

Nursing Activities Score: nursing work load in a burns Intensive Care Unit¹

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Objective: to evaluate the nursing work load in a Burns Intensive Care Unit according to the Nursing Activities Score. Method: an exploratory, descriptive cross-sectional study with a quantitative approach. The Nursing Activities Score was used for data collection between October 2011 and May 2012, totalling 1,221 measurements, obtained from 50 patients' hospital records. Data for qualitative variables was described in tables; for the quantitative variables, calculations using statistical measurements were used. Results: the mean score for the Nursing Activities Score was 70.4% and the median was 70.3%, corresponding to the percentage of the time spent on direct care to the patient in 24 hours. Conclusion: the Nursing Activities Score provided information which involves the process of caring for patients hospitalized in a Burns Intensive Care Unit, and indicated that there is a high work load for the nursing team of the sector studied.

Descriptors: Workload; Nursing; Intensive Care Units; Burn Units.

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Introduction

In order to care for and treat people who have suffered burns from a wide variety of causes, with lesions differing in location, extent and depth, one needs a multiprofessional team and an appropriate place, such as a Center for Burns Treatment, which also includes the Burns Intensive Care Unit (ICU)⁽¹⁾.

The Burns ICU is considered a complex unit which brings together human resources and expensive specialized technological apparatus. It is necessary to have professionals available for this sector both qualitatively and quantitatively, due to the care required for the hospitalized patients. Because these are nursing professionals who care for the patients uninterruptedly over 24 hours, it is fundamental to assess their work load.

This evaluation is a way of making available a fair and efficient dimensioning of the human resources, affording the institutions planning which aims for benefits for all those involved, in particular the patients⁽²⁾.

The expression 'work load' is used as a method for calculating the workforce, that is, it is used regarding the demands of the labor and the analysis of the content of the different work activities⁽³⁾.

The provision of nursing staff appropriate to the standard of attendance aimed for contributes to quality care for the patients, and, as a consequence, reduction of the burden which can be present in the work, making it less stressful and safer for professionals, institutions, and patients.

Indicators of the care demands are essential as requirements to ensure quality of care and support the quantification of the personnel in the different hospital units, principally in ICU, due to there being a heavier workload because of the characteristics inherent to the patients found there⁽⁴⁾.

Instruments have been created with the aim of quantifying the nursing work load and, consequently, contributing to the appropriate dimensioning of staff for assisting the patients. Among these, the Nursing Activities Score (NAS) stands out⁽⁵⁾.

The NAS is a valuable tool for measuring work load, and can contribute to the appropriate dimensioning of nursing workers in ICU. Its use as a tool in ICU, however, has not been publicized in the literature⁽²⁾. In addition to this, the literature has indicated that the risks related to the insufficient number of nursing professionals, due to the different practice locations

and groups of workers who undertake the care, these being the central elements which must be investigated in each specific situation⁽⁶⁾.

As a result, the implementation of a system for measuring and evaluating work load has been indicated as important for planning the number of nursing professionals⁽⁷⁾. Thus, investigating the indicators of nursing work load allows managers to apply methods for dimensioning the professionals, with the aim of ensuring quality and the safety of the care, the workers, and the health institutions⁽⁸⁾.

In the light of the above, it was proposed to apply the NAS in the Burns ICU of a public teaching hospital, with the objective of evaluating this unit's nursing work load. This study could contribute to managers' being able to plan human resources in appropriate numbers, as well as the quality of care given in the Burns ICU.

Method

This is an exploratory, descriptive and cross-sectional study, with a quantitative approach, undertaken in a six-bed Burns ICU in a teaching hospital in the north of the Brazilian state of Paraná (PR). The researchers consulted the hospital records of 50 patients admitted consecutively to the Burns ICU in the period between October 4th 2011 and 30th May 2012, aged 18 years old or over, and who remained hospitalized there for a minimum period of 24 hours. Re-admissions were excluded.

