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RESEARCH PAPER (ORIGINAL)

Emergency room approach: safe nursing staffing

Abordagem na sala de emergência: dotação adequada de recursos de enfermagem

Enfoque en la sala de urgencias: dotación adecuada de los recursos de enfermería

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Abstract

Background: The prognosis of the critically ill person in the emergency room depends on the effective performance of the health team in operation.
Objectives: To understand and justify the need to allocate a nurse who works exclusively in the assistance to patients in the emergency room of a hospital in the Great Lisbon and Tagus Valley region with multipurpose emergency service.
Methodology: Retrospective, descriptive, exploratory, and quantitative study, with a sample of 3185 critically ill patients. Data collection through observation grid. Statistical analysis was performed using the IBM SPSS Statistics software, version 25.0. The Kruskal-Wallis test and chi-square test were used.
Results: In 2017, an average of 9 patients per day were admitted in the emergency room. The direct care delivered lasted, on average, 45.4 minutes, 65% were admitted to the surgical admission unit service or the area of clinical observation of the emergency department.
Conclusion: It is crucial to ensure safe staffing in care delivery to the critically ill person, being necessary a nurse working exclusively in the emergency room.

Keyowrds: emergency; emergency room; nursing; safe staffing

Resumo

Enquadramento: O prognóstico da pessoa em situação crítica na sala de emergência depende da eficácia da atuação da equipa que a assiste.
Objetivos: Perceber e justificar a necessidade de alocar um enfermeiro que tenha como função a abordagem em exclusivo a clientes da sala de emergência num hospital da região de Lisboa e Vale do Tejo com um serviço de urgência polivalente.
Metodologia: Estudo retrospetivo, descritivo, exploratório, quantitativo. 3185 clientes críticos, recolha de informação por grelha de observação. Análise estatística foi realizada com o *software* IBM SPSS Statistics, versão 25.0. Recorreu-se ao teste de Kruskal-Wallis e Qui-quadrado.
Resultados: No ano de 2017, na sala de emergência admitiram-se em média 9 clientes por dia, os cuidados diretos prestados exigiram em média 45,4 minutos, 65% foram admitidos na unidade de internamento médico-cirúrgico do serviço de urgência ou na área de observação clínica do mesmo serviço.
Conclusão: Emerge a necessidade de garantir dotação adequada aquando da prestação de cuidados à pessoa em situação crítica, sendo necessário um enfermeiro para funções exclusivas à sala de emergência.

Palavras-chave: emergência; sala de emergência; enfermagem; dotação segura

Resumen

Marco contextual: El pronóstico de la persona en una situación crítica en la sala de urgencias depende de la eficacia del equipo que la asiste.
Objetivos: Comprender y justificar la necesidad de asignar un enfermero cuya función sea atender exclusivamente a los pacientes de la sala de urgencias de un hospital de la región de Lisboa y Valle del Tajo con un servicio de urgencias polivalente.
Metodología: Estudio retrospectivo, descriptivo, exploratorio y cuantitativo. 3185 pacientes críticos, recopilación de información mediante una parilla de observación. El análisis estadístico se realizó con el programa IBM SPSS Statistics, versión 25.0. Se utilizó la prueba de Kruskal-Wallis y la de ji al cuadrado.
Resultados: En 2017, se admitió una media de 9 pacientes por día en la sala de urgencias, la atención directa prestada exigió un promedio de 45,4 minutos, el 65% fue admitido en la unidad de internamiento médico-quirúrgico del servicio de urgencias o en el área de observación clínica del mismo servicio.
Conclusión: Es necesario garantizar una dotación adecuada cuando se atiende a la persona en una situación crítica, y es necesario un enfermero para las funciones exclusivas de la sala de urgencias.

Palabras clave: emergencia; sala de emergencia; enfermería; dotación segura

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Introduction

It is difficult to specify the care delivered in the emergency room. In Portugal, there are no specific figures of safe staffing for nursing in the emergency room, nor standardization on the need for exclusive service of nurses in these units. Considering the number of daily admissions, the length of stay of the patient in the emergency room, the care demands, and the physical and psychological fatigue resulting from clinical nursing practice, it is understood that it is necessary to allocate a nurse to perform functions to the emergency room exclusively.

