



PREVENTION OF NOSOCOMIAL INFECTIONS IN INTENSIVE CARE UNIT: ANALYSIS OF PROFESSIONAL KNOWLEDGE

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ABSTRACT

The present study aimed to analyze the knowledge of medical doctors and registered nurses on the use of Bundles and safe practices for prevention of nosocomial infections. This was an observational and descriptive study through the quantitative approach. The sample was composed of 13 healthcare providers, 4 medical doctors and 9 registered nurses who work in a Intensive Care Unit. Regarding the knowledge of Bundles, 60% of the doctors did know anything about them, plus 20% did not answer the question. In contrast, 66,7% of the nurses affirmed knowledge. Concerning to the knowledge of healthworkers about caring without infections and reliability of Nosocomial Infection Control Committee and Patient Safety Core, 77,8% of nurses and 100% of doctors agreed that the ICU is the most likely place to the development of nosocomial infections. With regard to practices associated to the nosocomial infections prevention, this study demonstrated that healthworkers recognized that these ensure high levels of quality in the healthcare delivery.

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INTRODUCTION

Patient safety is crucial to improving the quality of health care around the world. Patientsafety is defined as being a preventive practice that attempts to reduce the adverse effects and injuries generated in the medical-hospital care process. (Rigobello; Deus, 2012). According to the numbers of researchescarried out in developed countries, at least one in 10 patients that receives some type of hospital care, ends up

suffering damage or injury resulted from healthcare providers called adverse events (AE) (REIS, 2013). In Brazil, the Ministry of Health established the Nacional Program for Patient Safety (NPPS) through the Portaria nº 529 de 01 de abril de 2013, which aims to contribute to the delevopment of safe practices in all healthcare facilities in the country (BRASIL, 2013a). Given that the ICU scenario is a conducive space for the occurrence of AE and aiming at reducing the rate of patient health risks in the ICU, the Institute for Healthcare Improvement (IHI) created the *Bundles*, with the objective of reducing hospital infection rates and minimizing the impact of mortality related to Healthcare Related Infections (IRAS)

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Table 1. Knowledge of Medical Doctors and Registered Nurses of the Intensive Care Unit at Hospital Universitário Alcides Carneiro about complications of the nosocomial infections. Campina Grande-PB, 2018

VARIABLES	N	%
Sepsis/Septic shock	7	26,0
Increased hospital stay	6	22,2
Worsening of prognosis/ death	5	18,5
Exposure of patients to microbial resistance by the use of several antibiotics	3	11,1
Systemic complication/ failures	3	11,1
More expenses for the hospital	2	7,4
Decreased patient survival	1	3,7

Source: Data of the research.

Table 2. Knowledge, attitudes and important practices to prevent respiratory, central venous catheterization and urinary tract infections performed by Medical doctors and Registered Nurses. Campina Grande-PB, 2018

VARIABLES	N	%
Pulmonary aspiration according to principles of biosafety	8	18,7
Reduction of Invasive Mechanical Ventilation time (daily wake up)	6	14,0
Raise the head of a bed 30° to 45°	5	11,6
Antisepsis before puncture (healthcare providers)	9	22,0
Perform puncture aseptically	8	19,5
Change dressing according to protocols	6	14,6
Perform bladder catheterization using aseptic technique	14	35,9
Keep collection bag below bladder level	4	10,2
Reduce the time of use of bladder catheter	4	10,2

Source: Data of the research.

during hospitalization, causing not only damages to the patient but also to their relatives. Bundles are defined as packages of actions to prevent some types of nosocomial infections acquired by the patient during their stay in the ICU, related to the use of mechanical ventilation (MV), central venous catheter (CVC) and continuous bladder catheterization (SVC) (SHIMABUKURO; PAULON; FELDMAN, 2014). In this context, the present study aimed to analyze healthcare providers' knowledge who work in ICU about *Bundles* and safe practices to prevent nosocomial infections in ICU environment.

