Revista de Enfermagem UFPE On Line
ISSN:1981-8963

J Nurs UFPE on line.
2021; 15: e245947
DOI: 10.5205 / 1981-8963.2021.245947
https://periodicos.ufpe.br/revistas/revistaenfermagem

# KNOWLEDGE OF EMERGENCY NURSES ABOUT A SEPSIS CLINICAL PROTOCOL
# CONHECIMENTO DE ENFERMEIROS EMERGENCISTAS ACERCA DO PROTOCOLO CLÍNICO DE SEPSE
# CONOCIMIENTO DE LOS ENFERMEROS DE URGENCIAS SOBRE EL PROTOCOLO CLÍNICO DE LA SEPSIS

*Deysianne Ferreira da Silva*[1], *Maria Hellena Ferreira Brasil*[2], *Geovana Cristiane Viana Santos*[3], *Keyth Sulamitta de Lima Guimarães*[4], *Fabiana Maria Rodrigues Lopes de Oliveira*[5], *Natalia Pessoa da Rocha Leal*[6], *Gabriela Lisieux Lima Gomes*[7], *Keylla Talitha Fernandes Barbosa*[8]

**ABSTRACT**

***Objective*:** to identify the professional profile and the knowledge of nurses from an emergency care unit regarding a sepsis clinical protocol. ***Method*:** a quantitative descriptive study was carried out with a sample of 20 nurses. Data were collected through a semi-structured questionnaire with objective questions addressing the sociodemographic characterization and knowledge of these nurses regarding a sepsis clinical protocol. Data were analyzed in Excel 2010. ***Results*:** there was a predominance of female participants, nurses with formal training on intensive and emergency care, and nurses with more than three years of professional experience. Regarding the level of knowledge about sepsis management, the participants answered correctly to 85% of the questions on vasopressors use and blood culture, and to 45% of the questions on the recommended one-hour bundle. A total of 55% of the participants presented the minimum knowledge about the initial measures such as fluid resuscitation, hyperlactatemia, use of antimicrobials in septic patients, and laboratory tests. ***Conclusion***: although a highest level of training has been found, the knowledge about a sepsis identification protocol was unsatisfactory and limited, requiring improvement.

***Descriptors*:** Knowledge; Sepsis; Emergencies; Nursing; Clinical Protocols; Nurse Practitioners.

**RESUMO**

***Objetivo*:** identificar o perfil profissional e o conhecimento de enfermeiros emergencistas acerca do protocolo clínico de sepse, em uma Unidade de Pronto Atendimento. ***Método*:** estudo quantitativo, tipo descritivo, com amostra composta por 20 enfermeiros (as). Coletaram-se os dados por meio de questionário semiestruturado, abordando-se a caracterização sociodemográfica e o conhecimento destes profissionais acerca do protocolo clínico para pacientes com sepse, por meio de questões objetivas. Analisaram-se os dados no *Excel* 2010. ***Resultados*:** prevaleceram

profissionais do sexo feminino, especialistas em Terapia Intensiva e Urgência e Emergência, com mais de três anos de experiência profissional. Identificaram-se, quanto ao nível de conhecimento sobre o manejo da sepse, 85% de acerto sobre a utilização de vasopressores e coleta de hemoculturas, 45% acerca do *bundle* de uma hora preconizado e 55% apresentaram o conhecimento mínimo sobre as medidas iniciais, como ressuscitação volêmica, hiperlactemia, uso de antimicrobianos em pacientes sépticos e exames laboratoriais. ***Conclusão***: embora o maior nível de formação tenha sido de especialistas em Urgência e Emergência, o conhecimento acerca do protocolo de identificação da sepse foi insatisfatório e restrito, requerendo-se aprimoramento.