Within the scope of literature review, the Standards Manual - Urgency and Emergency Units of the Portuguese Directorate General of Health (Direção-Geral da Saúde [DGS], 2016) states that there should be a definition and distribution of responsibilities for each job, as an essential support tool for better and more efficient development of the functions and activities of health professionals.

In this sense, it is important to understand and justify the need to allocate a nurse for exclusive service in the emergency room at a hospital in the Great Lisbon and Tagus Valley region with polyvalent emergency service.

Background

Health care in emergencies is a vital component to the society of today. There is an increasing need for this type of care due to accidents, urban violence, and illnesses related to lifestyle, aging of the population, and subsequent co-morbidities.

According to the DGS, the purpose of the emergency department (ED) is to "treat patients in urgent and emergencies, offering effective, efficient, and equal treatment" (2001, p. 6-7). To clarify the logic operation of the ED, the same entity defined the concepts of an urgent situation as "all clinical situations of sudden onset, from mild to severe, with the risk of vital organ failure" (DGS, 2001, p. 32) and emergency as "all clinical situations of sudden onset with established or imminent vital organ compromise" (DGS, 2001, p. 32). In addition, according to the Handbook of Technical Guidelines in Emergencies, published by the Portuguese Health System Central Administration (Administração Central do Sistema de Saúde, 2015), this type of service aims at admitting, diagnosing, and treating injured patients or with sudden illness who need immediate care in hospital settings. Thus, people who use this type of service is assisted by a multidisciplinary team with specific training and skills (Fernandes, Branco, & Rodrigues, 2019).

According to DGS (2001), the emergency room aims at admitting patients with a high risk of death. To Aehlert (2007), care delivery in this context should seek out a fast recovery of lung and circulatory viability, while preserving the vital organs. In this sense, nursing care to this type of patient is highly specialized, focusing on the prevention of complications and minimization of disability.

After stabilization in the emergency room, the patient is transferred to the place previously determined, ensuring the safety and benefits of the patient. The health team assisting the critically ill person is in charge from the moment the patient is admitted to the emergency room until he or she leaves either to a service within the health care unit or to another health unit (Massada, 2002).

Many health professionals work in an ED, being that the nurses constitute the largest part of the teams. However, nowadays, the lack of financial resources in health care institutions results in the absence of these professionals, reflecting on the quality of care provided to the population (Paixão, Campanharo, Lopes, Okuno, & Batista, 2015). The ED is the face and the point of entry of a hospital, characterized as a stressful and unpredictable environment, lacking care standardization, in which actions are time-dependent, fast-paced. Every minute counts, hence the need for a very well prepared and knowledgeable health team, with technical and psychomotor skills in decision-making and fast teamwork planning.

Critical care delivery requires complex and timely interventions, including in the extra-hospital area, from primary transport to intra-hospital assistance (Ferreira et al., 2008). So that patients referred to the ED can receive adequate care, it is necessary to equip these health units with professionals who serve this purpose. Staffing is defined as "the numbers and kinds of personnel required to provide care to the patient or client" (Hall, 2005, p. 11).

Safe nursing staffing means the correct allocation of nurses in quantity and quality, considering the needs of patients, being a necessary condition for the quality of care provided. In fact, the availability of adequate resources is fundamental for safe practices and ensuring adequate assistance to people, as well as their safety and satisfaction (Freitas & Parreira, 2013), hence the need to assess whether this hospital needs the allocation of a nurse for exclusive service in the emergency room.

The need for adequate nursing resources, considering safety, level of need for nursing care, quality of nursing care, workload, work environment, and level of qualification/expertise of nurses, created the concept of safe nursing staffing (Freitas & Parreira, 2013). The standard for calculating safe nursing staffing in the ED uses the formula per workplace adapted to the case flow and demand flows according to the time of day, the day of the week, the month (Ordem dos Enfermeiros, 2014). In this formula, the minimum benchmark for the hours of necessary care is the value of intermediate care units, making no specific mention of the nursing work in the emergency room.

Research Question

How many critically ill patients were admitted to the emergency room of a polyvalent emergency service in 2017? How much time was required for each patient, and what was the reason for admission? In which shift was there a higher patient turnout? What was the destination of the patient?

Methodology

These questions are guidelines to understand the need to allocate a nurse for exclusive service to patients in the

emergency room at a hospital in the Great Lisbon and Tagus Valley region with polyvalent emergency service. In the clinical context where the study was conducted, there is no nurse assigned exclusively to the emergency room on a daily basis, but there are nurses allocated to other workplaces whose functions include also support to the emergency room.

