

# FACTORS ASSOCIATED WITH LONGER STAY IN INTENSIVE CARE UNIT

## FATORES ASSOCIADOS AO MAIOR TEMPO DE PERMANÊNCIA EM UNIDADE DE TERAPIA INTENSIVA

## FACTORES ASOCIADOS AL MAYOR TIEMPO DE PERMANENCIA EN UNIDAD DE CUIDADOS INTENSIVOS

Anarilda Pimentel Costa<sup>1</sup>  
Rosana Santos Mota<sup>2</sup>  
Valdenir Almeida da Silva<sup>3</sup>  
Carolina Calixto de Souza Andrade<sup>4</sup>  
Susan Martins Pereira<sup>5</sup>

**How to cite this article:** Costa AP, Mota RS, Silva VA, Andrade CCS, Pereira SM. Factors associated with longer stay in Intensive Care Unit. Rev baiana enferm. 2022;36:e43620.

**Objective:** to identify the factors associated with longer stay of patients in the Intensive Care Unit. **Method:** this is a quantitative cross-sectional study with 105 patients admitted to the Intensive Care Unit of a public hospital in Salvador, Bahia. Data were organized in Stata, version 12. **Results:** there was an association with statistical significance between longer hospitalization time with: clinical causes (PR=4.76 and 95%CI: 1.86 – 12.19); use of central venous catheter (PR=5.08 and 95%CI: 1.84 - 14.01); use of mechanical ventilation (PR=3.03 and 95%CI: 1.15 – 7.97); and clinical outcome of death (PR=4.77 and 95%CI: 1.47 – 15.42). **Conclusion:** the findings point to preventive actions to reduce hospitalization time, such as infection control using aseptic techniques in the management of invasive devices.

**Descriptors:** Intensive Care Units. Hospitalization. Length of Stay. Nursing. Nursing Care.

*Objetivo:* identificar os fatores associados ao maior tempo de permanência dos pacientes na Unidade de Terapia Intensiva. *Método:* trata-se de estudo quantitativo do tipo corte transversal com 105 pacientes internados em Unidade de Terapia Intensiva de um hospital público de Salvador, Bahia. Os dados foram organizados no Stata, versão 12. *Resultados:* houve associação com significância estatística entre maior tempo de internação com: causas clínicas (RP=4,76 e IC95%: 1,86 – 12,19); uso de cateter venoso central (RP=5,08 e IC95%: 1,84 – 14,01); uso de ventilação mecânica (RP=3,03 e IC95%: 1,15 – 7,97); e desfecho clínico de óbito (RP=4,77 e IC95%: 1,47 – 15,42). *Conclusão:* os achados direcionam para ações preventivas para diminuição do tempo de internamento, como o controle de infecções mediante a utilização de técnicas assépticas no manejo de dispositivos invasivos.

*Descritores:* Unidade de Terapia Intensiva. Hospitalização. Tempo de Internação. Enfermagem. Cuidados de Enfermagem.

<sup>1</sup> Complexo Hospitalar Professor Edgard Santos. Salvador, Bahia, Brazil. <http://orcid.org/0000-0001-9830-5539>. In Memoriam.

<sup>2</sup> Complexo Hospitalar Professor Edgard Santos. Salvador, Bahia, Brazil. [rosana17santos@yahoo.com.br](mailto:rosana17santos@yahoo.com.br). <http://orcid.org/0000-0002-3193-9972>.

<sup>3</sup> Complexo Hospitalar Professor Edgard Santos. Salvador, Bahia, Brazil. <http://orcid.org/0000-0003-1947-468X>.

<sup>4</sup> Complexo Hospitalar Professor Edgard Santos. Salvador, Bahia, Brazil. <http://orcid.org/0000-0003-3682-5525>.

<sup>5</sup> Instituto de Saúde Coletiva da Universidade Federal da Bahia. Salvador, Bahia, Brazil. <http://orcid.org/0000-0001-5291-454X>.

