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ORIGINAL ARTICLE

Adherence to the sepsis protocol by nurses in the intensive care unit

Adesão do protocolo de sepse pelo enfermeiro na unidade de terapia intensiva

Adhesión al protocolo de sepsis por parte del personal de enfermería en la unidad de cuidados intensivos

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ABSTRACT

Objective: To identify nurses' knowledge and adherence to the sepsis protocol in an Intensive Care Unit in the public health network. **Methods:** This is a qualitative research, of an interpretative nature. The study population was composed of nurses who worked in the Intensive Care Unit caring for patients with sepsis, ending in July 2023. The professionals responded to the semi-structured questionnaire through a recorded interview, transcribed and revealed by the application of the Content Analysis technique proposed by Bardin. **Results:** Of the 21 nurses interviewed, the majority were female, aged 31 to 59, with less than 5 years of training and some postgraduate qualifications. Two subcategories can be seen, represented by knowledge of the protocol and misinformation. **Conclusion:** The results show the role of nurses as a fundamental part in the management and execution of the sepsis protocol.

Descriptors: Sepsis; Clinical Protocols; Intensive Care Units; Nursing, Team; Nursing Care.

RESUMO

Objetivo: Identificar o conhecimento e a adesão dos enfermeiros ao protocolo de sepse em uma Unidade de Terapia Intensiva da rede pública de saúde. **Métodos:** Trata-se de uma pesquisa qualitativa, de natureza interpretativa. A população de estudo foi composta por enfermeiros (as) que atuavam em Unidade de Terapia Intensiva no cuidado de pacientes com sepse, envolvendo o período de julho de 2023. Os profissionais responderam ao questionário semiestruturado por meio de entrevista gravada, transcrita e analisada pela aplicação da técnica de Análise de Conteúdo proposta por Bardin. **Resultados:** Dos 21 enfermeiros entrevistados, a maioria era do sexo feminino, de 31 a 59 anos, com menos de 5 anos de formação e com alguma pós-graduação. Vislumbram-se duas subcategorias, representadas pelo conhecimento do protocolo e a desinformação. **Conclusão:** Os achados mostram a atuação do enfermeiro como parte fundamental no manejo e na execução do protocolo de sepse.

Descritores: Sepse; Protocolos Clínicos; Unidades de Terapia Intensiva; Equipe de enfermagem; Cuidados de enfermagem.

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RESUMEN

Objetivo: identificar el conocimiento y la adherencia de enfermeros al protocolo de sepsis en una Unidad de Cuidados Intensivos de la red pública de salud. **Métodos:** Se trata de una investigación cualitativa, de carácter interpretativo. La población de estudio estuvo compuesta por enfermeros que laboran en la Unidad de Cuidados Intensivos atendiendo a pacientes con sepsis, finalizando en julio de 2023. Los profesionales respondieron el cuestionario semiestructurado a través de una entrevista grabada, transcrita y revelada mediante la aplicación de la técnica de Análisis de Contenido. propuesto por Bardin. **Resultados:** De los 21 enfermeros entrevistados, la mayoría eran mujeres, con edades entre 31 y 59 años, con menos de 5 años de formación y algún título de posgrado. Se pueden observar dos subcategorías representadas por el conocimiento del protocolo y la desinformación. **Conclusión:** Los resultados muestran el papel del enfermero como parte fundamental en el manejo y ejecución del protocolo de sepsis.

Descriptores: Sepsis; Protocolos Clínicos; Unidades de Cuidados Intensivos; Grupo de Enfermería; Atención de Enfermería.

INTRODUCTION

Sepsis is a life-threatening organ dysfunction caused by a dysregulated systemic inflammatory response in its host, resulting in tissue damage to cells caused by infectious agents. Depending on the physiological and genetic characteristics and the capacity of the invading agents, the infection has the potential to cause septic shock and death. It is often undiagnosed in Intensive Care Units (ICUs), thus becoming a global public health problem.[1-2]

This organ dysfunction, applied to the concept of sepsis, is defined by variations in the Sequential Organ Failure Assessment (SOFA), which consists of a score that evaluates six organ systems: respiratory, hepatic, cardiovascular, neurological, renal, and circulatory. Each system is assigned an indicator from zero to four points, calculated within a 24-hour period. The higher the score, the more severe the organ dysfunction and the greater the risk of death.[1-3] Each system is assigned an indicator from zero to four points, calculated within a 24-hour period. The higher the score, the greater the risk of death. The SOFA score is zero in patients in whom organ dysfunction is nonexistent or unknown. Therefore, the presence of two points indicates a 10% mortality risk for hospitalized patients with suspected infection, due to the two- to 25-fold greater risk of death compared to patients with a SOFA score less than two points.[1]