A descriptive, exploratory, retrospective, quantitative study was conducted in a general emergency service (GES) of a hospital in the Great Lisbon and Tagus Valley region, categorized by the Hospital Emergency Referral Network as a polyvalent emergency service (PES).

This study included all patients who were admitted to the emergency room of this hospital from 1 January 2017 until 31 December 2017, obtaining a total of 3185 patients with complete information at the level of the records consulted (N = 3185). The emergency room of this hospital admits patients coming directly from outside (home, the street, etc.), while others come from other hospitals or are waiting for medical observation, or have already been observed and, for some reason, their state of health has worsened, requiring care that should be provided in this setting.

The GES had, on average, a daily turnout of 274 patients in 2017. In this service, jobs are divided by area of care: triage, emergency room, outpatient, clinical observation, green and blue emergency service, and surgical admission unit of GES (SAU). There is also a nurse responsible for informing and assisting the patient/family of the patient that uses this ED during the morning or afternoon period. The ratio of nurses working in direct contact with the patient is 14 in the morning shift, 14 in the afternoon shift, and 10 in the night shift. There are, besides the head nurse of the shift team, two more nurses allocated to the emergency room (depending on the consideration of the head nurse) that are distributed, usually, in triage, outpatient clinic, or clinical observation.

The group of nurses responsible for monitoring the emergency room has a database which records all admissions made in this room. This platform was accessed to consult and transcribe into a grid all the relevant information to try to answer the research questions of this study: number of admissions in the emergency room, shift of occurrence, reason for admission, length of stay, and destination of the patient. It should be emphasized that the reasons for admission in the emergency room were recorded based on the flowcharts of the Manchester Triage System, the *vias verdes* (from an external referral or activated in the GES), electrocardiographic changes observed, and other more specific reasons, such as patients who came under the Lisbon Metropolitan Emergency program or those who come in already dead. This grid of records was built by researchers of this study, based on the institutional record model, having been critically analyzed by experts in the area of care to the critically ill patient.

The ethical procedures were respected. Authorization was requested from the Clinical Coordinator and the head nurse of the General Emergency Service, as well as the Board of Directors. This study was subject to the opinion of the Ethics Committee of the hospital (order no. 16/10/2018). It should be noted that the patients' rights were safeguarded in the whole process of this study, since no elements that would identify the patient were used.

The data were organized, and the statistical analysis was performed with the IBM SPSS Statistics software, version 25.

In the global characterization of the sample, the numerical variables, due to their asymmetric distributions, were summarized by median and percentiles 25 and 75 and are presented in the text through the acronyms Md, P_{25}, and P_{75}, respectively. The qualitative variables were summarized by the absolute and relative frequencies. For the assessment of the relationships between the abovementioned variables, the Kruskal-Wallis test (e.g., comparison of the patient's length of stay in the emergency room between three groups of subjects; e.g., admissions in the morning, afternoon, and night shifts) and chi-square test (e.g., the relationship between shift and reason for admission). All the p values of the tests were considered statistically significant if they were less than 0.05.

Results

The results of descriptive analysis and, subsequently, bivariate analysis are presented to respond to the objective of this study.

Characterization of the sample

In 2017, 3185 patients were admitted to the emergency room of the GES, being that 1705 (53.5%) were male and the remaining female. Assuming that 2017 was 365 days, the daily average was 8.7 admissions. Patients admitted to the emergency room were mainly elderly, with a median of 74 years of age.

Frequency of admissions

As regards the frequency of hospital admissions in the emergency room, per shift, there was a higher percentage of admissions in the morning shift ($p < 0.001$), approximately 40.4%, and a lower percentage in the night shift, 25.5% (Table 1).

Table 1
Admissions of patients, per shift, in the emergency room of a hospital in the Great Lisbon and Tagus Valley region in 2017 (N = 3185)

Shift	Number of admissions	Mean
Morning	1286	40.4%
Afternoon	1087	34.1%
Night	812	25.5%
Total	3185	100%

It was still possible to ascertain that there were more admissions in the autumn and winter months (55.5%) than in the spring and summer months (44.5%) with a *p*-value of < 0.001.

