

Nursing workload among adults, elderly and very elderly patients in the Intensive Care Unit

CARGA DE TRABALHO DE ENFERMAGEM REQUERIDA POR ADULTOS, IDOSOS E MUITO IDOSOS EM UNIDADE DE TERAPIA INTENSIVA

CARGA DE TRABAJO DE ENFERMERÍA RELACIONADA A ADULTOS, ANCIANOS Y MUY ANCIANOS EN TERAPIA INTENSIVA

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ABSTRACT

The study's objectives were to compare nursing workload among adults, elderly and very elderly patients, including in the analyses the interventions and evolution of the workload between admission and discharge. This prospective longitudinal study involved 600 adult patients in general ICU in four city hospitals in Sao Paulo. The results showed that, independent of the age, it had the similarity of the nursing workload in the admission, as well as in the evolution of the patients' care. Differences between the groups were observed in the NAS on ICU's discharge and the following instrument's items: *Monitoring and titration* and *Hygiene procedures* in admission, *Respiratory support* and *Intravenous hyperalimentation* in discharge and *Mobilization and positioning* in discharge and admission. In conclusion, the results evidenced that the age interfered only in specific aspects of the nursing workload required by patients in ICUs.

KEY WORDS

Workload.
Nursing.
Intensive Care Units.
Age groups.

RESUMO

O objetivo deste estudo foi comparar a carga de trabalho de enfermagem requerida pelos pacientes adultos, idosos e muito idosos, incluindo nas análises as intervenções realizadas e a evolução da carga de trabalho entre admissão e alta. Estudo prospectivo, longitudinal, realizado em UTIs gerais de quatro hospitais do Município de São Paulo. Os resultados apontaram que, independente da idade, houve similaridade da carga de trabalho de enfermagem na admissão, bem como na evolução das demandas de cuidados dos pacientes. Diferenças entre os grupos foram observadas no NAS na alta da UTI e nos seguintes itens desse instrumento: *Monitorização e controles* e *Procedimentos de higiene*, na admissão, *Suporte respiratório e Hiperalimentação intravenosa* na alta e *Mobilização e posicionamento* tanto na alta como na admissão. Concluiu-se, portanto, que a idade interferiu somente em aspectos específicos da carga de trabalho de enfermagem requeridas por pacientes internados em UTIs.

DESCRIPTORES

Carga de trabalho.
Enfermagem.
Unidades de Terapia Intensiva.
Grupos etários.

RESUMEN

El objetivo fue comparar la carga de trabajo de enfermería entre los pacientes adultos, ancianos y muy ancianos, incluyendo en las análisis las intervenciones y la evolución de la carga de trabajo entre admisión y alta. Estudio prospectivo longitudinal de 600 pacientes adultos internados en la UCI general de cuatro hospitales de São Paulo. Como resultados, independientemente de la edad, hubo similitud de la carga de trabajo de enfermería en la admisión y evolución de las demandas de cuidados. Diferencias entre los grupos fueron observadas en el NAS en la alta de la UCI y en los siguientes apartados de esta herramienta: *Monitorización y controles* y *Procedimientos de higiene*, en la admisión; *Soporte ventilatorio e Iperalimentación intravenosa* en la alta; y *Mobilización y posicionamiento* en la alta y admisión. Se concluye, por tanto, que la edad interfiere sólo en aspectos específicos de la carga de trabajo en enfermería requeridos por los pacientes internados en la UCI.

DESCRIPTORES

Carga de trabajo.
Enfermería.
Unidades de Terapia Intensiva.
Grupos por edad.

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INTRODUCTION

Intensive Care Units (ICUs) are high-cost units, as they demand high-tech equipment, a distinguished physical space and highly qualified staff. Researches appoint that specialized nursing workforce is one of the main sources of resource consumption in these environments, explaining the need for adequate staff dimensioning⁽¹⁻⁴⁾. In this context, one of the challenges ICU managers face is to adapt the nursing staff to the care demands of severe patients, which includes an increasingly large contingent of elderly and elder elderly patients, due to global population aging.

According to the World Health Organization (WHO)⁽⁵⁾, in the period from 2005 to 2040, a 164% increase in the elderly population (over 65 years of age) is estimated, a 301% increase in those older than 85 years and a 746% increase in people over 100 years old.