*Objetivo: identificar los factores asociados al mayor tiempo de permanencia de los pacientes en la Unidad de Terapia Intensiva. Método: se trata de estudio cuantitativo del tipo corte transversal con 105 pacientes internados en Unidad de Terapia Intensiva de un hospital público de Salvador, Bahía. Los datos fueron organizados en Stata, versión 12. Resultados: hubo asociación con significación estadística entre mayor tiempo de internación con: causas clínicas (RP=4,76 e IC95%: 1,86–12,19); uso de catéter venoso central (RP=5,08 e IC95%: 1,84–14,01); uso de ventilación mecánica (RP=3,03 e IC95%: 1,15–7,97); y resultado clínico de defunción (RP=4,77 e IC95%: 1,47–15,42). Conclusión: los hallazgos apuntan hacia acciones preventivas para disminución del tiempo de internamiento, como el control de infecciones mediante la utilización de técnicas asépticas en el manejo de dispositivos invasivos.*

*Descriptores: Unidades de Cuidados Intensivos. Hospitalización. Tiempo de Internación. Enfermería. Atención de Enfermería.*

## Introduction

The Intensive Care Unit (ICU) has, among other functions, the objective of restoring the health of individuals with severe pathologies, to remove them from the risk zone for death. To do so, it has a specialized professional apparatus and advanced technologies that aim to meet their health demands<sup>(1)</sup>.

Despite this configuration, the literature has been signaling factors that interfere in the care process of people hospitalized in ICU. Studies warn about situations that affect the satisfactory functioning of this service, such as the overload of ICU capacity and the deficit of knowledge, skills and competencies of professionals to work in intensive care<sup>(2-3)</sup>.

These elements may compromise the care provided and, consequently, increase mortality in ICUs. A study conducted in a university hospital in Rio de Janeiro, Brazil, with 355 patients, pointed to 23.4% of deaths during the period of hospitalization in the ICU<sup>(4)</sup>. Investigation in Taiwan, with a total of 3,451,157 patients admitted to the ICU, shows an overall mortality rate of 19.8%<sup>(5)</sup>. Data from a Polish multicenter study with 272 participants admitted to the ICU showed that overall survival rates reached 54.6%<sup>(6)</sup>.

In addition to high exposure to death, whether due to factors intrinsic to the underlying pathology, or to factors related to care, patients in ICU are usually more likely to acquire other morbidities. Research points to the acquisition of healthcare-related infections, immobility,

pressure injury and oral alterations<sup>(7)</sup>. A quantitative study conducted with a sample of 355 patients revealed an incidence rate of 9.3 adverse events per 100 patient-days<sup>(4)</sup>. These events may be related to the prolongation in the hospitalization time<sup>(4,7)</sup>.

It is important to emphasize that the Ministry of Health (MH), understanding this context, has been signaling the need to fulfill the adequate hospitalization time in ICU, in order to reduce such risks. In this regard, it established the goal of 4.5 to 5.3 days, as recommended by the Hospital Quality Control Program (CQH) and the Brazilian Association of Intensive Care Medicine (AMIB)<sup>(8)</sup>.

In view of this context, in the perspective of acting against the needs of ICU services, especially concerning the relationship between hospitalization time and clinical profile of inpatients, it becomes elementary to know the peculiarities of the service in which health professionals work. Thus, the aim is to contribute to the management of ICU services, especially regarding the action for sanitation of these problems. Thus, the study aims to identify the factors associated with longer stay of patients in the Intensive Care Unit.

## Method

This is a retrospective descriptive research, with a quantitative approach, linked to the study “Clinical Profile of Individuals Assisted by the

Nursing Team in University Hospital”, conducted by the Permanent Education Commission in Nursing (CEPE) from a University Hospital of Salvador, Bahia, Brazil. The research site consisted of this institution, which has an ICU for adult patients with 10 beds and a multidisciplinary team composed of doctors, nurses, nursing technicians, physiotherapist, speech therapist and psychologist.

The study included 105 adult patients, whose data were extracted from medical records after the end of hospitalization. The selection of these medical records was performed by consulting the hospital census in the Management Application for University Hospitals (AGHU). Data were collected from all patients hospitalized between June and August 2017, who met the following inclusion criteria: adult individuals of both sexes and with a hospitalization period of more than 24 hours. Exclusion criteria were: individuals whose medical records were not available in the hospital filing department.

The study variables referred to sociodemographic and clinical aspects of hospitalized patients. The sociodemographic aspects considered were sex, age, race/color, marital status, religion, level of education and origin. The clinical aspects were: reason for hospitalization in the ICU, comorbidities, life habits (alcohol consumption, cigarette), devices used during hospitalization, clinical outcome and length of hospitalization.

Data collection took place from September 2017 to April 2018, was guided by a specific instrument, built and validated by the researchers, containing the variables studied, being performed by a duly trained nursing professional.