Length of stay
The average duration of 3185 emergency episodes was 45 minutes and 40 seconds, but more than half of these were shorter (Fashion = 30›).
As shown in Table 2, more than four-fifths of the subjects (81.1%) remained one hour or less in the emergency room (18.9% remained over one hour).

Table 2
Length of stay in the emergency room of a hospital in the Great Lisbon and Tagus Valley region in 2017 (N = 3185)

Time	Number of admissions	Mean
Up to 30 min.	1188	37.3%
31 to 60 min.	1394	43.8%
More than 1 hour	603	18.9%
Total	3185	100%

As presented in Table 3, although more patients were admitted in the morning shift, their permanence in the emergency room during the morning shift is significantly lower (35 minutes) than in the afternoon and night shifts (40 minutes; *p-value* = 0.001 in the Kruskal-Wallis test).

Table 3
Length of stay, per shift, of the patients in the emergency room of a hospital in the Great Lisbon and Tagus Valley region in 2017 (N = 3185)

Shift	Number of admissions	Mean	Median
Morning	1286	43.65	35.00
Afternoon	1087	47.77	40.00
Night	812	44.99	40.00
Total	3185	45.47	40.00

Considering the average duration of assistance to each patient in the emergency room and the number of admissions, it was found that, in every shift, exclusive assistance to patients in the emergency room requires between 1,7 and 2,6 hours (Table 4).

Table 4
Duration of assistance to patients in the emergency room of a hospital in the Great Lisbon and Tagus Valley region in 2017 (N = 3185)

Shift	Mean duration of episodes in each admission (min.)	Number of admissions	Total duration of emergency episodes (h/day)
Morning	43.65	1286	2.6
Afternoon	47.77	1087	2.4
Night	44.99	812	1.7
Total	45.40	3185	6.6

Reason for admission
It was essential to establish the reason for the admission of patients. Thus, the two most important reasons for admission to the emergency room were dyspnea and electrocardiographic changes (Table 5).

Table 5
Reason for admission of patients in the emergency room of a hospital in the Great Lisbon and Tagus Valley region in 2017 (N = 3185)

Reason for admission	Number of admissions	Mean
Dyspnea	699	21,9
Electrocardiographic changes	652	20,5
Via Verde do AVC	266	8,4
Altered state of consciousness	221	6,9
Convulsion	168	5,3
Thoracic pain	156	4,9
Cardiorespiratory arrest	154	4,8
Via Verde Coronária	137	4,3
Severe trauma	128	4,0
Unconsciousness/Fainting	84	2,6
Via Verde da Sépsis	70	2,2
Intracranial hemorrhage	55	1,7
Gastrointestinal bleeding	53	1,7
Abdominal pain	52	1,6
Heart palpitations	42	1,3
Overdose and poisoning	37	1,2
Other	211	6,7
Total	3185	100,0

Note. Via Verde do AVC = Code stroke protocol; Via Verde Coronária = Code coronary protocol; Via Verde Sépsis = Code sepsis protocol.

Concerning the destination of patients assisted in the emergency room, it is noted that the more significant part was admitted to the SAU or referred to the area of clinical observation (Table 6).

Table 6
Destination of the patients assisted in the emergency room of a hospital in the Great Lisbon and Tagus Valley region in 2017 (N = 3185)

Destination	Number of admissions	Mean
Surgical Admission Unit	1178	37.0
Clinical Observation	893	28.0
Intensive Care Unit	264	8.3
Hemodynamics Room	159	5.0
Morgue	146	4.6
Outpatient	135	4.2
Neurology Unit	133	4.1
Operating Room	86	2.7
Another hospital	66	2.1
Coronary Care Unit	48	1.5
Other	66	2.5
Total	3185	100.0

Discussion

This study covered the analysis of 3185 patients who were admitted to the emergency room of a hospital in the Great Lisbon and Tagus Valley region. Most patients were more than 60 years old. This patient profile is corroborated by other studies carried out in the context of urgent and emergency care (Barreira, Martins, Silva, Preto, & Preto, 2019; Fernandes et al., 2019).