***Descritores*:** Conhecimento; Sepse; Emergência; Enfermagem; Protocolos Clínicos; Profissionais de Enfermagem.

**RESUMEN**

***Objetivo:*** identificar el perfil profesional y el conocimiento del enfermero de urgencias sobre el protocolo clínico de la sepsis, en una Unidad de Urgencias. ***Método:*** estudio cuantitativo, descriptivo, con una muestra de 20 enfermeros (as)s. Los datos fueron recolectados a través de un cuestionario semiestructurado, abordando la caracterización sociodemográfica y el conocimiento de estos profesionales sobre el protocolo clínico para pacientes con sepsis, a través de preguntas objetivas. Los datos fueron analizados en Excel 2010. ***Resultados:*** predominaron mujeres profesionales, especialistas en Cuidados Intensivos y Urgencias y Emergencias, con más de tres años de experiencia profesional. Se identificó, en cuanto al nivel de conocimiento sobre el manejo de la sepsis, 85% de aciertos sobre el uso de vasopresores y recolección de hemocultivos, 45% sobre el bundle de una hora recomendado y 55% presentó el conocimiento mínimo sobre las medidas iniciales como reanimación de volumen, hiperlactemia, uso de antimicrobianos en pacientes sépticos y pruebas de laboratorio. ***Conclusión:*** aunque el nivel más alto de formación fue de especialistas en Urgencias y Emergencias, el conocimiento sobre el protocolo de identificación de la sepsis fue insatisfactorio y restringido, requiriendo mejora.

***Descriptores*:** Conocimiento; Sepsis; Urgencias Médicas; Enfermería; Protocolos Clínicos; Enfermeras Practicantes.

---

[1,2,3]Centro Universitário de João Pessoa/UNIPÊ. João Pessoa (PB), Brasil. [1]https://orcid.org/0000-0002-5130-8748 [2]https://orcid.org/0000-0002-0297-8956 [3]https://orcid.org/0000-0002-2052-6128

[4,5,6,7,8]Universidade Federal da Paraíba/UFPB. João Pessoa (PB), Brasil. [4]https://orcid.org/0000-0002-1315-6624 [5]https://orcid.org/0000-0002-5966-232X [6]https://orcid.org/

0000-0001-6404-5580 [7]https://orcid.org/0000-0002-7032-2035 [8]https://orcid.org/0000-0001-6399-002X

* Article extracted from the Undergraduate thesis titled << Knowledge of emergency nurses about a sepsis clinical protocol >>. Centro Universitário de João Pessoa/UNIPÊ, 2020.

**How to cite this article**
Silva DF, Brazil MHF, Santos GCV, Guimarães KSL, Oliveira FMRL, Leal NPR, et al. Knowledge of emergency nurses about a sepsis clinical protocol. J Nurs UFPE on line. 2021; 15: e245947 DOI: https://doi.org/10.5205/1981-8963.2021.245947

## INTRODUCTION

Sepsis is a systemic inflammatory response that causes organic dysfunction due to an imbalanced action of the immune system due to an infectious process caused by microorganisms present in the human body. This process generates aggravating conditions, resulting in circulatory and metabolic changes with a high probability of death, called septic shock.[1-2]

The clinical management of sepsis has become a major challenge for both professionals and public health since, since sepsis has a high incidence, mortality, and cost. Worldwide, it is reported that sepsis has a registered prevalence of 16.5% of deaths, corresponding to about 250 thousand cases.[3] At the national level, 600 thousand new cases of sepsis are estimated showing that this is a significant cause of mortality.[4]

For individuals affected by sepsis, it is understood that the first three hours define the prognosis, which can considerably reduce the probability of death.[5] It is understood that the early identification of sepsis occurs, mostly, in urgent and emergency services such as the Emergency Care Units (UPA in Portuguese), since these are considered as a gateway to cases of greater severity, thus becoming regulatory links for high-complexity beds.[6]

Finally, intensive care services are increasingly scarce, insufficient, and worrisome. Some factors influence the deficit of early regulation of the most severely affected patients, such as the financial demand for maintenance of healthcare services and remuneration of professionals, and the lack of equipment and structure.[6]