MATERIALS AND METHODS

This is an observational and descriptive study with a quantitative approach. It was carried at the Hospital Universitário Alcides Carneiro (HUAC), in the city of Campina Grande, Paraíba. The sample was composed by 17 healthcare providers, 8 medical doctors (MD) and 9 registered nurses (RN) who work at the ICU in this referred hospital. From all of them, 3 refused to participate, remaining 14 participants (9 RNs and 5 MDs). It was included in the sample providers who wanted to participate and it was excluded those who were on vacation or license at the period of the data collection as well as those who did not want to be part of this research. The research was structured in two moments. The first one refers to the beginning, in which an invitation letter was given to the providers explaining the study and inviting them to participate. Soon after, those who agreed to participate answered a questionnaire with objective questions, which evaluated their knowledge about the factors that compromise patient safety in the ICU, as well as on the nosocomial infection prevention *Bundles*. The professionals were approached individually and privately. All the variables of the research instrument were transformed into quantitative variables. The database was built in the SPSS® (*Statistical Package for the Social Sciences* - version 20.0) and descriptive statistics were used (absolute distributions, percentages, mean and standard deviation).

The study followed the recommendations in the Resolution 466 of December 12, 2012, of the Conselho Nacional de Saúde, referring to research with human beings. The study was approved by the Research Ethics Committee of Universidade Federal de Campina Grande, Cajazeiras under the protocol number: 2.458.210. All the subjects presented consent to participate through the signing of the Informed Consent Term.

RESULTS

There was a predominance of the female gender in the sample (71.4%), 64.3% were RNs and 35.7% MDs. 57.1% were in the age group of 30 to 39 years. The average of time working in the ICU of 64.3% was between 1 to 10 years. When questioned about the knowledge on *Bundles*, 66.7% of the nurses claimed to have knowledge, 60% of the MDs did not know about them and 20% did not answer the question. Regarding their understanding of the *Bundles*, 42.9% of the participants did not respond, a very expressive number. The majority of them answered: 28.6% defined *Bundles* as packages of actions to prevent nosocomial infections, 14.3% affirmed as being a standardization of routines, 7.1% a mean of communication between professionals and 7.1% as a set of achieved outcomes. Concerning to the knowledge of health workers about caring without infections and reliability of Nosocomial Infection Control Committee (CCIH) and Patient Safety Core (NSP), 77.8% of nurses and 100% of doctors agreed that the ICU is the most prone place for the development of nosocomial infections. Regarding the actions developed by the NSP and CCIH to prevent nosocomial infections, 66.7% of the RNs and 60% of the MDs agreed that no action was taken to prevent infections. In addition, 77.8% of nurses and 80% of physicians reported having adequate knowledge to develop safe care. Another variable of significant value was the one about professional training on patient safety and nosocomial infection prevention, in which 66.7% of RNs and 60% of MDs said they did not have training in patient safety and how to prevent infections in the ICU. When they were asked why the ICU is more likely to develop nosocomial infections in patients, 28.6% of the professionals

answered that the clinical conditions leave them more vulnerable, the same percentage of professionals said that it is due to performing more invasive procedures, 7,1% related to the fact that the ICU is a closed sector, 7,1% noted that many patients are already admitted with some infection and 7,1% mentioned the proximity of the beds. The healthcare providers were also asked about the most prevalent infection in ICU, 92,8% answered. Between them, 78,6% reported that the nosocomial infections that more affect patients in ICU is the respiratory tract, 7,1% bloodstream infections and 7,1% urinary tract infection. Regarding the actions to fight infections in the ICU, the most significant results obtained were: 32,4% considered hand hygiene to be important, 23,5% pointed to the importance of using aseptic techniques in procedures and 8,8%, the correct use of antibiotics.

The Table 1 demonstrates the healthcare providers' knowledge about the complications of nosocomial infections in ICU, 26% of them agreed that sepsis/septic shock is one of the main causes of complications, 22,2% reported increased hospital stay. Table 2 shows the knowledge of health providers about attitudes and practices to prevent respiratory, CVC and urinary tract infections (UTI). Regarding to the prevention of respiratory infections, the variables that showed the greatest importance highlighted by the participants were: 18,7% pulmonary aspiration according to principles of biosafety, 14,0% reduction of invasive mechanical ventilation time with daily awakening and 11,6% keep the headboard raised between 30° to 45°. Concerning the prevention of CVC related infection, 22% of the providers reported the importance of antisepsis before puncture, 19,5% reported the importance of aseptic puncture and 14,6% reported also the dressing change according to protocol. Regarding the prevention of UTI due to the use of bladder catheter, 35,9% of the providers emphasized the performance of a aseptic procedure, 10,2% cited the importance of keeping the collection bag below the bladder level and 10,2% answered that reducing the time of SVD use reduces the risk of infection.