In Brazil, the number of elderly has grown from 3 million in 1960 to 7 million in 1975 and 17 million in 2006, i.e. a 600% rise in less than fifty years. Moreover, conservative projections indicate that, in 2020, Brazil will occupy the sixth place in the global ranking of elderly people, with a group of more than 30 million elderly⁽⁶⁾.

In view of this scenario and considering that aging is characterized by the gradual deterioration of functional reserves, increased comorbidities, disabilities and decreased independence and autonomy, an increasing number of elderly patients is expected, needing health care in ICUs⁽⁷⁻⁸⁾.

Despite controversies about admitting elderly people to critical care units⁽⁷⁻⁸⁾, once at the unit, patients demand nursing care that should be delivered by an adequate number of staff. In that sense, it is interesting to find out how elderly people participate in this context and whether adult patients in progressive age ranges consume a greater nursing workload for their care.

OBJECTIVES

Considering those issues, this research aims to compare the nursing workload required by adult, elderly and elder elderly patients, including the interventions made and the evolution of the workload upon admission to and discharge from ICUs into analyses.

METHOD

This is a prospective, longitudinal study of adult patients hospitalized in general ICUs of two public and two private hospitals. Hospital selection was based on the

following criteria: location in São Paulo City; medium, large or extra large size; presence of general ICU and intermediate unit. Besides an exclusively pediatric clientele, exclusion criteria included a number of ICU beds corresponding to less than 6% of all hospital beds and less than five beds in the intermediary unit⁽⁹⁾.

Participants comprised 600 patients ≥ 18 years of age, admitted at these ICUs between August 2006 and January 2007, who remained at the unit for 24 hours or more.

After approval obtained from the Research Ethics Committees (No SMS52/2006; HU650/06; HSL2006/03 and AE06/510) data collection started at the selected units. Each day, new patients were selected, while those already included in the research were followed up. Follow-up lasted until discharge from the ICU, so as to obtain data from the first and last 24 hours of stay at the unit.

The nursing workload was measured by the Nursing Activities Score – NAS⁽²⁾, while death risk was established according to the Simplified Acute Physiology Score II – SAPS II⁽¹⁰⁾ and the Logistic Organ Dysfunction Score – LODS⁽¹¹⁾.

Data were processed in Stata for Windows 8.0 and SPSS 13.0 for Windows. To compare patient groups according to age, three age ranges were considered, which include people aged: ≥ 18 and < 60 years (adults), ≥ 60 and < 80 years (elderly) and ≥ 80 years (elder elderly).

In the analysis of interventions described in the NAS, items 2, 3, 5 and 9-23 were considered dichotomous variables and patients were distributed according to the presence or absence of these interventions. In items 1, 4, 6, 7 and 8, with mutually exclusive sub-items, patients were distributed according to the following classification: sub-item 1a or 1b and 1c; 4a or 4b and 4c; 6a or 6b and 6c; 7a or 7b and 8a or 8b and 8c.

To compare the groups of adult, elderly and elder elderly patients, Pearson's association Chi-Square test was used. When the result of this test indicated a statistically significant difference between the groups ($p \leq 0.05$), pairs of groups were submitted to complementary analysis: adults versus elderly, elderly versus elder elderly and adults versus elder elderly, so as to identify elements of distinction among the three groups.

The evolution of patients' workload during the hospitalization period at the ICUs was analyzed, considering the difference in total NAS score between the patient's first and last day of hospitalization at the ICU ((NAS admission – NAS discharge or death).

In this analysis, besides mean NAS scores (admission to and discharge from ICU), the groups were compared

One of the challenges ICU managers face is to adapt the nursing staff to the care demands of severe patients, which includes an increasingly large contingent of elderly and elder elderly patients.

through the One-Way Anova test. In case differences were indicated, Tukey's test was applied to check between which groups the difference occurred. All analyses were done with $\alpha \leq 0.05$.

RESULTS

Among the 600 patients under analysis, men predominated, with 56.70% of all patients hospitalized at the ICUs. Ages ranged from 18 to 97 years, with 46.50% between ≥ 18 and < 60 years (279 persons), 36.00% between ≥ 60 and < 80 years (216) and 17.50% ≥ 80 years (105). Sample patients mean age was 60.76 years and the median was 62 years.