After the data collection procedure, these were organized in the Microsoft Excel program and transported to the Stata program, version 12, for processing. Initially, a descriptive analysis was performed by means of frequency distribution to characterize the participants. The magnitude of

the association between the study variables was expressed in prevalence ratio (PR) and respective 95% confidence intervals (95% CI). The findings were analyzed in the light of the criteria of length of stay in hospital, recommended by the Ministry of Health and the Unified Health System (UHS), according to the Hospital Quality Control Program and the Brazilian Association of Intensive Care Medicine<sup>(8)</sup>.

The research is in line with the ethical criteria contained in Resolution n. 466/2012, of the National Health Council, which deals with issues related to research involving humans. In this sense, the project was submitted to the Research Ethics Committee (REC) of the *Hospital Universitário Professor Edgar Santos* and approved under Opinion n. 2.181.798/ 2017 and Certificate of Presentation of Ethical Assessment (CAAE): 65970917.3.0000.0049.

## Results

The participants were 105 patients. Of these, 58.1% were female; 49.5% adults, 44.7% elderly; 84.3% registered as black; 91.6% professed some religion; 65.7% had schooling up to the second grade; and 68.5% came from municipalities in the state of Bahia.

The main reasons for hospitalization in the ICU were: postoperative period 54.2%, sepsis 11.4% and cardiovascular problems 5.7%; most patients were hypertensive 53.3%, 19.0% diabetic and 14.2% had cardiopathy. Regarding life habits, 12.3% consumed alcoholic beverages and almost 10% were smokers. Most had less than six days of stay (72.3%).

As for the association between length of stay, lasting six days or more in the ICU and sociodemographic variables, no statistically significant associations were identified (Table 1). However, the largest stands out.

**Table 1** – Association between length of stay of ICU patients and sociodemographic variables. Salvador, Bahia, Brazil – 2018. (N=105)

Variables	n	Length of stay >5 days (%)	Prevalence Ratio	Confidence Interval (95%)
<b>Sex</b>				
Woman	61	27.8	1	
Man	44	27.2	0.97	(0.40 – 2.31)
<b>Age</b>				
Not elderly	58	32.7	1	
Elderly	47	21.2	0.55	(0.22 – 1.34)
<b>Race</b>				
Black	81	28.4	5.55	(0.68 – 4.68)
Not black	15	6.6	1	
<b>Marital status</b>				
Married/stable union	44	25.0	1	
Others	45	26.6	1.09	(0.42 – 2.82)
<b>Education (complete high school)</b>				
Yes	26	38.4	1	
No	49	20.4	0.41	(0.14 - 1.17)
<b>Origin</b>				
Salvador	33	33.3	1	
Other City	72	23.9	0.62	(0.25 – 1.55)

Source: Created by the authors.

In the bivariate analysis, among the variables studied, a positive association stands out, with statistical significance between hospitalization for clinical causes (PR=4.76 and 95%CI: 1.86 – 12.19), use of central venous access (PR=5.08

and 95%CI: 1.84 – 14.01), use of mechanical ventilation (PR=3.03 and 95%CI: 1.15 - 7.97), clinical outcome of death (PR=4.77 and 95%CI: 1.47 – 15.42) with longer length of stay (Table 2).

**Table 2** – Association between length of stay of ICU patients and clinical variables. Salvador, Bahia, Brazil – 2018. (N=105)

(continued)

Variables	n	Length of stay >5 days (%)	Prevalence Ratio	Confidence Interval (95%)
<b>Reason for hospitalization</b>				
Clinical	48	43.7	<b>4.76</b>	<b>(1.86 – 12.19)</b>
Surgical	57	14.0	1	
<b>Diabetes Mellitus</b>				
Yes	20	25.0	0.92	(0.29 – 2.84)
No	79	26.5	1	
<b>Arterial Hypertension</b>				
Yes	56	17.8	<b>0.36</b>	<b>(0.14 – 0.92)</b>
No	43	37.2	1	
<b>Cardiopathy</b>				
Yes	15	26.6	1.02	(0.29 – 3.55)
No	84	26.1	1	
<b>Alcohol consumption</b>				
Yes	13	38.4	1.76	(0.50 – 6.13)
No	65	26.1	1	
<b>Smoking</b>				
Yes	10	30.00	1.10	(0.25 – 4.72)
No	68	27.94	1	

**Table 2** – Association between length of stay of ICU patients and clinical variables. Salvador, Bahia, Brazil – 2018. (N=105) (conclusion)