Therefore, the importance of identifying and early treating sepsis cases is highlighted to ensure patient survival. Since nurses provide direct care for patients at the bedside, these professionals have a great responsibility in identifying/reversing conditions. Thus, it is necessary to use standardized and specific assistance standards, routines, and clinical protocols.[3]

In 2004, the Latin American Sepsis Institute (ILAS in Portuguese) published guidelines and scientific evidence related to sepsis treatment. Through the guidelines, protocols for the care of

patients affected by this pathology have been unified, on a worldwide level, maintaining the offer of revised, updated and approved instruments for the entire community.[7]

ILAS[7] recommends that all patients fitting the sepsis protocol criteria must receive the one-hour bundle, according to the *Sepsis-3* new definitions, and composed of the following items: laboratory tests collection (gasometry and arterial lactate, complete blood count, creatinine, bilirubin, and coagulogram); collection of two blood cultures from different sites; prescription and administration of broad-spectrum antimicrobials; and fluid resuscitation in hypotensive patients (SBP <90 mmHg or MAP <65 mmHg).[1]

A longitudinal study carried out in the emergency ward of a university hospital has found that more than 50% of the surveyed patients had organ dysfunction detected in the first hour, which was related to the implementation of protocols – a positive strategy for improving the prognosis of these patients.[8]

In developing countries, the use of the quick Sequential Organ Failure Assessment Score (qSOFA) is common in the triage of patients. According to the ILAS,[7] the qSOFA score has no sensitivity for screening but offers good accuracy in predicting death risk. It is possible to use a severity indicator employing the Sequential Organ Failure Assessment Score (SOFA), which aims at the early identification of organ dysfunction without any other plausible explanation and with an infectious focus, aiming at the immediate and early implementation of the sepsis management protocol to reduce morbidity and mortality.[7]

The new guidelines proposed by the Society of Critical Care Medicine (SCCM) and the European Society of Critical Care Medicine (ESICM) recommend that all institutions have strategies for detecting patients with sepsis and institute programs to improve care quality based on well-defined indicators[9]. In this perspective, the need for the qualification of professionals working in emergency services is emphasized concerning the identification of sepsis, so that management is applied early increasing patient survival chances.

Given the above, there is a need for understanding the level of knowledge of emergency team members, so that the implementation of health actions including the creation and use of clinical protocols for nursing performance qualification occurs.

## OBJECTIVE

To identify the professional profile and the knowledge of nurses from an emergency care unit regarding a sepsis clinical protocol.

## METHOD

This is a quantitative descriptive study carried out in a UPA located in the municipality of João Pessoa (PB), Brazil, with 20 nurses working in the yellow and red wards, aged 18 years old or over, and currently working in the unit. Professionals who worked in other sectors or in the administrative sector of UPA, and those who were not working in the patients' assistance for at least one month before the interview were excluded.

The data collection was performed from March to April 2020, through a semi-structured questionnaire addressing sociodemographic data of the participants and knowledge (measured through objective questions) about the sepsis clinical protocol.

The statements proposed in the instrument were related to the clinical management of sepsis, including standardized procedures proposed by ILAS[7]. The following issues addressed in eight categories were investigated: initial measures; need for fluid replacement; time for application of the therapeutic protocol; blood pressure parameters; laboratorial tests requesting; blood cultures; antimicrobials; and hyperlactemia management. The procedures and conducts proposed in the ILAS[7] one-hour bundle were added to the categorical alternatives.

The application of the questionnaire was carried out by approaching the professionals in the work environment during the shift. Data collection and consent were carried out in the same moment.