The period extending from seven o'clock in the morning of one day to seven o'clock in the morning of the next day was considered as 24 hours. In the event of hospitalization, data was collected from the time of admission until seven o'clock in the morning, regardless of whether 24 hours was completed. On the day of discharge or death, data was collected from seven o'clock in the morning until when the patient left the sector, irrespective of whether 24 hours was completed.

A two-part instrument was used for data collection. The first part collected data such as: age, sex, outcome (discharge from ICU or death) and the length of hospitalization in days; in the second, the NAS instrument was applied for 241 consecutive days in the six beds of the Burns ICU, totalling 1,221 measurements obtained from the hospital records of 50 patients hospitalized in this sector.

The NAS was translated to Portuguese and validated in that language in 2002, and provides

data on activities undertaken by the nursing team by shift⁽⁴⁾ and is considered able to accurately assess the nursing work load in Adult ICU⁽⁵⁾. This instrument is made up of seven major categories of care: basic activities; ventilatory, cardiovascular, renal, neurological and metabolic support; and specific interventions. It also came to cover monitoring and control, hygiene procedures, mobilization and positioning of the patient, support and care for patients and their family members, and administrative and managerial tasks. It is made up of 23 items with 32 nursing activities⁽⁹⁾. Each activity has a score which corresponds to the percentage of the time spent on direct care undertaken in the 24-hour period. The total score can reach, at the most, 176.8% per patient. The total score results from the sum of the score of each item and allows one to calculate the amount of time spent with the nursing activities in the care for the patient⁽⁵⁾.

The statistical procedures were carried out using descriptive analysis, that is, for the qualitative variables the data was described in tables; while for the quantitative data, calculation of the statistical measurements was used. The data was organized and stored in Excel 2007 electronic spreadsheets. The Statistical Package for the Social Sciences (SPSS)[®] program, version 19.0, was used for analyzing the data.

The study was approved by the Research Ethics Committee of the State University of Londrina (UEL), under decision n. 214/2011 and the Certificate of Presentation for Ethical Consideration (CAAE) 0187.0.268.000-11 was issued.

It is emphasized that for undertaking this study, the "Terms of Confidentiality" were filled out and signed, in which the researchers accepted the commitment to maintain confidentiality regarding all the information, technical and otherwise, related to the research project, including respecting confidentiality and identity.

Results

There was a predominance of male patients (74%); age varied between 18 and 76 years old (mean of 41 years old). Regarding the depth of the burn, it was identified that 70% of the patients had third-degree burns; the length of hospitalization varied from 2 to 97 days (mean of 24 days); and the patients' discharges (74%) outweigh the deaths (26%).

In relation to the nursing work load, resulting from the application of the NAS, the mean found was 70.4%, with a minimum value of 52.5%, maximum of 97%, and median of 70.3%. Knowing that each point on the NAS corresponds to 14.4 minutes, it was ascertained that the patients in the aforesaid study needed a mean of 16.9 hours of nursing care in the 24 hour period (minimum=12.6 hours and maximum=23.2 hours). This data allows one to suggest that there is a high work load for the nursing team of the Burns ICU.

The frequency with which the activities described in the NAS instrument were recorded is demonstrated in Table 1. It was identified that 100% of the patients were scored for in the following items: Item 2 – laboratory investigations; and Item 3 – medication, apart from vasoactive drugs.

The scores with percentages above 50% corresponded to nursing interventions related to Item 17 – quantitative measurement of the urinary output (99.6%); Item 11 – treatment for improvement of pulmonary function (97.2%); Sub-item 8.a – routine tasks (91.8%); Item 21 – enteral feeding (87.7%); Item 9 – respiratory support (83.6%); Item 5 – care for drains (74.6%); Sub-item 7.a – Support and care for the family and patient for one hour (71%); Sub-item 6.b – undertaking of mobilization and positioning more than three times in 24 hours or with two nurses in any frequency (69%); Item 10 – care with artificial airways, orotracheal tubes (OTT) or tracheostomy (68.7%); Sub-item 1.b – presence at the bedside for two hours or more (68.3%); Sub-item 4.a – hygiene procedures (51.4%).