Among clinical characteristics, most patients came from the Emergency or Urgency Care Unit (36.34%) or Surgical Center (35.50%). The analysis of comorbidities showed that the most frequent category of antecedents was related to diseases of the circulatory system (58.00%). The mean hospitalization time at the ICUs was 8.90 (± 10.90) days and mortality amounted to 20.00%. Among patients who survived ($n=480$), 64.60% were discharged to intermediate units and 32.90% were directly transferred to hospitalization units.

As for the risk of death upon admission to the ICUs, the mean was 25.50% according to the SAPS II and 21.43% according to the LODS, close to the levels found upon discharge from these units, with 23.14% and 20.73%, respectively.

Table 1 - Measures of central tendency upon admission and discharge of patients hospitalized at ICUs ($n=600$) according to age range - São Paulo - 2006/2007

| Variables | Age ranges | | | | | | p* |
|---------------|------------------------------------|-------|-------------------------------------|-------|--------------------------------|-------|-------------|
| | Adults (≥ 18 and < 60) | | Elderly (≥ 60 and < 80) | | Elder elderly (≥ 80) | | |
| | Mean | SD | Mean | SD | Mean | SD | |
| NAS admission | 59.98 | 22.40 | 64.41 | 20.66 | 62.45 | 20.80 | 0.07 |
| NAS discharge | 50.37 | 14.56 | 55.85 | 16.77 | 53.39 | 16.17 | 0.00 |

* OneWay-Anova Test

As observed in Table 1, among the groups, the mean NAS score ranged from 64.41 to 59.98 upon admission and from 55.85 to 50.37 upon discharge, with the elderly group obtaining the highest mean score at both times. A statistically significant difference was found among the groups for the NAS score only upon the patient's discharge from the ICUs ($p=0.00$). Tukey's test identified that this difference occurred between the adult and elderly group ($p=0.00$).

Table 2 shows differences among adult, elderly and elder elderly patients upon admission with regard to the following interventions: *Monitoring and titration*, *Hygiene procedures* and *Mobilization and positioning*.

As for *Monitoring and titration*, when comparing pairs of groups through the Chi-Square test, it was observed that this difference occurred between adults and elderly, with $p=0.01$. No differences were found, however, between the elder elderly group and others.

Adults showed a higher frequency (55.56%) than elderly (43.81%) with regard to *item a* (*hourly vital signs, regular registration and calculation of fluid balance*). The opposite occurred on *item b and c* (*need for presence at the*

bedside for monitoring and control during 2 hours or more in any shift, or for 4 hours or more in case of item c), in which the elderly were more frequent (56.19%), characterizing that this group demanded more nursing care time on *Monitoring and titration*.

As for *Hygiene procedures*, comparisons between pairs identified that the group of elder elderly differed from the adult ($p=0.01$) as well as the elderly group ($p=0.02$).

Elder elderly presented a higher frequency (31.37%) of *hygiene procedures that took more than 2 hours (item b) or more than 4 hours during any shift (item c)* in comparison with the other groups (18.89% and 19.52%), evidencing that this group needed more nursing time related to this type of care.

As for *Mobilization and positioning*, adults differed from the elderly ($p=0.00$) and the elder elderly ($p=0.03$) when comparing pairs of groups. The *accomplishment of the procedure more than thrice in 24 hours or involving 2 nurses with any frequency (item b) and 3 or more nurses (item c)* was more frequent in the elderly (64.76%) and elder elderly group (55.88%) than in the adult group (42.96%).

Table 2 - Distribution of patients hospitalized at ICUs (n=582*) according to age range and type of intervention performed upon admission, according to the NAS - São Paulo - 2006/2007