After the application of the questionnaire, responses were classified into two levels of knowledge ("minimum" and "full"), based on the number of correct answers and errors, considering the provisions made in the ILAS one-hour protocol.[7] Full knowledge was considered as achieving a number of correct answers greater than 50% (two or more) in statements 2 and 6 about the initial measures recommended in the bundle, and the exams that must be requested in the first hour. Therefore, minimum knowledge was considered as achieving a score inferior to what has been mentioned above. Since the other statements contained only one correct answer, the criterion used in these cases was choosing only one option, based on the protocol.[7]

Data were organized in Excel 2010 for the quantitative analytical procedure that included descriptive statistics of the variables.

The study adhered to the recommendations of Resolution No. 466/12 of the National Health Council. The study project was approved by the Ethics and Research Committee of the Centro Universitário de João Pessoa under the Certification of Presentation for Ethical Appreciation (CAAE) No. 3.779.654 / 2019. The confidentiality of the data was followed, since the research participants were identified using numerical codes in a statistical spreadsheet.

## RESULTS

Table 1 shows the profile of the 20 professionals interviewed.

Table 1. Profile of participant nurses at the UPA. João Pessoa (PB), Brazil, 2020.

| Variables | n | % |
|---|---|---|
| Gender | | |
| Female | 19 | 95 |
| Male | 1 | 5 |
| Age (years) | | |
| 20-30 | 13 | 65 |
| 31-40 | 6 | 30 |
| 41-50 | 1 | 5 |
| Academic degree | | |
| Specialist | 17 | 75 |
| Bachelor | 3 | 15 |
| Time of experience (years) | | |
| 1 - 5 | 12 | 60 |
| 6 - 10 | 7 | 35 |
| > 10 | 1 | 5 |
| **Total** | **20** | **100** |

It was observed that most participants answered correctly to the question about the use of vasopressors in patients suffering from sepsis (full knowledge). The same result was obtained in relation to blood culture requesting, since participants achieved a percentage of correct answers superior to wrong answers. Full knowledge was identified regarding the recommended initial measures. Furthermore, a partial knowledge was observed in regard to the administration of volume resuscitation. The low percentage resulted from the service protocol, which recommends the implementation of treatment measures in one hour. Concerning the monitoring of lactate levels, the percentage of correct answers was inferior to the other items assessed.

It should be added that the interviewees showed minimal knowledge regarding the use of antimicrobials. Finally, an erroneous indication of laboratory tests that should be requested for the patients was found (Table 2).

Table 2. Knowledge assessment of participant nurses at the UPA. João Pessoa (PB), Brazil, 2020.

| Variables | Minimum Knowledge | | Full Knowledge | |
|---|---|---|---|---|
| | n | % | n | % |
| Use of vasopressors | 3 | 15 | 17 | 85 |

| | | | | |
|---|---|---|---|---|
| Blood culture requesting | 3 | 15 | 17 | 85 |
| Implementation of the three initial measures after the diagnosis of sepsis | 11 | 55 | 9 | 45 |
| Administration of volume resuscitation to patients with sepsis | 10 | 50 | 10 | 50 |
| Protocol application time | 11 | 55 | 9 | 45 |
| Hyperlactemia management | 12 | 60 | 8 | 40 |
| Antimicrobials use | 13 | 65 | 7 | 35 |
| Laboratory test requesting | 15 | 75 | 5 | 25 |

## DISCUSSION

This study showed a predominance of young female nurses in an emergency care service in João Pessoa, Brazil, with more than three years of professional experience. This socio-demographic profile corroborates other investigations with the same design among the Brazilian professionals investigated.[10-2]

The average age of the participants was 33.15 years (middle age), corroborating with a study carried out with nurses from four public hospitals, in which a low percentage of participants with extreme ages (young and elderly) was observed.[10]

A higher percentage of nurse with a specialist degree was also observed, with emphasis on Intensive Care and Emergency, a condition considered essential for professional performance, since it guarantees quality assistance to the population. It is known that formal training is a great ally of professional success, being present in 100% of those surveyed in an analytical study carried out in a large hospital – a value considered positive.[13]