The study shows that, in the majority of admissions, the patient remains in the emergency room for more than forty-five minutes. Thus, approximately seven hours of care are required daily for direct assistance to the patient, provided by at least one nurse. It should be emphasized that indirect care, that is, the period of confirmation of all the emergency room conditions, as well as the restoking and checking of materials and equipment are not included in this amount of time. Besides, part of nursing tasks is the maintenance of the emergency room for ready use, and nurses perform part of the activities carried out therein, and even unique actions of doctors require the collaboration of nurses.

The data analysis revealed that the main reasons for admission were dyspnea and electrocardiographic changes and that the majority of patients treated in the emergency room were hospitalized in the SAU or remained in the area of clinical observation. It was possible to ascertain that the morning shift had the most significant frequency of admissions, compared with the afternoon and night shifts, and it was noted that the length of stay of the patient in the emergency room was lower in the morning shift.

As the primary purpose of this study was to assess the need to allocate a nurse for exclusive service to patients from the emergency room, it should be highlighted the SAU and the area of clinical observation belong both to GES, so the patient remains under the care of nurses of the ED. As already mentioned, the nurses who are assigned to the emergency room are also allocated to other jobs. If they are called to the emergency room, the area of the clinical observation, triage, or outpatient clinic, they are under the charge of a single nurse due to the absence of the coworker who attends to the emergency room.

Massada (2002) explains that the emergency room should always be prepared for the beginning of an emergency; teamwork is critical, in a spirit of solidity and common language, the role of each team member is defined, and their responsibilities are coordinated by an element previously known. The reality described by Massada (2002) includes two doctors and two nurses in the emergency room, physically present 24 hours per day, being that a nurse is assigned exclusively to the emergency room and another to the team of intra-hospital emergency. Whenever necessary, another nurse can reinforce the team. It should be noted that the functions, as well as the training of these nurses, are carefully defined.

It is noted that the nurses called to the emergency room upon activation of the sound alarm, were previously providing care in another area, which means that that care service is with less a nurse while he or she assists in the emergency room. However, admissions to the emergency room are sometimes simultaneous, and at that time, the emergency team needs more support, meaning that three nurses are not enough to assist the two patients in the reanimation room simultaneously.

The results presented here support the need for allocation of a nurse to ensure safe staffing in the emergency room, in the context where the study was conducted. However, several studies describe the work overload and fatigue of health professionals as threats to patient safety. In this sense, The Joint Commission (2011) states that one of the factors for the occurrence of adverse events in patient

safety is the fatigue of health professionals due to work overload, long shifts, working hours above the contract hours, and insufficient staffing. It should be emphasized that the concept of workload involves not only the biological dimension but also other work-related spheres, such as mental and psycho-affective.

The opinion requested to the Portuguese Nurse College (14/2018) about this topic (Ordem dos Enfermeiros, 2018) was corroborated. The committee for the medical-surgical nursing specialty mentions that the need for specific emergency care is not standardized and, therefore, not subject to the determination of entirely controllable flows. In this way, the availability of the team should be immediate and cannot depend on the replacement in other workplaces/areas of assistance.

The Normative Circular 002/2018 issued by the DGS (2018) reinforces that, given the complexity of patients admitted to the emergency room, the team assigned there should possess specific specialized training, to be ensured by the institution, in order to respond effectively to situations whether internal or activated through priority triage.

This study has some limitations, which are related to the methodology used, the shortage of records of care provided by nurses (for example, the time required to operationalize the emergency room to allow the admission of a new patient), and research produced for comparison of results. It should be emphasized the difficulty in comparing this reality with that of another Portuguese hospital because no standardization on the exclusive service of nursing personnel to assist the critically ill person in the emergency room. Therefore, the authors suggest the continuity of studies on this theme in other clinical contexts of nursing.

Conclusion

The health professionals who work in the GES of the hospital where the study was conducted, besides conducting their activities in an unpredictable and uncertain environment in which knowledge, concentration, fast-thinking, and fast decision-making are crucial, are activated for care delivery in the emergency room where they remain during part of their shift, leaving the rest of the team overloaded. Quality of care is only possible when institutions promote working conditions, with human and physical resources and institutional processes consistent with safe practices. Given the abovementioned and the results obtained, the authors consider that the allocation of a nurse for care delivery in the emergency room of this hospital is beneficial and necessary for excellence in care, as well as the satisfaction of all involved.

Despite the literature search conducted, it was not possible to find studies in Portugal addressing this need nor literature on this theme, hence the need for standardization for safe practices in emergency room nursing staffing.

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