Table 1 - Distribution of the therapeutic nursing interventions according to the Nursing Activities Score. Londrina, PR, Brazil, 2011-2012

Basic Activities of the Nursing Activities Score	n	%
1 – Monitoring and control		
1. a – Vital signs and fluid balance*	42	3.4
1. b – At the bed-side for two hours or more*	834	68.3
1. c – At the bed-side for four hours or more*	345	28.2

(continue...)

Tabela 1 - continuação

Basic Activities of the Nursing Activities Score	n	%
2 – Laboratory investigations	1221	100.0
3 – Medication, apart from vasoactive drugs	1221	100.0
4 – Hygiene procedures		
4.a – Hygiene procedures*	628	51.4
4.b – Hygiene procedures for more than two hours*	427	34.9
4.c – Hygiene procedures for more than four hours*	164	13.4
5 – Drain care (apart from nasogastric tubes)	911	74.6
6 – Mobilization and positioning		
6.a – Undertaken up to three times in 24 hours*	241	19.3
6.b – Undertaken more than three times in 24 hours or with two nurses	843	69.0
6.c – Undertaken with three or more nurses*	137	11.2
7 – Support and care for the family and patient		
7.a – Support and care for the family and patient for one hour*	867	71.0
7.b – Support and care for family members for three hours or more*	-	-
8 – Administrative and managerial tasks		
8.a – Routine tasks*	1121	91.8
8.b – Administrative and managerial tasks for two hours*	100	8.1
8.c – Administrative and managerial tasks for four hours or longer	-	-
Ventilatory support		
9 – Ventilatory support	1021	83.6
10 – Care for artificial airways. Orotracheal tube or tracheostomy. Tracheostomy	840	68.7
11 – Treatment to improve pulmonary function	1187	97.2
Cardiovascular support		
12 – Vasoactive medication	419	34.3
13 – Volemic replacement with more than 3l/m ² /day	213	17.4
14 – Monitoring of left atrium. Pulmonary artery catheter	2	0.1
15 – Cardiorespiratory resuscitation, apart from precordial thump	5	0.4
Kidney support		
16 – Hemofiltration. Dialytic techniques	81	6.6
17 – Quantitative measurement of urinary output (e.g. Permanent vesical catheter)	1217	99.6
Neurological support		
18 – Measurement of intracranial pressure	-	-
Metabolic support		
19 – Treatment for complicated metabolic acidosis/alkalosis	1	0.1
20 – Intravenous hyperalimentation	18	1.4
21 – Enteral feeding (Naso-enteral tube, jejunostomy)	1072	87.7
Specific interventions		
22 – Specific interventions (intubation, surgery, endoscopy...)	15	1.2
23 – Specific interventions outside the Burns Treatment Unit	444	36.3

* The sub-items of items 1,4,6,7 and 8 are mutually exclusive

Discussion

The predominance of male burns patients was noted, which was also ascertained in a study which analyzed the epidemiological profile of patients hospitalized in a BTU (Burns Treatment Unit) in the city of Belo Horizonte, which found that 62.5% of the patients were male⁽¹⁰⁾.

Data similar to that of the present investigation was found in a study undertaken in the BTU of the Federal

University of São Paulo (UNIFESP), in which the mean age was 33.7 years old⁽¹¹⁾.

A study carried out in a BTU in Brasília, in which the mean length of hospitalization was 27 days⁽¹²⁾, was similar to the data found in the present investigation. It is inferred that the length of hospitalization may be related to the seriousness of the burn, as well as the body surface burnt.

Discharge from the Burns ICU was greater than deaths, and may be directly related to the seriousness

of the patients' condition, as well as to the care given; however, the number of deaths which occurred is considered high. A rate considered high was also found in a study of a German BTU in which the death rate was 15%⁽¹³⁾.

It is also suggested that the high rate of mortality found in this study may be related to the fact that a large number of the patients admitted to the Burns ICU unit of the HUL (Londrina University Hospital) originated from towns in the rural interior of the state of Paraná and had suffered the burn some days previously, thus contributing to the delay in initiating the specific therapy, which can have serious consequences and complications for the success of the treatment.