The association of age with the number of specialization courses is justified by the early training of nursing professionals, as they do not yet have a precise definition as to their performance in the labor market, thus fostering a greater number of specializations during midlife, as demonstrated in this research. In a study conducted nationwide with active nursing professionals, the predominance of complete and ongoing postgraduate degrees in middle-aged professionals was also observed.[11]

It is understood that the length of experience positively strengthens the knowledge of professionals, making them more experienced and safer in providing care.[13] A study conducted at a university hospital found that the professionals surveyed had five to ten years of professional experience.[12]

A predominance of correct answers found in the present study concerning the use of vasopressors in patients affected by sepsis has been found. In a documentary study,[18] medical records were analyzed to trace adherence to the clinical management proposed by Sepsis-3, identifying that 72% of patients required volume resuscitation and vasopressors.[14] The use of vasopressors is indicated in the one-hour bundle, when the Mean Arterial Pressure (MAP) is <65mmHg or the lactate level is greater than 4 mmol / L.[7]

The number of correct answers on the item about blood culture requesting in patients with sepsis was superior to the number of errors, which shows a satisfactory finding. It was concluded, in an exploratory study with nursing professionals at a university hospital, that 78.8% demonstrated knowledge about this item.[12] ILAS recommends[7] blood collection in two different sites preceding administration of antimicrobials. It is understood the need to start the intervention with antibiotic therapy in up to one hour aims at decreasing the load of microorganisms, as well as the regression of the inflammatory response in the human body. An increased risk of death is pointed out, in the literature, for patients when such intervention is delayed.[15]

There was a predominance of errors related to the implementation of the three initial measures after the diagnosis of sepsis, thus characterizing the minimum knowledge in relation to this subject. Initial measures are understood as interventions applied immediately, in case of suspicion or diagnosis of sepsis, considering lactate collection, blood culture, and the administration of antibiotic therapy as the highest priority measures, as presented in the one-hour bundle.[7] A study carried out through interviews with 38 nurses in three large hospitals has found that their knowledge about the sepsis protocol was not satisfactory in all nursing professionals, corroborating the findings of this study.[16]

There was evidence in the literature of lower levels of knowledge than necessary to provide quality care to patients suffering from sepsis.[10] In an audit carried out by a study in the United Kingdom, little knowledge on the part of nurses was identified, compromising, and bringing risks to the care provided.[17] The deficit is also revealed at the national level, reinforcing the need for investments in training and professional improvement.[18]

It should be noted, regarding the volume resuscitation recommended for patients with sepsis, that half of the sample obtained a correct answer. It was noted, in a study carried out with 30

nurses, to identify their knowledge about Sepsis-3, that 56.7% of the interviewees did not have proper knowledge about the theme.[18] Nurses must be able to identify the moment when this intervention is needed considering that bedside care is a nursing responsibility. The nurse is the bridge to provide communication in the patients' critical moments. It is emphasized that other attributions are also linked to this profession, such as scheduling fluid administration, and identifying patients' responses to medical interventions, aiming at a holistic and comprehensive care.[10]

In this study, the prevalence of errors in relation to the use of antimicrobials was found, configuring minimum knowledge and negative result for nursing professionals. Despite the fact that drug prescription is a medical responsibility, the nurse has a major role knowing the drug indication[19]. It is known that the early implementation of treatment directly influences the patient's survival. A study conducted in the United States (USA) has found that timely administration of antimicrobials reduced the rates of mortality from sepsis in an emergency department.[20]

In a study with a longitudinal design in the emergency department of a university hospital, it was found that the cases of sepsis and septic shock represented, respectively, 62.8% and 37.2%[8] of the total. In a study carried out in a UPA operating in a philanthropic hospital in the north of Minas Gerais, Brazil, 13.6% (17) of the patients had sepsis.[21]

Sepsis is related to a high mortality rate; therefore, SCCM and ESICM propose expanding the implementation of approaches used in the six and three-hour bundles for the one-hour bundle, in May 2018. This strategy aimed to avoid delay in treatment, culminating in more aggressive interventions that increase hospitalization time and costs for the health sector.[22]