During "Sepsis-3," the Systemic Inflammatory Response Syndrome (SIRS) criteria were disregarded for the diagnosis of sepsis. However, it is emphasized that the criteria are still important for

identifying infection and screening patients at risk for sepsis, but they are no longer required for the diagnosis of sepsis. Current efforts to combat the syndrome are based on early diagnosis and increasing awareness among healthcare professionals.[1-4]

In ICUs, sepsis is one of the main causes of death among hospitalized patients, as it is a sector that provides highly complex care to patients in critical health conditions who require specific treatment and care and who are often exposed to several invasive procedures.[5]

During the 70th World Health Assembly, sepsis was considered a health priority, given its high incidence, prevalence, and mortality. The estimated mortality rate by region in Brazil is 70% in the Central-West, 58.3% in the Northeast, 57.8% in the South, 57.4% in the North, and 51.2% in the Southeast. Between 20 and 30 million people are affected by this condition annually, representing an estimated 1,000 cases per hour and 24,000 cases per day. Sepsis stands out as the leading cause of death in non-cardiology ICUs.[6-4]

A survey of nurses in the United Kingdom revealed that knowledge about the primary management, signs, and symptoms of sepsis is insufficient, highlighting a critical situation regarding this topic, and therefore worthy of investment.[7] It is understood that insufficient knowledge among health professionals can have numerous causes, such as the lack of precise official definitions and adequate processes to aid early identification and make care planning faster and more effective. This, as well as the deficit in academic training.[8]

This approach emphasizes the importance of early identification and treatment of sepsis by health professionals, aiming at quality survival for the patient.[9] The most useful tools for controlling this problem are clinical protocols, which help standardize care, providing better direction of care, as well as reducing negative outcomes.[10-11]

Given the above, the objective of this study is to identify nurses' knowledge and adherence to the sepsis protocol in an Intensive Care Unit in the public health network.

MATERIALS AND METHODS

This is a qualitative, interpretive study. The study population consisted of 22 nursing professionals working in the Intensive Care Unit caring for patients with sepsis during the period from July 2023.

The saturation sample consisted of professionals working day and night shifts in an intensive care unit in Ponta Grossa, Paraná, Brazil. The institution is classified as public, offering services exclusively to patients enrolled in the Unified Health System (SUS) and providing 40 regular beds in the intensive care unit.

Nurses who had worked in the department for more than six months were included in the study. Exclusion criteria included those who were on vacation, those on sick leave, and those who did not express interest in participating. During the study, only one nurse was excluded for having worked in the department for less than six months on night shifts.

The information was obtained through a semi-structured instrument (Appendix 1) developed by the authors with questions that sought to characterize the population, such as sex, age, time since graduation and postgraduate studies, and questions to express their knowledge and adherence to the sepsis protocol, such as concept, treatments, access to the protocol, application, importance and routine.

The professionals completed the semi-structured questionnaire through a recorded and transcribed in-person interview. Participants were fully informed about the project's objectives and methodology and freely responded to the questions at a time and in a setting that was convenient for them. After agreeing to participate, they signed the Informed Consent Form (ICF), which guaranteed the confidentiality of their identities and the information collected.

The data were organized and analyzed using the Content Analysis technique proposed by Bardin.[12] This technique involves the systematic analysis of information about human behavior, whose function includes verifying hypotheses and uncovering the underlying content. This encompasses pre-analysis, material exploration, processing of results, inference, and interpretation.

This study was submitted to the Research Ethics Committee (CEP) of Cesumar University for review according to opinion no. 6,077,604 and through a Certificate of Presentation for Ethical Assessment (CAAE) no. 69694623.1.0000.5539, respecting the recommendations contained in Resolution no. 466/2012 of the National Health Council (CNS) which provides guidelines and regulatory standards for research involving human beings.

RESULTS

In the group of 21 nurses interviewed, the majority were female (61.9%), aged 31 to 59, with less than 5 years of training and some postgraduate studies, as shown in Table 1.

Table 1 –Profile of nurses working in Intensive Care Units (n=21). Ponta Grossa, Paraná, Brazil, 2023.