| Type of interventions - NAS | Categories | Age ranges | | | | | | p** |
|--|------------|-------------------------|-------|--------------------------|--------|------------------------|--------|-------------|
| | | Adults (≥18 and <60) | | Elderly (≥60 and <80) | | Elder elderly (≥80) | | |
| | | N | % | N | % | N | % | |
| 1- Monitoring and titration | 1a | 150 | 55.56 | 92 | 43.81 | 52 | 50.98 | 0.04 |
| | 1b and c | 120 | 44.44 | 118 | 56.19 | 50 | 49.02 | |
| 2- Laboratory | Yes | 269 | 99.63 | 210 | 100.00 | 102 | 100.00 | 0.56 |
| | No | 1 | 0.37 | - | - | - | - | |
| 3- Medication | Yes | 269 | 99.63 | 209 | 99.52 | 102 | 100.0 | 0.79 |
| | No | 1 | 0.37 | 1 | 0.48 | - | - | |
| 4- Hygiene procedures | 4a | 219 | 81.11 | 169 | 80.48 | 70 | 68.63 | 0.02 |
| | 4b and c | 51 | 18.89 | 41 | 19.52 | 32 | 31.37 | |
| 5- Care of drains | Yes | 173 | 64.07 | 136 | 64.76 | 64 | 62.75 | 0.94 |
| | No | 97 | 35.93 | 74 | 35.24 | 38 | 37.25 | |
| 6- Mobilization and positioning | 6a | 154 | 57.04 | 74 | 35.24 | 45 | 44.12 | 0.00 |
| | 6b and c | 116 | 42.96 | 136 | 64.76 | 57 | 55.88 | |
| 7- Support and care of relatives and patient | 7a | 252 | 93.33 | 194 | 92.38 | 98 | 96.08 | 0.46 |
| | 7b | 18 | 6.67 | 16 | 7.62 | 4 | 3.92 | |
| 8- Administrative and managerial tasks | 8a | 194 | 71.85 | 140 | 66.67 | 74 | 72.55 | 0.42 |
| | 8b and c | 76 | 28.15 | 70 | 33.33 | 28 | 27.45 | |
| 9- Respiratory support | Yes | 193 | 71.48 | 169 | 80.48 | 74 | 72.55 | 0.06 |
| | No | 77 | 28.52 | 41 | 19.52 | 28 | 27.45 | |
| 10- Care of artificial airways | Yes | 94 | 34.81 | 76 | 36.19 | 44 | 43.14 | 0.32 |
| | No | 176 | 65.19 | 134 | 63.81 | 58 | 56.86 | |
| 11- Treatment for improving lung function | Yes | 97 | 35.93 | 69 | 32.86 | 39 | 38.24 | 0.61 |
| | No | 173 | 64.07 | 141 | 67.14 | 63 | 61.76 | |
| 12- Vasoactive medication | Yes | 76 | 28.15 | 72 | 34.29 | 28 | 27.45 | 0.28 |
| | No | 194 | 71.85 | 138 | 65.71 | 74 | 72.55 | |
| 13- Intravenous replacement of large fluid losses | Yes | 27 | 10.00 | 19 | 9.05 | 6 | 5.88 | 0.46 |
| | No | 243 | 90.00 | 191 | 90.95 | 96 | 94.12 | |
| 14- Left atrium monitoring | Yes | 3 | 1.11 | 5 | 2.38 | 1 | 0.98 | 0.47 |
| | No | 267 | 98.89 | 205 | 97.62 | 101 | 99.02 | |
| 15- Cardiopulmonary resuscitation after arrest | Yes | 4 | 1.48 | 3 | 1.43 | - | - | 0.47 |
| | No | 266 | 98.52 | 207 | 98.57 | 102 | 100.00 | |
| 16- Hemofiltration techniques | Yes | 20 | 7.41 | 12 | 5.71 | 6 | 5.88 | 0.73 |
| | No | 250 | 92.59 | 198 | 94.29 | 96 | 94.12 | |
| 17- Quantitative urine output measurement | Yes | 254 | 94.07 | 197 | 93.81 | 94 | 92.16 | 0.79 |
| | No | 16 | 5.93 | 13 | 6.19 | 8 | 7.84 | |
| 18- Measurement of intracranial pressure | Yes | 10 | 3.70 | 2 | 0.95 | 1 | 0.98 | 0.08 |
| | No | 260 | 96.30 | 208 | 99.05 | 101 | 99.02 | |
| 19- Treatment of complicated metabolic acidosis/alkalosis | Yes | 4 | 1.48 | 5 | 2.38 | 4 | 3.92 | 0.36 |
| | No | 266 | 98.52 | 205 | 97.62 | 98 | 96.08 | |
| 20- Intravenous hyperalimentation | Yes | 13 | 4.81 | 16 | 7.62 | 7 | 6.86 | 0.43 |
| | No | 257 | 95.19 | 194 | 92.38 | 95 | 93.14 | |
| 21- Enteral feeding | Yes | 58 | 21.48 | 52 | 24.76 | 32 | 31.37 | 0.14 |
| | No | 212 | 78.52 | 158 | 75.24 | 70 | 68.63 | |
| 22- Specific interventions in the intensive care unit | Yes | 18 | 6.67 | 22 | 10.48 | 8 | 7.84 | 0.32 |
| | No | 252 | 93.33 | 188 | 89.52 | 94 | 92.16 | |
| 23- Specific interventions outside the intensive care unit | Yes | 16 | 5.93 | 10 | 4.76 | 1 | 0.98 | 0.13 |
| | No | 254 | 94.07 | 200 | 95.24 | 101 | 99.02 | |