DISCUSSION

According to Machado *et al.* (2016), there is an association between age and sex in nursing. It is noted that nursing is a profession with a greater number of young professionals, aged between 30 and 40 years. Furthermore, as stated in Camelo (2013), the longer time of practice and formation can be considered as greater experience and maturity in caring for critical patients. As reported by Chicayban *et al.* (2017), there is a recommendation on the use of *bundles* to replace single prevention measures, since the use of protocol provides a significant improvement in both patient safety and patient care in the ICU, but for this to occur is necessary adherence and training of the healthcare providers. In regard to caring without infection, Abegg (2011) stated that critically ill patients admitted to the ICU have a greater predisposition to IRAS when compared to patients from other sectors. Thereby, the ICU is considered an environment more conducive to the development of infections. To Cyrino and Dell'Acqua (2012) the ICU has greater number of IRAS due to the diversity of injuries that afflicts the patients, as well as the use of high standard, advanced technology, the increase use of therapeutic resources, for example, biopsies, catheterizations, respiratory aspirations and the number of people who work in the unit. Through this research, it was possible to evidence the lack of basic information to the healthcare providers about the

measures of prevention and control of IRAS. The CCIH is responsible to normalize the procedures and behaviors through a regular epidemiological surveillance and it is also their responsibility to formulate a Nosocomial Infections Control Program (PCIH) with actions that reduce the occurrence and injuries caused by IRAS (GIAROLA *et al.*, 2012).

Regarding to the complications of ICU nosocomial infections, Ramalho Neto *et al.* (2015) stated that there is a higher risk of developing sepsis, septic shock in the ICU due to innumerable factors, such as the patient's underlying disease and its severity, its permanence in the unit and how long this stay can be debilitating, especially with regard to elderly patients. The development of bacterial resistance, invasive procedures, such as endotracheal intubation, requiring mechanical ventilation, intravascular catheterizations and the need for the bladder catheter associated with other procedures generate a fragility in the body of the individual, making it susceptible. Another expressive factor is related to hospitalization time. According to Sousa *et al.* (2016), the prolonged stay of patients in the ICU is due to the state in which they are found; in cases that tracheostomy or reintubation is required, the patient is subject to the use of mechanical ventilation (MV), resulting in a longer stay of the patient in the ICU. Similarly, the MV is associated to the high rates of pneumonia in the ICU. According to Silva, Nascimento and Salles (2012), raise the headbed between 30° to 45° is fundamental to avoid bronchoaspiration, specially in cases of patients with nasoenteral catheter. In addition to preventing bronchoaspiration, this measure also contributes to the improvement of tidal volume. As stated in Barreto *et al.* (2013), important practices to reduce the occurrence of CVC-related infections are the use of aseptic techniques by the professionals in charge of the insertion and their assistants, following the standards of hand hygiene and personal protective equipments.

The dressings performed for the coverage of CVC insertion must be made by sterile technique, the materials used should be free of microorganisms that can cause infection. In this way, it is imperative that the dressing remains adhered to the patient's skin, as it prevents contact of the catheter ostium with the ambient air (PEDROLO, DANSKI; VAYEGO, 2014). In this context, patients in intensive care are mostly also submitted to urinary tract catheterization for physiological monitoring. So, there is a direct relationship between the period of time that the bladder catheter stays on and the development of nosocomial infections. The greater the time of permanence with catheter, the greater are the chances to acquire bacteria and the probability to develop infection, even with the use of a closed drainage (SPERANCETA; OSELAME; OLIVEIRA, 2016). Besides that, Alves (2014) believes that nursing professionals should be careful not to hang the bag on the bed rail to prevent it from being accidentally lifted above the level of the bladder. The collection bag and the tubing are favorable means for the proliferation of bacteria. If this urine returns to the bladder, the development of infection is imminent. It was found during the study that medical professionals and nurses have knowledge about caring without infection. However, it was demonstrated the need for greater action by the CCIH and the NSP in order to promote actions that seek to prevent infections, ensuring a safe environment and assistance. In the context of the ICU, it is noted that despite all the technological resources that make it possible to recover the patient's health, it is an environment that does not always achieve good results in relation to care,

considering the numerous procedures to which individuals are submitted, reflecting in complications and worsening prognosis. It was also observed that the main infections that affect the patients are related to invasive procedures, mechanical ventilation, central venous catheter and bladder catheterization, being ports of entry for such infections. Regarding the measures associated to the prevention of these infections, the study showed that healthcare providers recognize that these practices ensure the quality of care. It is imperative that all professionals comply with measures to prevent infections because it was observed that not all of them were engaged and up to date with these specific demands.

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