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INFECTION IN PATIENTS UNDER ARTIFICIAL VENTILATION: UNDERSTANDING AND PREVENTIVE MEASURES ADOPTED BY NURSING STUDENTS

INFECÇÃO EM PACIENTES SOB VENTILAÇÃO ARTIFICIAL: COMPREENSÃO E MEDIDAS PREVENTIVAS ADOTADAS POR ESTUDANTES DE ENFERMAGEM

INFECCIÓN EN LOS PACIENTES POR VENTILACIÓN ARTIFICIAL: COMPRENSIÓN Y MEDIDAS PREVENTIVAS ADOPTADAS POR ESTUDIANTES DE ENFERMERÍA

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ABSTRACT

Objective: to investigate the understanding of nursing students about the prevention of infection in patients under artificial ventilation in the Intensive Care Unit (ICU). **Method:** an exploratory field study with a quantitative approach. 30 students participated. It was used a questionnaire to collect the data that were then processed and analyzed manually, from statistical software, with results shown in tables and figures. The research project was approved by the Ethics Committee in Research, with CAEE 0539.0.126.000-10. **Results:** 67% did not attend patients suffering from hospital infections. It was mentioned as preventive measures: 28 (24%), the education of the healthcare team, 10 (23%) cited the use of aseptic techniques, 9 (20.0%) say they do not know what actions should be taken. **Conclusion:** the study showed that the majority of the students cited as preventive measures the continuous education in service and the use of aseptic techniques. **Descriptors:** Nursing Students; Infection; Intensive Care Units.

RESUMO

Objetivo: investigar a compreensão de estudantes de enfermagem sobre a prevenção de infecção em pacientes sob ventilação artificial na Unidade de Terapia Intensiva (UTI). **Método:** estudo exploratório de campo com abordagem quantitativa. Participaram 30 estudantes. Utilizou-se de um questionário para coletar os dados que em seguida foram manualmente processados e analisados, apartir de software estatístico, os resultados estão expostos em tabelas e figuras. O projeto de pesquisa foi aprovado pelo Comitê de Ética em Pesquisa, com o CAEE 0539.0.126.000-10. **Resultados:** 67% não atenderam pacientes acometidos por infecção hospitalar. Mencionaram como medidas preventivas: 28 (24%) a educação da equipe de saúde, 10 (23%) citaram o uso de técnicas assépticas, 9 (20,0%) afirmam não saberem quais ações devem ser adotadas. **Conclusão:** o estudo evidenciou que a maioria dos estudantes citou como medidas preventivas a educação continuada no serviço e o uso de técnicas assépticas. **Descritores:** Estudantes de Enfermagem; Infecção; Unidades de Terapia Intensiva.

RESUMEN

Objetivo: investigar la comprensión de los estudiantes de enfermería en la prevención de la infección en pacientes sometidos a ventilación artificial en la Unidad de Cuidados Intensivos. **Método:** estudio exploratorio de campo con un enfoque cuantitativo. 30 estudiantes participaron. Se utilizó un cuestionario para recolectar datos que luego fueron manualmente procesados y analizados de software estadístico. Los resultados se muestran en las tablas y figuras. El proyecto de investigación fue aprobado por el Comité de Ética en Investigación, con CAEE 0539.0.126.000-10. **Resultados:** 67% no asistió a los pacientes que sufrieran de infecciones hospitalarias. Mencionado como medidas preventivas: 28 (24%), la educación del equipo de salud, 10 (23%) citó el uso de técnicas asépticas, 9 (20,0%) dicen que no saben qué acciones se deben tomar. **Conclusión:** el estudio mostró que la mayoría de los estudiantes citó como educación preventiva la educación continua en el servicio y el uso de técnicas asépticas. **Descriptores:** Estudiantes de Enfermería; Infección; Unidades de Cuidados Intensivos.

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INTRODUCTION

The nosocomial infection (NI) is an important public health problem since the creation of the first hospitals, even when there was no usable scientific knowledge and microbiology, as well as the principle of transmission of diseases. It is known that a large IH promotes health impact causing mortality often generated by invasive procedures for the diagnosis and treatment. Through this perspective, the transmission of microorganisms occurs through contact with the hands of professionals and patients by direct contact with the patient material or contaminated environment. Thus, nosocomial infections have become a major challenge for the professionals working in this area.¹

Conceptually, hospital infection is defined as an infection acquired after admission of the patient and that manifests itself during hospitalization or after discharge, when it can be related to hospitalization or hospital procedures.² Thus, in the mid-nineteenth century, the Hungarian surgeon Ignaz Philipp Semmelweis observed that the high rates of puerperal infection occurring in women after they have been treated by doctors who had conducted autopsies before. So, it was instituted a routine of hands hygiene with chlorine solution, managing to reduce infection rates from 11.4% to 1.3% in a period of seven months.³