* OneWay-Anova Test

In Table 3, intergroup differences upon discharge appear for the following interventions: *Mobilization and positioning, Respiratory support and Intravenous hyperalimentation.*

Table 3 - Distribution of patients hospitalized at ICUs (n=582*) according to age range and type of intervention performed upon discharge, according to the NAS - São Paulo - 2006/2007

| Type of interventions - NAS | Categories | Age ranges | | | | | | p** |
|--|------------|-------------------------|-------|--------------------------|-------|------------------------|--------|-------------|
| | | Adults (≥18 and <60) | | Elderly (≥60 and <80) | | Elder elderly (≥80) | | |
| | | N | % | N | % | N | % | |
| 1- Monitoring and titration | 1a | 184 | 68.15 | 137 | 65.24 | 71 | 69.61 | 0.69 |
| | 1b and c | 86 | 31.85 | 73 | 34.76 | 31 | 30.39 | |
| 2- Laboratory | Yes | 254 | 94.07 | 203 | 96.67 | 100 | 98.04 | 0.17 |
| | No | 16 | 5.93 | 7 | 3.33 | 2 | 1.96 | |
| 3- Medication | Yes | 267 | 98.89 | 204 | 97.14 | 100 | 98.04 | 0.38 |
| | No | 3 | 1.11 | 6 | 2.86 | 2 | 1.96 | |
| 4- Hygiene procedures | 4a | 229 | 84.81 | 175 | 83.33 | 83 | 81.37 | 0.71 |
| | 4b and c | 41 | 15.19 | 35 | 16.67 | 19 | 18.63 | |
| 5- Care of drains | Yes | 149 | 55.19 | 122 | 58.10 | 61 | 59.80 | 0.67 |
| | No | 121 | 44.81 | 88 | 41.90 | 41 | 40.20 | |
| 6- Mobilization and positioning | 6a | 171 | 63.33 | 99 | 47.14 | 55 | 53.92 | 0.00 |
| | 6b and c | 99 | 36.67 | 111 | 52.86 | 47 | 46.08 | |
| 7- Support and care of relatives and patient | 7a | 266 | 98.52 | 202 | 96.19 | 99 | 97.06 | 0.27 |
| | 7b | 4 | 1.48 | 8 | 3.81 | 3 | 2.94 | |
| 8- Administrative and managerial tasks | 8a | 243 | 90.00 | 176 | 83.81 | 93 | 91.18 | 0.06 |
| | 8b and c | 27 | 10.00 | 34 | 16.19 | 9 | 8.82 | |
| 9- Respiratory support | Yes | 145 | 53.70 | 146 | 69.52 | 67 | 65.69 | 0.00 |
| | No | 125 | 46.30 | 64 | 30.48 | 35 | 34.31 | |
| 10- Care of artificial airways | Yes | 50 | 18.52 | 52 | 24.76 | 28 | 27.45 | 0.10 |
| | No | 220 | 81.48 | 158 | 75.24 | 74 | 72.55 | |
| 11- Treatment for improving lung function | Yes | 86 | 31.85 | 72 | 34.29 | 43 | 42.16 | 0.17 |
| | No | 184 | 68.15 | 138 | 65.71 | 59 | 57.84 | |
| 12- Vasoactive medication | Yes | 41 | 15.19 | 50 | 23.81 | 20 | 19.61 | 0.06 |
| | No | 229 | 84.81 | 160 | 76.19 | 82 | 80.39 | |
| 13- Intravenous replacement of large fluid losses | Yes | 10 | 3.70 | 4 | 1.90 | - | - | 0.10 |
| | No | 260 | 96.30 | 206 | 98.10 | 102 | 100.00 | |
| 14- Left atrium monitoring | Yes | 5 | 1.85 | 5 | 2.38 | - | - | 0.31 |
| | No | 265 | 98.15 | 205 | 97.62 | 102 | 100.00 | |
| 15- Cardiopulmonary resuscitation after arrest | Yes | 13 | 4.81 | 13 | 6.19 | 2 | 1.96 | 0.26 |
| | No | 257 | 95.19 | 197 | 93.81 | 100 | 98.04 | |
| 16- Hemofiltration techniques | Yes | 19 | 7.04 | 11 | 5.24 | 6 | 5.88 | 0.71 |
| | No | 251 | 92.96 | 199 | 94.76 | 96 | 94.12 | |
| 17- Quantitative urine output measurement | Yes | 228 | 84.44 | 188 | 89.52 | 89 | 87.25 | 0.26 |
| | No | 42 | 15.56 | 22 | 10.48 | 13 | 12.75 | |
| 18- Measurement of intracranial pressure | Yes | 4 | 1.48 | 2 | 0.95 | - | - | 0.45 |
| | No | 266 | 98.52 | 208 | 99.05 | 102 | 100.00 | |
| 19- Treatment of complicated metabolic acidosis/alkalosis | Yes | 4 | 1.48 | 3 | 1.43 | 1 | 0.98 | 0.93 |
| | No | 266 | 98.52 | 207 | 98.57 | 101 | 99.02 | |
| 20- Intravenous hyperalimentation | Yes | 13 | 4.81 | 30 | 14.29 | 7 | 6.86 | 0.00 |
| | No | 257 | 95.19 | 180 | 85.71 | 95 | 93.14 | |
| 21- Enteral feeding | Yes | 58 | 21.48 | 49 | 23.33 | 30 | 29.41 | 0.27 |
| | No | 212 | 78.52 | 161 | 76.67 | 72 | 70.59 | |
| 22- Specific interventions in the intensive care unit | Yes | 4 | 1.48 | 3 | 1.43 | 1 | 0.98 | 0.93 |
| | No | 266 | 98.52 | 207 | 98.57 | 101 | 99.02 | |
| 23- Specific interventions outside the intensive care unit | Yes | 8 | 2.96 | 3 | 1.43 | 2 | 1.96 | 0.52 |
| | No | 262 | 97.04 | 207 | 98.57 | 100 | 98.04 | |