Variables	n	Length of stay >5 days (%)	Prevalence Ratio	Confidence Interval (95%)
<b>Mechanical Ventilation</b>				
Yes	24	45.83	<b>3.03</b>	<b>(1.15 – 7.97)</b>
No	78	21.79	1	
<b>Central Venous Catheter</b>				
Yes	53	41.51	<b>5.08</b>	<b>(1.84 – 14.01)</b>
No	49	12.24	1	
<b>Mean Arterial Pressure</b>				
Yes	44	27.27	0.98	(0.40 – 2.36)
No	58	27.59	1	
<b>Foley Bladder Catheter</b>				
Yes	61	27.87	1.05	(0.43 – 2.56)
No	41	26.83	1	
<b>Outcome</b>				
Discharge	87	21.84	1	
Death	14	57.17	<b>4.77</b>	<b>(1.47 – 15.42)</b>

Source: Created by the authors.

## Discussion

The study pointed to the profile of patients hospitalized in the ICU studied, which, for the most part, were elderly women, registered as black and had some religion, with high school or higher education. This profile corroborates findings from other studies<sup>(9-10)</sup>.

Considering the length of stay in the ICU, 43.7% of the clinical patients and 14% of the surgical patients had a stay longer than five days, respectively, longer than that recommended by the Ministry of Health, through CQH and AMIB<sup>(8)</sup>. National and international studies have also pointed to means of hospitalization higher than the recommended interval of 4.5 to 5.3 days, with evidence of averages of up to nine days of hospitalization<sup>(5,7)</sup>.

In view of such evidence, it is relevant to indicate that there was a higher proportion of women, elderly, black and low education among patients with more than five days of hospitalization. This finding may be related to the set of vulnerabilities regarding health conditions related to this profile<sup>(11-12)</sup>, so that there may have been some interference in the length of hospitalization, although this type of association was not investigated in our study.

Concerning the cause linked to the time of hospitalization, there was a positive association between people whose cause was of a clinical nature, while when the underlying cause was of a surgical nature, they had shorter hospitalization time. Nevertheless, the clinical profile of the ICU patients studied showed that among the main reasons for hospitalization were the postoperative period, followed by sepsis and cardiovascular problems. Statistics from other countries show analogy between the reasons for hospitalization in critical units. A study conducted in Sudan with a sample similar to that of this study, which investigated 100 patients admitted to the ICU, indicated that sepsis and post-surgical management are among the three main causes of hospitalization<sup>(9)</sup>.

Such patients had mostly pathologies such as hypertension, diabetes *mellitus* or cardiopathies. The study in Sudan also pointed to this profile, revealing that the comorbidities identified during the hospitalization period were diabetes (60.9%) and hypertension (52.2%)<sup>(9)</sup>. Another study conducted in Goiás, Brazil, reveals cardiopathies among the underlying diseases of patients admitted to the ICU<sup>(11)</sup>.

It is important to note that the prognosis of these pathologies can be influenced by

lifestyle habits. Studies have already indicated that habits such as smoking and drinking alcoholic beverages are among the risk factors for cardiovascular diseases, hypertension and diabetes *mellitus*, and not abandoning these practices may aggravate such pathologies<sup>(13-14)</sup>. In this sense, it was possible to identify that 12.38% (n=13) consumed alcoholic beverages and almost 10% (n=10) were smokers. Percentages that call attention, given the possibility of worsening the clinical conditions of these pathologies due to these habits.

Even when it comes to possible aggravations related to the length of stay in the ICU, the study points to an association between longer length of stay and use of mechanical ventilation devices (MV) and central venous catheter (CVC). It is also important to point out that the research pointed out important prevalence regarding the use of different invasive devices, such as MV, CVC, Mean Arterial Pressure (MAP) and Foley Bladder Catheter (FBC). Research corroborates the exposure to some of these devices in patients admitted to the ICU, demonstrating the prevalence of the use of a delayed bladder catheter, endotracheal tube, tracheostomy and central venous catheter, respectively<sup>(10)</sup>.

Despite the potential of these devices for the recovery of individuals in aggravated health, their use can work as a risk factor for infections. A review study demonstrated that the use of catheters, mechanical ventilation, among other devices used by patients in ICU, significantly contribute to the onset of sepsis<sup>(15)</sup>. Another study corroborates this finding and complements that infections related to the use of invasive procedures are influenced by the variety of sites required, the high length of stay and the possibility of multiresistant bacteria<sup>(16)</sup>.