The one-hour bundle provides a quick approach, prioritizing measures to measure lactate levels, collecting blood cultures, and initiating broad-spectrum antibiotics to reduce mortality rates. It is added that the decrease in the time of application of the interventions, in addition to providing for the early infusion of crystalloids, guides the administration of vasopressors, as long as volume resuscitation is not effective in cases of hypotension or increased lactate levels.[1,22]

The small number of nurses is based on the application of the one-hour bundle proposed by ILAS.[7] This bundle encounters resistance when proposed, being portrayed, by some institutions, as unrealistic. However, it is considered that the bundle has been implemented in hospitals in the USA and recognized as a valuable tool for improving the prognosis.[23] In Brazil, a prospective study shows that the bundle has not been successfully applied, not due to the scarcity of time (as argued in other countries), but due to the lack of material resources.[24]

Concerning the interval of assessment of lactate levels, it was observed that the number of errors was high, showing a low level of knowledge on the part of the investigated professionals regarding the monitoring of this marker. It is warned that arterial lactate levels above 4 mmol / L are considered indicators of organ dysfunction, and the nurse must recognize this condition and intervene in a timely manner.[22]

In patients suffering from sepsis, lactate is high due to some mechanisms such as tissue hypoperfusion, decreased clearance, increased glycolysis, and the stimulation of inflammatory mediators. The literature has reported that the evaluation of serum lactate levels has a low sensitivity and a high specificity.[9] It was noted, in a study conducted in Paraguay with 101 patients, that lactate represents a severity factor, presenting itself in high levels in about 70% of the patients who died.[25]

Concerning the assessment of the statements about the laboratory tests recommended by the one-hour bundle,[7] it was observed that most of the participants had a minimum knowledge. Nursing professionals must have knowledge about the necessary exams to be requested in case of sepsis (purpose of the exam and its normal parameters), aiming at comprehensive and holistic care to the patient.[18]

The one-hour bundle includes requesting exams before completing 60 minutes, including lactate levels, arterial blood gases, blood count, coagulogram, and blood culture from two different sites. It is also indicated, for the continuation of the evaluation, that the levels of glucose, urea, creatinine and bilirubin should be evaluated, as well as the follow-up of new tests for comparison with the first requested to evaluate the clinical evolution.[7]

It is known that there is a need to identify the presence of infection early, as well as the focus and the infectious agent, and organic dysfunctions to perform early interventions with a positive outcome. The multidisciplinary team is responsible for the early identification of clinical signs, such as increased or decreased temperature, altered heart and respiratory rates, blood pressure, capillary filling time, and decreased oxygen saturation linked to changes presented in laboratory tests, such as leukocyte variation, hyperbilirubinemia, thrombocytopenia, increased creatinine and hyperlactemia. This allows recognizing the patient's needs early to intervene without delay.[16]

As limitations of this study, the restriction of the research area and the small sample size are indicated, which hindered the statistical characterization of the variables and a better representation of the data. It is suggested, however, that studies like this serve as a basis for the early recognition of problems and the subsequent application of longitudinal research that supports the implementation of effective measures to improve health care.

## CONCLUSION

The research made it possible to elucidate the knowledge of nursing professionals about a sepsis clinical protocol with the purpose to characterize the levels of knowledge early in the face of the questions made to the respondents about clinical management and the necessary measures to meet the patients' needs.

Although a high level of training in Emergency has been found, knowledge about the sepsis protocol was unsatisfactory and limited, requiring improvement of these professionals.

In addition, it is necessary to develop longitudinal studies that address the role of nurses in the management of sepsis and its relationship with the patients' treatment and mortality. It is assessed, therefore, that investigating and defining the real involvement of nursing professional highlights its importance for the patients' assistance.

## CONTRIBUTIONS

All authors contributed equally to the design of the research project, collection, analysis, discussion of data, writing and critical review of the intellectual content, and to the approval of the manuscript's final version.