It is emphasized that appropriate volemic resuscitation initiated straight after the accident, represents an important gain in the survival of patients with large burns⁽¹⁴⁾. Age, and the extent and depth of the body surface burnt, are variables which can influence, to varying degrees, the occurrence of death⁽¹⁵⁾. It is therefore probable that these variables may have contributed to the high rate of mortality observed in the present study.

The activities evaluated by the NAS instrument in this study showed a high mean work load in the Burns ICU, which may suggest burden for this sector's nursing team, that is, an insufficient number of professionals. This data indicates a high demand for nursing care, demonstrating that to provide care within what is considered the ideal, it would be necessary to have one nursing professional to attend, comprehensively, only one patient per work period.

Thus, the importance is shown of the dimensioning of the nursing team, as the human resources, in quantity and quality, are essential for caring comprehensively for the patient and his or her family members, as well as for promoting appropriate conditions for the work of the nursing team, improving their quality of life and affording safety to the institution⁽¹⁶⁾.

This high mean was shown to be higher than that of the study undertaken in a general ICU in a medium-size* University Hospital in São Paulo, in which the mean of the NAS was 66.5% and remained above 50% throughout the period of hospitalization in that unit⁽¹⁷⁾.

In another investigation carried out in a general adult ICU in a private hospital, also in the city of São Paulo, the data was similar to the present study's

findings, in observing that the mean of the 24-hour NAS was 69.6%⁽¹⁸⁾. Also in the city of São Paulo, another study showed a mean NAS equal to 69.9%, in five ICUs in two private hospitals, a result which is similar to that found in the present investigation⁽¹⁹⁾. In a post-operative cardiac surgery ICU in another Sao Paulo hospital, a mean of 73.7% for the NAS was found⁽²⁰⁾.

However, a study which analyzed adult patients hospitalized in ICUs in two public hospitals and two private hospitals in the city of São Paulo identified mean nursing work load on admission equal to 61.9% and 52.8% on the last day of hospitalization – data which is below the present investigation's results⁽²¹⁾. Another study on nursing work load in an Adult ICU in the interior of the state of São Paulo identified a mean NAS equal to 62.2%, that is, below what was identified in the present investigation⁽¹⁶⁾.

A study undertaken in Spain in a cardiology ICU identified a mean NAS of 41%, this data being lower than that of the present study, as well as lower than the values found in studies undertaken in Brazil in this type of unit⁽²²⁾. Yet another investigation, this one carried out in a cardiology and neurology ICU in a tertiary São Paulo hospital, found a mean NAS equal to 65.18%⁽²³⁾.

Of the studies found on the NAS in ICU undertaken in Brazil, only two identified means higher than those of the present investigation; one undertaken in the north-west of the state of Paraná (mean for the NAS of 104%)⁽²⁴⁾ and the other carried out in a surgical cardiology ICU in a public teaching hospital in the city of Sao Paulo (daily mean of 74.6%)⁽²⁵⁾.

Conclusion

With the results found, it can be asserted that the NAS instrument was able to provide information concerning the process of caring for patients hospitalized in a Burns ICU, and by applying it, it was identified that there is a high work load, that is, burden for the nursing team of the unit studied.

Although this investigation's results contribute to the advance of knowledge and have achieved the objective proposed, it is important to consider – as limitations of the study – that it was undertaken in only one Burns ICU (not permitting the generalization of the findings), the inexistence of Brazilian studies using the NAS in burns patients hospitalized in ICU, the small sample, and the non-correlation of work load with the

* In Brazil, a 'medium-size' hospital has between 50 and 149 beds. Translator's note.

variables of age and the patient's clinical conditions, among others.

Thus, it is suggested that further studies in this line be undertaken, with the same characteristics of the population studied, or in multi-centric studies, with the aim of showing the institutions that through the systematized application of the NAS, it is possible to use it as an indicator for work load and, consequently, for assisting in the appropriate dimensioning of the nursing team for the assistance for the patient.

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