Among the clinical variables, statistical significance was found between the use of CVC and the longer length of stay. A study conducted with the elderly in the ICU, in northeastern Brazil, showed that the use of this device provides a considerable risk of infections due to direct access to the bloodstream, which may be interfered with over the time of use during hospitalization<sup>(10)</sup>.

Even faced with such risks, the study found that, among the patients studied, hegemonically, the discharge from the ICU was obtained as an outcome of the hospitalization period. This finding is promising given what has been pointed out in the national and international literature, which reveals higher percentages of mortality than this study, reaching up to 50% of deaths as an outcome<sup>(4-6)</sup>. This situation may be signaling the potential for recovery in the process of hospitalization in ICU.

The study is limited by its punctual character, since it was carried out in only one UH and in only three months, due to the difficulty of access to medical records, as well as the difficulty of access to information due to lack of registration, which resulted in loss of information.

Despite these limitations, this study contributes to highlight the profile of patients admitted to the ICU, as well as the factors associated with longer hospitalization, important parameters to promote strategies to reduce hospitalization in ICUs.

## Conclusion

The study showed an association between the longer ICU stay with clinical cause, use of central venous catheter, use of mechanical ventilation and clinical death outcome. Regarding the length of hospitalization, there was a closeness to the recommended by the Ministry of Health and the UHS, although the average is above the parameter established as a goal. Regardless of this finding, self-reported black people with low education had longer stay in the service.

Based on these findings, it is possible to direct preventive actions that contribute to reducing the time of hospitalization in ICU, such as infection control using aseptic techniques in the management of invasive devices. In addition, actions to prevent life habits, which can be disseminated to Primary Health Care scenarios, since basic diseases such as hypertension and diabetes can predispose patients to other diseases. In this context, the focus of these procedures on care and educational activities becomes relevant, in order to avoid worsening the health



of individuals and, therefore, prolonged time of hospitalization in ICU.

### Collaborations:

1 – conception and planning of the project: Anarilda Pimentel Costa, Rosana Santos Mota, Valdenir Almeida da Silva, Carolina Calixto de Souza Andrade and Susan Martins Pereira;

2 – analysis and interpretation of data: Anarilda Pimentel Costa, Rosana Santos Mota, Valdenir Almeida da Silva, Carolina Calixto de Souza Andrade and Susan Martins Pereira;

3 – writing and/or critical review: Anarilda Pimentel Costa, Rosana Santos Mota, Valdenir Almeida da Silva, Carolina Calixto de Souza Andrade and Susan Martins Pereira;

4 – approval of the final version: Anarilda Pimentel Costa, Rosana Santos Mota, Valdenir Almeida da Silva, Carolina Calixto de Souza Andrade and Susan Martins Pereira.