Variable		N (%)
Gender	Masculine	8 (38.1)
	Feminine	13 (61.9)
Age range	18 to 30 years old	8 (38.1)
	31 to 59 years old	12 (57.1)
	≥ 60 years	1 (4.8)
Time of operation	Less than 5 years	13 (61.9)
	From 5 to 10 years old	3 (14.3)
	More than 10 years	5 (23.8)
Postgraduate studies	Yes	17 (80.9)
	No	4 (19.1)

Source: The authors (2023).

Below (Table 1), the context units will be presented in detail, as well as their recording units and speeches exemplifying these.

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Table 1– Content Analysis: definition of context units with their respective recording units.

Context units	Registration units
Explanations for sepsis	
Specific and widespread signs and symptoms	
Recovery possibilities	
Knowledge and access to the hospital sepsis protocol	The protocol Disinformation
The nurse's role	
The importance of the protocol for nurses and patients	
Exceptions?	

Source: The authors (2023).

Explanations for sepsis

Regarding the concepts of sepsis, there were statements about organic disorder and infection.

"It is an organic disorder caused by an exaggerated reaction of the organism to the microorganism that invades the bloodstream and ends up releasing cytokines and immunoglobulins and as a result, the organism reacts in a somewhat accentuated way." (R2)

"It is the set of clinical signs and symptoms that result from an infection." (R5)

"Sepsis would be that generalized infection that is a process of the patient's own organism that presents some signs and symptoms that the infectious process is already progressively and alarmingly affecting the entire system, mainly the circulatory system, encompassing all the organs that may be undergoing some alteration and offering an imminent risk to the patient's life." (R21)

Specific and widespread signs and symptoms

Faced with a multifactorial and not yet fully understood condition, professionals expressed several symptoms.

"Hyperthermia, hypotension, mental confusion with the issue of delirium, vomiting, oliguria, respiratory dysregulation for both tachypnea and dyspnea and desaturation." (R1)

"Change in heart rate, changes in laboratory tests with increased or decreased leukocyte count, hypotension, temperature, change in level of consciousness." (R6)

"Temperature, hemodynamic instability, hypotension, hypertension, tachycardia, bradycardia, inflammatory signs." (R13)

Recovery possibilities

Antibiotic therapy was reported as an important point for the success of the

actions, in addition to corticosteroids and volume replacement.

“Corticosteroid to reduce the inflammatory response.” (R2)

“Antibiotic therapy mainly and normally vasoactive drugs and vasodilators.” (R15)

"There's the first-hour package, which involves collecting blood cultures, starting antibiotics as early as possible, having fluid replacement with crystalloid, which, if I'm not mistaken, is 30 ml/kg or something like that, and requesting routine tests like lactate, as far as I remember, that's it." (R20)

Knowledge and access to the hospital sepsis protocol

In this context unit, two subcategories can be seen, represented by knowledge of the protocol and misinformation.

a) The protocol

It demonstrates where the protocol is located and how to access it.

“Yes, the protocol is normally in folder H and is available on all computers in the hospital network.” (R2)

"Yes, I learned about the sepsis protocol at the hospital, and here in the ICU, we always use it. We always discuss it with the multidisciplinary team and follow the protocol flow. I don't know if it differs from institution to institution, but I believe the principle is the same, especially the earliest antibiotic therapy for the patient to get better." (R21)

Disinformation

Some professionals were unaware of the protocol's existence or reported that over time they no longer used it.

“I didn't know it existed in the ICU, I asked a nurse who showed me the system that has had it since 2015, so our protocol is quite outdated.” (R1)

“No.” (R5)

“It was discussed for a while, but I think it got lost in the middle of this process and we ended up leaving it aside, forgetting it, and not looking for this information as much.” (R13)

The nurse's role

Nurses report more the presence of the doctor in the application, but recognize some activities they perform.

“Honestly, in practice, I don't see it being applied. As nurses, we don't participate in the identification of sepsis in the ICU. In fact, it is done as a medical diagnosis, despite us knowing the signs and symptoms, we don't make this diagnosis, so I don't see this protocol being applied.” (R3)

“Just taking the protocol and going to the bedside and applying the protocol in practice, no, it's only during the visiting discussions that the doctor talks about the exams, checks the temperature, the patient's clinical condition, and

even has this look to suspect, but it's in conjunction with the doctor." (R6)

The importance of the protocol for the nurse and patient

The protocol is a safety measure and provides a good prognosis.