It is important to note that the role of nursing has assumed the duties of prevention and control of contamination of the hospital environment, since the performance of Florence Nightingale to develop practice with epidemiological support for the prevention and control of infectious diseases and hospital infections, a pre-bacteriological, which resonates even today. The legacy of Florence points to health as resulting from the interaction of environmental factors, highlighting the need to consider them as indispensable in addressing the disease process and to promote quality of life. Nevertheless, in reality points to a scenario in which these aspects are not yet fully considered in the process of health work.⁵

It should be noted that the problem of hospital infection is more serious in the Intensive Care Unit (ICU) because this environment, despite the highly specialized technology, the patient is more exposed to the risk of contamination, given their clinical condition, risk factors predisposing and variety of invasive procedures routinely performed.⁶

With respect to these invasive procedures, monitoring of critically ill patients who require ongoing support for the preservation of its vital functions may be undergoing endotracheal intubation, mechanical ventilation or tracheostomy, which harm the defense mechanisms of the respiratory tract and can cause Pneumonia Ventilator-Associated (VAP). In this context, the ventilator is an artificial form of treatment used in the ICU to maintain oxygenation and / or ventilation in critically ill patients who develop respiratory failure.⁶ In Brazil, although there is no national data and multicenter studies show the VAP is the most common infections in the ICU.⁷

Therefore, the ICU is characterized as a unit of high risk of infection, especially for patients on mechanical ventilation. Furthermore, contamination of these patients can often occur due to failures in the implementation of procedures generated by errors or even negligence on the part of the health team in performing preventive measures for infection.

This study is justified by the high frequency of respiratory tract infection in ICU patients and the feeling of inability of students to cope with the situation. Such problems were perceived from practical experience in supervised undergraduate course in Nursing in a teaching hospital of the city of João Pessoa.

Development of this study came from the following questions: What is the understanding of nursing students on the prevention of infection in patients under artificial ventilation in the Intensive Care Unit? What preventive measures are used by nursing students in cases of patients under mechanical ventilation?

Based on the above, the research aims to screen:

- Investigate the understanding of nursing students about prevention of infection in patients under artificial ventilation in the Intensive Care Unit
- To investigate the preventive measures used by nursing students to assist patients under mechanical ventilation.

METHOD

A study of exploratory and field delineation with quantitative approach. The exploratory research mainly aim to develop, clarify and modify concepts and ideas, with a view to formulating problems more accurate searchable or hypotheses for further studies.⁸ While research field is one in which the researcher, through questionnaires, interviews

, verbal protocols, observations, etc..., collects its data by investigating respondents in their environment where they are.⁹

The study was conducted at the Center for Health Sciences (CCS) at the Federal University of Paraiba (UFPB), Campus I, João Pessoa / Paraiba / Northeast Brazil. The population was composed by students of the Bachelor of Nursing. As inclusion criteria we considered students who submit registration active on the 8th and 9th periods. Exclusion criteria were: students who were not in academic activities at the time of the survey and to submit the age of 18 years old.

The study sample was consisted of 30 students, eight in the 8th and 22 from the 9th period. To obtain empirical material, a questionnaire was used. Data were processed and analyzed manually from statistical software, and the results are shown tables and figures.

This study was approved by the Ethics and Research of the University Hospital Lauro Wanderley and is registered on the protocol No. 689/10 (CAAE No. 0539.0.126.000-10). After clarification of the research and obtaining consent for participation, students were informed about the study objectives. The whole procedure of the research was conducted in compliance with the provisions of Resolution 196/96 of the National Health

Council, which guides the research involving humans, directs the ethical principle of autonomy, respect and dignity, and defends the vulnerability of the participant search.

RESULTS AND DISCUSSION

The age group of nursing students selected for the study was of 19 to 25 years old. At this stage of life, which extends up to 39, the individual has high biological capacity and capability for the reproduction of knowledge. It is precisely in this period that competitions and opportunities appear, for building material.¹¹

Regarding gender, 28 females predominated (93.3%). This is a characteristic of nursing, explained by its origin, with emphasis on ethical and moral values..In the Middle Age emerged own local assistance for the poor, the suffering and the excluded diseases. These places were dirty and care were provided by women, whose concerns were greatest spiritual healing and eternal salvation. These locations were later called the hospital and in the century XVII medicine began to use it as a place of healing and training in healthcare. It was at this stage that the doctor has become the central figure.¹²