## CONFLICT OF INTERESTS

None to declare.

## REFERENCES


1. Singer M, Deutschman CS, Seymour CW, Shankar-Hari M, Annane D, Bauer M, et al. The Third International Consensus definitions for sepsis and septic shock (Sepsis-3). JAMA. 2016 Feb; 315(8):801-10. DOI: 10.1001/jama.2016.0287
2. Shankar-Hari M, Phillips GS, Levy ML, Seymour CW, Liu VX, Deutschaman CS, et al. Developing a new definition and assessing new clinical criteria for septic shock: for the Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). JAMA. 2016 Feb; 315(8):775-87. DOI: 10.1001/jama.2016.0289
3. Silva APRM, Souza HV. Sepsis: importance of early identification by nursing. R Pró-Uni [Internet]. 2018 Jan/June [cited 2020 Apr 12];09(1):97-100. Available from: http://editora.universidadedevassouras.edu.br/index.php/RPU/article/view/1266
4. Instituto Latino Americano de Sepse. Roteiro de implementação de protocolo assistencial gerenciado [Internet]. São Paulo: ILAS; 2019 [cited 2019 Aug 10]. Available from: https://ilas.org.br/assets/arquivos/ferramentas/roteiro-de-implementacao.pdf

5. Veras RES, Moreira DP, Silva VD, Rodrigues SE. Evaluation of a clinical protocol by nurses in sepse treatment. J Health Biol Sci. 2019 Apr/May; 7(3):292-7. DOI: 10.12662/2317-3076jhbs.v7i3.2466.p292-297.2019
6. Morr M, Lukasz A, Rubig E, Pavenstadt H, Kumpers P. Sepsis recognition in the emergency department – impact on quality of care and outcome? BMC Emerg Med. 2017 Mar; 17(11):01-8. DOI: 10.1186/s12873-017-0122-9
7. Instituto Latino Americano de Sepse. Implementação de protocolo gerenciado de sepse. Protocolo Clínico. Atendimento ao paciente adulto com sepse / choque séptico [Internet]. São Paulo: ILAS; 2018 [cited 2019 Aug 10]. Available from: https://www.ilas.org.br/assets/arquivos/ferramentas/protocolo-de-tratamento.pdf
8. Sanches CT, Albanese SPR, Moraes URO, Grion CMC, Kerbauy G, Dessunti EM. Sepsis: assessment of healthcare quality in an urgency and emergency unit. Ciênc Cuid Saúde. 2020 Feb; 19:e48588. DOI: 10.4025/cienccuidsaude.v19i0.48588
9. Rhodes A, Evans LE, Alhazzani W, Levy MM, Antonelli M, Ferrer R. et al. Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016. Intensive Care Med. 2017 Jan; 43(3):304-77. DOI: 10.1007/s00134-017-4683-6
10. Garrido F, Tieppo L, Pereira MDS, Freitas R, Freitas WM, Filipini R, et al. Actions of nurses in early identification of systemic changes caused by severe sepsis. ABCS Health Sci. 2017 Apr; 42(1):15-20. DOI: 10.7322/abcshs.v42i1.944
11. Machado MH, Aguiar Filho W, Lacerda WF, Oliveira E, Lemos W, Wermelinger M, et al. Características gerais da enfermagem: o perfil sócio demográfico. Enferm foco [Internet]. 2016 Feb [cited 2020 Apr 27];7(2):10-4. Available from: http://revista.cofen.gov.br/index.php/enfermagem/article/view/686/296
12. Silva TTSC, Rodrigues JLN, Amaral GP, Peixoto Júnior AA. Nursing knowledge about sepsis: a study in a university hospital in Fortaleza/Ceará. Rev Med UFC. 2017 Sept/Dec; 57(3):24-9. DOI: 10.20513/2447-6595.2017v57n3p24-29
13. Miranda AP, Silva JR, Duarte MGL. The knowledge of the nurse in the sepse protocol in an emergency service of a big public hospital. Nursing (São Paulo) [Internet]. 2019 Apr [cited 2020 Apr 29];22(251):2834-8. Available from: https://pesquisa.bvsalud.org/portal/resource/pt/biblio-998203
14. Pulzi Júnior SA, Ferraz RRN, Lapchik MS. Using tracer condition methodology to evaluate the assistential process offered to patients with severe sepsis and septic shock. Rev Gest Sist Saúde