"It's greater security and you also know the correct sequence of treatment." (R8)

"It's a way for us to follow the same line of reasoning and not for each person to follow a method." (R14)

"Yes, the earlier a patient with sepsis is identified, the earlier the treatment will be, thus increasing the chance of the patient leaving the ICU safely and reducing mortality." (R16)

Exceptions?

The contradiction in the responses, for some all cases go through the protocol, others simply do not see this practice.

"I believe so because it is monitored by the CCIH." (R2)

"No, then I don't see the application of this protocol." (R3)

"Not by us (nurses) directly, but I think it's by doctors who prescribe antibiotics and apply them every day." (R16)

"Yes, because it is a mandatory notification and the hospital surveillance team must be notified." (R21)

DISCUSSION

Regarding the concept of sepsis, the most recently published consensus, "Sepsis 3," defines sepsis as the presence of life-threatening organ dysfunction secondary to the body's dysregulated response to infection. In this context, the same findings presented in the interviewees' responses demonstrate that the concept is widespread among professionals.[15] An exploratory, cross-sectional, descriptive study with a qualitative approach conducted in a highly complex tertiary public hospital showed that nurses have a limited understanding of what sepsis is, with gaps in their performance in detection, care, and treatment. Therefore, it is necessary for these professionals to seek to improve their knowledge on the subject in order to improve care practice.[13]

The new definitions bring positive points to the field, and for the first time, the definitions were based on literature data rather than just expert opinion. Furthermore, the SIRS criteria are no longer required for diagnosis, although they are important for patient screening,

including in quality improvement programs.[14]

Nurses working in intensive care units (ICUs) have direct contact with patients experiencing sepsis. Because they spend most of their time at the bedside, it is crucial that they are adequately prepared to identify signs and symptoms early and plan personalized care that takes into account the symptoms presented.[13]

These signs and symptoms, mentioned in the responses, involve specific and generalized characteristics, such as: increased body temperature, changes in heart rate, hypotension and mental confusion.[15]

Patients with sepsis exhibit changes in physiological parameters approximately eight hours before symptoms become evident. Delayed identification of sepsis can lead to a worsening of the patient's clinical course, resulting in septic shock and, in some cases, death.[16]

Professionals most frequently mentioned the use of antibiotics and corticosteroids as treatments for sepsis. According to the evidence-based Surviving Sepsis Campaign, sepsis management encompasses a set of actions, known as a care bundle, which should be implemented within the first hour after sepsis is identified. These actions, performed together, simplify the care process and positively influence the outcome. This initial bundle includes checking serum lactate levels to assess perfusion status, collecting blood cultures before initiating antimicrobial therapy, administering broad-spectrum antibiotics intravenously, initiating fluid replacement in patients with hypotension or lactate levels above twice the reference value, and using vasopressors during or after fluid replacement to maintain mean arterial pressure above 65 mmHg, monitoring the patient's progress.[15]

In an exploratory, bibliographic study with integrative analysis, the bundle associated with nursing through the nursing process was highlighted, a system used by nurses to organize nursing care, with the purpose of minimizing the harm caused by sepsis and highlighting that nursing works in the therapeutic support of the disease and uses its scientific knowledge for individualized and holistic care, in addition to being a legal support for the professional.[17]

Regarding knowledge about sepsis protocols, there is a notable lack of information among nurses regarding their existence and applicability. This scenario is similar to that presented in a descriptive, qualitative study conducted with nurses in the Intensive Care Unit (ICU) of a private

hospital in Fortaleza.[18] Protocols represent standards that support clinical care, following a sequence of actions and aiming for quality in the services provided. For this process to occur effectively, the engagement of managers and staff is essential, understanding the importance of these standards and the goal of providing safe care. This aspect has a direct impact on reducing the mortality rate and, consequently, decreasing the length of hospital stay.[18]

During the interviews, professionals mentioned difficulty identifying and understanding the institution's existing protocol due to a lack of ongoing sepsis education. They emphasized that, despite the barriers they encountered regarding this topic, they recognize the importance of nurses' existence and adherence to the protocol.

A study of 120 healthcare professionals at a top-tier university hospital found that most professionals who completed training had never participated in any continuing education program on sepsis.[19] The need to strengthen continuing education is evident, and professionals should be encouraged to actively participate to get the most out of these training opportunities.