### References

- Cavalcanti AN, Pinto KDC, Maia EMC. Perfil de Pacientes Adultos em Unidades de Terapia Intensiva do Nordeste Brasileiro. *Rev Portal Saúde e Sociedade*. 2019;4(2):1113-25. DOI: <https://doi.org/10.28998/rpss.v4i2.6455>
- Barbosa IEB, Mota BS, Fonseca AR, Siqueira DSG, Melo FS, Lira FCF, et al. Fatores que difundem a assistência de enfermagem humanizada na unidade de terapia intensiva. *REAS*. 2021;13(4):e7082. DOI: <https://doi.org/10.25248/reas.e7082.2021>
- Barcellos LN, Santos LCA, Ribeiro WA, Paula E, Neves KC, Fassarella BPA, et al. Occupational risks to the health of nursing professionals in the neonatal ICU. *RSD*. 2022;11(6):e39711629270. DOI: [10.33448/rsd-v11i6.29270](https://doi.org/10.33448/rsd-v11i6.29270)
- Roque KE, Tonini T, Melo ECP. Eventos adversos na unidade de terapia intensiva: impacto na mortalidade e no tempo de internação em um estudo prospectivo. *Cad Saúde Pública*. 2016;32(10):e00081815. DOI: [10.1590/0102-311X00081815](https://doi.org/10.1590/0102-311X00081815)
- Lai CC, Ho CH, Chang CL, Chen CM, Chiang SR, Chao CM, et al. Critical care medicine in Taiwan from 1997 to 2013 under National Health Insurance. *J Thorac Dis*. 2018;10(8):4957-65. DOI: [10.21037/jtd.2018.07.131](https://doi.org/10.21037/jtd.2018.07.131)
- Fronczek J, Polok KJ, Nowak-Kozka I, Włodarczyk A, Górka J, Czuczwar M, et al. Frailty increases mortality among patients ≥80 years old treated in Polish ICUs. *Anaesthesiol Intensive Ther*. 2018;50(4):245-51. DOI: [10.5603 / AIT.a2018.0032](https://doi.org/10.5603/AIT.a2018.0032)
- Moreira JB, Souza ICS. Complicações mais comuns em pacientes internados em terapias intensivas. *Rev Científica Unificosa* [Internet]. 2016 [cited 2018 Sep 26];8(1):252-7 Available from: <https://academico.univicoso.com.br/revista/index.php/RevistaSimpac/article/view/650/793>
- Brasil. Ministério da Saúde. Agência Nacional de Saúde Suplementar. Média de Permanência UTI Adulto [Internet]. Brasília (DF); 2013 [cited 2018 May 15]. Available from: <https://www.gov.br/ans/pt-br/arquivos/assuntos/prestadores/qualiss-programa-de-qualificacao-dos-prestadores-de-servicos-de-saude-1/versao-anterior-do-qualiss/e-efi-07.pdf>
- Sulieman H, El-Mahdi W, Awadelkareem M, Nazer L. Characteristics of Critically-Ill Patients at Two Tertiary Care Hospitals in Sudan. *Sultan Qaboos Univ Med J*. 2018;18(2):e190-e5. DOI: [10.18295 / squmj.2018.18.02.011](https://doi.org/10.18295/squmj.2018.18.02.011)
- Sousa ÁFL, Queiroz AAFLN, Oliveira LB, Moura LKB, Andrade D, Watanabe E, et al. Deaths among the elderly with ICU infections. *Rev Bras Enferm*. 2017;70(4):733-9. DOI: [10.1590/0034-7167-2016-0611](https://doi.org/10.1590/0034-7167-2016-0611)
- Castro RR, Barbosa NB, Alves T, Najberg E. Perfil das internações em unidades de terapia intensiva adulto na cidade de Anápolis – Goiás – 2012. *Rev gest sist saúde*. 2016;5(2):115-24. DOI: [10.5585/rgss.v5i2.243](https://doi.org/10.5585/rgss.v5i2.243)
- Barbosa KTF, Oliveira FMRL, Fernandes MGM. Vulnerability of the elderly: a conceptual analysis. *Rev Bras Enferm*. 2019;72(Suppl 2):337-44. DOI: [http://dx.doi.org/10.1590/0034-7167-2018-0728](https://dx.doi.org/10.1590/0034-7167-2018-0728)
- Lunkes LC, Murgas LDS, Dorneles EMS, Rocha CBM, Machado GJ. Fatores socioeconômicos relacionados às doenças cardiovasculares: uma revisão. *Hygeia*. 2018;14(28):50-61. DOI: <https://doi.org/10.14393/Hygeia142804>
- Sousa TF, Ferreira MS, Santos SFS, Fonseca SA, Barbosa AR, Fonseca SCF. Fatores de risco cardiovasculares em universitários de uma instituição de ensino superior pública do Brasil.

- Rev Ciênc Saúde. 2021;11(4):78-85. DOI: <https://doi.org/10.21876/rcshci.v11i4.1170>
15. Luz Filho CA, Marinho CMM, Santos MDP. Fatores de risco em pacientes com sepse em unidades de terapia intensiva: uma revisão integrativa. REAS. 2019;(19):e208. DOI: <https://doi.org/10.25248/reas.e208.2019>
16. Sousa MAS, Nascimento GC, Bim FL, Oliveira LB, Oliveira ADS. Infecções hospitalares relacionadas a procedimentos invasivos em unidades de terapia intensiva: revisão integrativa. Rev Prev Infecç Saúde [Internet]. 2017 [cited 2019 Apr 07];3(3):49-58. Available from: <http://www.ojs.ufpi.br/index.php/nupcis/article/view/5848>

Received: March 11, 2021

Approved: September 5, 2022

Published: November 7, 2022



The *Revista Baiana de Enfermagem* use the Creative Commons license – Attribution -NonComercial 4.0 International.

<https://creativecommons.org/licenses/by-nc/4.0/>

This article is an Open Access distributed under the terms of the Creative Commons (CC BY-NC). This license lets others remix, adapt and create upon your work to non-commercial use, and although new works must give its due credit and can not be for comercial purposes, the users do not have to license such derivative works under the same terms.