*missing: 9 in the age range between >18 and <60, 6 between >60 and <80 and 3 >80 years.

** Chi-Square test

With regard to *Mobilization and positioning*, comparison between paired groups through the Chi-Square test showed that this difference occurred between the adult

and elderly groups (p=0.00), with higher frequency (52.86%) of *items 6b and 6c* for the elderly than for the adult group (36.67%), thus needing more nursing time to perform these

procedures. Nevertheless, differences between elderly (52.86%) and elder elderly (46.08%) and between adults (36.67%) and elder elderly (46.08%) did not reach the significance level set forth in this research ($p \leq 0.05$).

As for *Respiratory support*, the adult group differed from the elderly ($p=0.00$) and elder elderly ($p=0.04$). Elderly and elder elderly need *Respiratory support* more frequently during the last 24 hours of hospitalization at the ICU, with 69.52% and 65.69% respectively, than adults (53.70%).

Table 4 - Difference in NAS between admission and discharge of ICU patients (n=600), survivors (n=480) and those who died at the unit (n=120), according to age range - São Paulo – 2006/2007

| NAS Difference admission/discharge | Age ranges | | | | | | p* |
|------------------------------------|-------------------------------|-------|--------------------------------|-------|-----------------------------|-------|------|
| | Adults (≥ 18 e < 60) | | Elderly (≥ 60 e < 80) | | Elder elderly (≥ 80) | | |
| | Mean | SD | Mean | SD | Mean | SD | |
| All patients | 9.61 | 20.16 | 8.56 | 22.74 | 9.05 | 21.26 | 0.86 |
| Survivors | 11.27 | 19.54 | 12.71 | 21.48 | 10.91 | 21.83 | 0.74 |
| No survivors | 0.77 | 21.36 | 3.59 | 22.13 | 1.59 | 17.35 | 0.49 |

* OneWay-Anova Test

In the analysis of mean differences in NAS between admission and discharge, no significant difference was found among the three groups when alive and dead patients were analyzed jointly, nor when analyzed separately (Table 4).

