(2):290-9. Available from: <https://periodicos.ufsm.br/reufsm/article/download/4966/3753>
21. Moraes CGX, Batista EMS, Castro JFL, Assunção SS, Castro GMO. Nursing case files and the ir implications for quality of care according to hospital accreditation standards: a new perspective of the audit. *Rev ACRED*[Internet] 2015 [cited 2018 Pct 27];5(9):2237-5643, Available from: <https://dialnet.unirioja.es/servlet/articulo?codigo=5626617>
22. Viana CD, Bragas LZT, Lazzari DD, Garcia CTF, Moura GMS. Implementation of concurrent nursing audit: na experience report. *Texto Contexto Enferm*, 2016;25(1):e3250014. doi: 10.1590/0104-070720160003250014
23. Dyrsted DN, Laugaland KA, Storn M. An observation al study of old er patients' participation in hospital admission and discharge: exploring patient and next of kin perspectives. *J Clin Nurs*. 2015;24:1693–706. doi: <https://doi.org/10.1111/jocn.12773>
24. Martins KP, Costa KNFM, Oliveira DST et al. Nurse's role on preparing for discharge of surgical patients. *Rev Pesqui: Cuid Fundam*. 2015.7(1):1756-64. doi: 10.9789/2175-5361.2015.v7i1.1756-1764
25. Garcia EA, Fugulin FMT. Nurses work time distribution at emergency service. *Rev Esc Enferm USP*. 2010;44(4):1032-8. doi: 10.1590/S0080-62342010000400025
26. Alves CA, Deslandes SF, Mitre RMA. The management of nursing work in a pediatric ward of medium and high complexity: a discussion about co-management and humanization. *Interface Comunic, Saúde, Educ*. 2011;15(37):351-61. doi: 10.1590/S1414-32832011005000008
27. Gonçalves LA, Andolhe R, Oliveira EM, Barbosa RL, Mancussi e Faro AC, Gallottiet RM, et al. Nursing al location and adverse events/incidents in intensive care units. *Rev Esc Enfermagem USP* 2012;46(ESP):71-7. doi: <http://dx.doi.org/10.1590/S0080-62342012000700011>
28. Nogueira LS, Sousa RMC, Guedes ES, Santos MA, Turrini RNT, Cruz DALM. Burnout and nursing work environment in public health institutions. *Rev Bras Enferm*. 2018;71(2):336-42. doi: 10.1590/0034-7167-2016-0524