Furthermore, it is the nurse's responsibility to seek scientific knowledge on the topic in relevant literature. The cooperative learning process can be an effective tool for strengthening knowledge and fostering strong interpersonal relationships.

There is a gap in understanding how nurses perform protocols, as many professionals reported following only what the medical team prescribes. According to a cross-sectional, analytical study conducted at a large university hospital in São Paulo with 41 nurses, it became clear that nurses play a fundamental role in initiating nursing interventions for patients. This includes considering the specificities of the infection, identifying sources of contamination, and addressing the risks of shock. Nurses must consider the quality of the materials used in care delivery and assess the conditions of the hospital environment.[21-9] Furthermore, nurses are responsible for conducting hemodynamic monitoring, collecting lactate, administering therapies related to the offending agent, administering fluid replacement, providing inotropic support, and monitoring the cognitive and respiratory systems.[21]

The relevance of the sepsis clinical protocol during intensive care unit (ICU)

activities, for both nurses and patients, is widely recognized. This is confirmed in a retrospective cohort study conducted in the Emergency Department of a hospital in Porto Alegre, Rio Grande do Sul. Adherence to the sepsis protocol brings several advantages, including cost reduction and a significant decrease in mortality rates. These are additional elements that positively contribute to the health of individuals after hospital discharge.[6]

Regarding the protocol's application, there were divergent responses from interviewees. Many believe the protocol should be applied to all patients with sepsis, while others believe otherwise. The ILAS (Latin American Institute of Sepsis) recommendations state that the sepsis clinical protocol should be open to all patients with suspected sepsis or septic shock.

It is important to emphasize that each healthcare institution will determine, based on its resources and specific circumstances, whether the protocol will be activated in cases of suspected infection, considering one or more organ dysfunctions in patients with suspected severe infection or in the presence of SIRS (Systemic Inflammatory Response Syndrome). The focus is always on prioritizing the most severe cases. The decision to initiate and follow the protocol is the responsibility of the medical team, taking into account the available information to make decisions about the feasibility of sepsis treatment.[22]

This study has limitations, the main one being the use of a data collection instrument created and validated by the authors themselves, which had not been applied in previous research. Replicating this study in different contexts could mitigate this limitation. Additionally, restricting the research to professionals from a single public teaching hospital reduces the generalizability of the results.

Despite the aforementioned limitations, this work is significant, as it contributes to a greater understanding of the importance of the protocol in the ICU, as well as greater adherence and understanding of the roles nurses play in relation to the protocol. Furthermore, it highlights the need for ongoing continuing education initiatives aimed at professional development. This will culminate in more effective, safer care, and improved care management.

CONCLUSION

We concluded that there are discrepancies in nurses' knowledge and adherence to the sepsis protocol. This highlights the urgent need for additional investment in the theoretical and practical training of these professionals, as well as in improving nurses' perception of the protocols implemented in their department. Approaches aimed at systematizing nurses' work within the sepsis protocol can increase the effectiveness of the proposed therapy, resulting in significant reductions in mortality and hospital costs.

The findings illustrate the importance of nurses as a vital element in sepsis management, whether by early identification of signs indicative of sepsis or by following the treatment protocol. Nurses' performance plays a crucial role in the care of septic patients, as it is through their guidance that the nursing team can provide quality, effective, and hassle-free treatment to the patient or coworker, thus increasing patient survival and reducing mortality risks. Much of the proposed therapy is their responsibility, requiring not only technical skill but also solid clinical reasoning.

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APPENDIX 1 – DATA COLLECTION INSTRUMENT

Nurse's initials: _____

Gender: ( ) Female ( ) Male

Age: _____ ( ) 18-30 years old ( )31-59 years old ( )>60 years old

Length of experience? _____ ( ) less than 5 years ( ) 5 to 10 years ( ) more than 10 years

Postgraduate: ( ) No ( ) Yes Which one?_____

1- What is the concept of sepsis?

2- Do you know how to identify the signs and symptoms of sepsis? What are they?

3- What are the main treatments for a patient with sepsis?

4- Did you know that there is a sepsis protocol available in the hospital's ICU? If you are aware of its existence, how did you access it?

5- As a nurse, have you ever applied this protocol? How?

6- Do you know how important this protocol is for the nurse and patient in their daily routine?

7- Is the protocol applied to all patients with sepsis? If not, why not?