DISCUSSION

With regard to the characteristics of the total sample, similarity with other studies was found for the following variables: age⁽¹²⁻¹⁴⁾, gender⁽¹²⁻¹⁷⁾, origin⁽¹⁵⁻¹⁷⁾, antecedents⁽¹⁵⁻¹⁷⁾, severity of illness^(14,16) and nursing workload upon admission at the ICU^(12,14-15,17). Mortality and length of stay (LOS) in ICU greatly varied in literature⁽¹²⁻¹⁷⁾ and were intermediate in this research when compared to findings described in other studies.

The population's age has progressively increased in Brazil⁽⁶⁾ and in other countries⁽⁵⁾ and nurses' clinical experience has evidenced the increased number of elderly patients at ICUs, in line with the growth of this population. A study carried out in Switzerland confirmed this premise in a comparative analysis of 35.327 ICU patients' characteristics, hospitalized between 1980 and 1995, showing a significant increase in patients' age during that period⁽¹⁾.

Although it has already been described in literature^(7-8,18) that age does not determine a worse prognosis, but associated factors, such as the severity of an acute dysfunction and comorbidities, health professionals still perceive that elderly patients respond less to certain therapeutic measures and, therefore, demand more care.

Nevertheless, these study results reveal that the age factor interferes little in the workload of care delivered to ICU patients, in line with other studies that compare elderly (≥ 60 years) and non elderly patients (≥ 18 and < 60 years)⁽¹⁵⁾ and only elderly patients from different age ranges

Intravenous hyperalimentation was more frequent among elderly patients (14.29%). The comparison between paired groups revealed a statistically significant difference between elderly and adults ($p=0.00$), while the comparison between the elderly and elder elderly bordered upon significance ($p=0.06$).

It should be highlighted that statistically significant differences among the three groups were found for only three of the 23 NAS items, upon admission and also upon discharge from the ICU, as observed in Tables 2 and 3.

(≥ 60 and < 70 ; ≥ 70 and < 80 ; ≥ 80)⁽¹⁶⁾. Moreover, studies that analyzed the influence of different variables (gender, age, LOS, mortality, severity, origin and treatment type) on NAS scores evidenced that age did not interfere in the nursing workload demand, reasserting that therapeutic investments are applied to promote patients' clinical improvement, independently of the age range^(12-13,17).

The evolution in the demand for nursing workload between admission to and discharge from the ICU (NAS admission – NAS discharge) and NAS scores upon admission were similar among the three groups. This may be related to the intervention pattern applied to patients hospitalized at ICUs, independently of age. The nursing workload upon discharge, however, showed differences between adult and elderly patients, indicating that, probably, elderly patients continue demanding more care after discharge from an ICU.

In this study, it was interesting that punctual differences among the three groups referred to NAS procedures related to characteristic nursing activities (*Monitoring and titration*, *Mobilization and positioning* and *Hygiene procedures*) upon admission. Upon discharge, on the other hand, this difference was present in interventions associated with other professionals' actions (*Respiratory support* and *Intravenous hyperalimentation*). As to these findings, it should be highlighted that the adult group demanded a lesser nursing workload with regard to these interventions. The elderly and elder elderly groups, on the other hand, alternated in the greatest demand for nursing workload related to these items.

Although only few NAS items presented intergroup differences, the results demonstrate that, mainly in terms of characteristic nursing interventions, elderly and elder elderly patients demand more nursing workload. These demands should be taken into account in ICU staff dimensioning as

well as in daily team distribution. Moreover, patients aged ≥ 60 years (elderly and elder elderly) demanded more care and their demands were complied with. Hence, it can be inferred that, once admitted to the ICU, no distinction is made with regard to therapeutic and nursing investments.

CONCLUSION

These study results indicated that, independently of age, nursing workload upon admission at the unit were similar. The same was true for the evolution of ICU patients' care demands. Likewise, no differences were found on 20 of the 23 NAS items between admission and discharge from the unit.

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