[Internet]. 2017 May/Aug [cited 2020 Apr 12]; 6(2):114-123. Available from: http://www.revistargss.org.br/ojs/index.php/rgss/article/view/308/206

15. Cruz LL, Macedo CC. Epidemiological Profile of Sepsis in reference hospital in the interior of Ceará. Id on Line Multidisc Psychol J. 2016 Feb; 10(29):71-99. DOI: 10.14295/idonline.v10i1.385

16. Ribeiro JA, Gonçalves MS, Pereira GCS. Nurse actions in sepse's early identification. Enferm Rev [Internet]. 2019 Aug [cited 2020 June 06]; 22(2):27-40. Available from: http://periodicos.pucminas.br/index.php/enfermagemrevista/issue/view/1132

17. Robson W, Beavis S, Spittle N. An audit of ward nurses knowledge of sepsis. Nurs Crit Care. 2007 Apr/May; 12(2):86-92. DOI: 10.1111/j.1478-5153.2007.00210.x

18. Goulart LS, Ferreira Júnior MA, Sarti ECFB, Sousa AFL, Ferreira AM, Frota OP. Are nurses updated on the proper management of patients with sepsis? Esc Anna Nery Rev Enferm. 2019 Aug; 23(4): 01-6. DOI: 10.1590/2177-9465-EAN-2019-0013

19. Pedrosa KKA, Oliveira SA, Machado RC. Validation of a care protocol for the septic patient in the Intensive Care Unit. Rev Bras Enferm. 2018 May/June; 71(3):1106-14. DOI: 10.1590/0034-7167-2017-0312

20. Shah T, Sterk E, Rech MA. Correspondence to 1-hour bundle, an updated version of 3-hour bundle. Am J Emerg Med. 2018 July; 37(3):544-5. DOI: 10.1016/j.ajem.2018.07.037

21. Moraes DS, Cordeiro NM, Fonseca ADG, Souza LPS, Silva CSO, Lopes JR. Factors associated with prolonged inpatient admissions by the urgency and emergency. Rev Universidade Vale do Rio Verde. 2017 Aug/Dec; 15(2):680-91. DOI: 10.5892/ruvrd.v15i2.3770

22. Cárnio EC. New perspectives for the treatment of the patient with sepsis. Rev Latino-Am Enfermagem. 2019 Jan; 27:e3082. DOI: 10.1590/1518-8345.0000.3082

23. Lehman KD. Update: Surviving Sepsis Campaign recommends Hour-1 bundle use. Nurse Pract. 2019 Apr; 44(4):10. DOI: 10.1097/01.NPR.0000554123.08252.ae

24. Taniguchi LU, Azevedo LCP, Bozza FA, Cavalcanti AB, Ferreira EM, Carrara FSA, et al. Availability of resources to treat sepsis in Brazil: a random sample of Brazilian institutions. Rev Bras Ter intensiva. 2019 May; 31(2):193-201. DOI: 10.5935/0103-507X.20190033

25. Benitez JT. Value of serum lactate as a prognostic factor for mortality in patients with sepsis. Rev Virtual Soc Parag Med Int. 2017 Sept; 4(2):11-8. DOI: 10.18004/rvspmi/2312-3893/2017.04(02)11-018

**Correspondence**
Deysianne Ferreira da Silva
Email: dey13jp@hotmail.com

Submission: 05/29/2020
Accepted: 12/21/2020