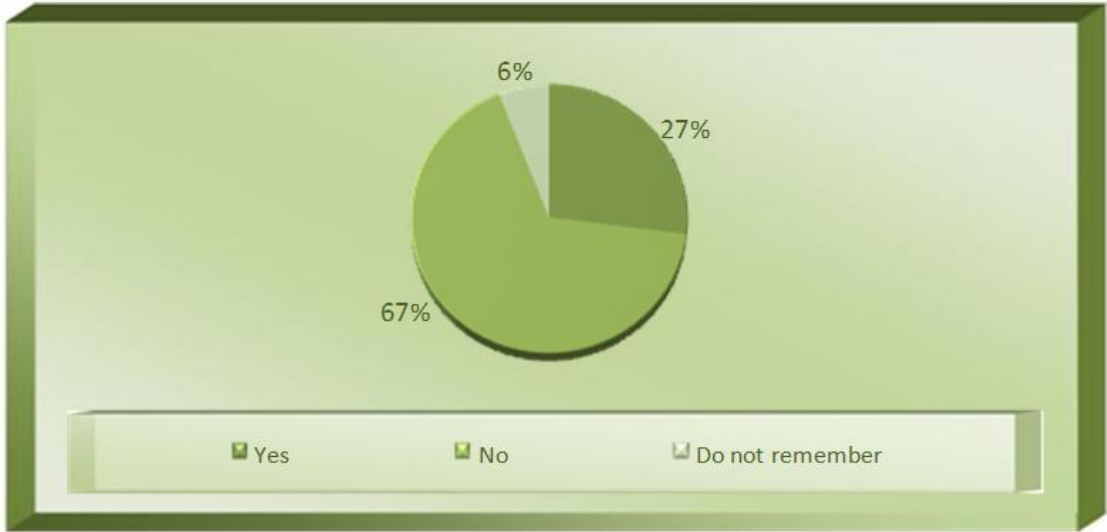


Figure 1. Participants' responses when asked if they witnessed any patients with nosocomial infection during the academic practice, João Pessoa, 2011.

According to the above figure it is possible to observe that 20 (67%) students say they have seen no cases of nosocomial infection in their practice, while 8 (27%) had care of patients with some cases of nosocomial infection and 2 (6%) did not responded. For the student or professional nursing be sure of the diagnosis of nosocomial infection, it is necessary to have at hand the microbiological examination for the identification of bacteria that is present anywhere in the hospital.

Thus, it is considered nosocomial infection when, in the same topography that community

infection was diagnosed, a different germ is isolated, followed by worsening clinical condition of the patient, all clinical signs of infection that is present from seventy-two hours after admission, when you know the incubation period of the organism and there is clinical and / or laboratory data of infection at admission, hospital infections are also agreed those manifested before seventy-two hours after admission, when the associated procedures diagnostic and / or therapeutic performed during this period, and infections in newborns, except for form transmitted

transplacentally and those associated with ruptured over 24 hours.²

Table 1. Students' knowledge about the reasons for ICU patients under artificial ventilation are more susceptible to contracting infection, João Pessoa, 2011.

Reasons for ICU patients in use of artificial ventilator are more susceptible to contracting infection	n°	%
Invasive procedure	8	24,1
Loss of protective barrier	6	18,1
Handling Equipment	5	15,1
Immunity suppressed of the patient	3	9,1
Care neglected by professionals	3	9,1
No answer	3	9,1
Environment	2	6,1
Length at hospital	1	3,1
Endotracheal tube as a reservoir for microorganisms	1	3,1
Aspirated as a vehicle for the propagation of microorganisms	1	3,1
Total	33	100,0

Table 1 shows the responses of nursing students regarding knowledge of the reasons why patients from the intensive care unit on use of artificial ventilator are more likely to acquire infection. We obtained more than one answer per participant, with a total of 33 responses.

There is prevalence in extrinsic risk factors that determine the occurrence of infection, i.e., those that are independent of the patient. Among the responses we highlight the invasiveness of the procedure 8 (24.1%), loss of the protective barrier of the patient 6 (18.1%) and handling equipment 5 (15.1%).

Invasive procedures such as intubation and tracheostomy tubes may carry microorganisms, breaking the barriers of anti-infective patient, thus predisposing to infection. In a comparative study, the hospital infection is synonymy survey, access and intubate. Through these arrangements conceptual, professionals and students of health recognize that invasive procedures for overcoming the natural barriers of the body, favoring the emergence and spread of hospital infection.¹³

Nevertheless, the respiratory tract is capable of defending itself from invasion through mechanisms such as anatomical barriers (glottis and larynx), cough reflex that helps expel inhaled particles, salivary flow that washes the epithelial surfaces and tracheobronchial secretions. However, individuals in intensive care are at high risk for aspiration pneumonia, since these individuals the cough reflex, the ability of sputum and immunological barriers are disabled.¹⁴

Regarding the handling of the equipment is emphasized that we should not change the circuit of fans frequently than every 48 hours. Studies demonstrate that the exchange circuit once a week or even no exchange does not increase the incidence of pneumonia.¹⁵ The nurse must supervise the nursing staff and their procedures, invasive or not, according to

the Law for the Year of Nursing, both in direct supervision, work together and how the performance front the continuing education programs. Nurses have an important role in identifying and reporting cases of infection associated with health care.¹⁶

Table 2. Student responses about measures adopted to prevent infection in patients with invasive mechanical ventilation in the ICU, João Pessoa, 2011.

Measures adopted to prevent infection in patients with invasive mechanical ventilation in the ICU	n	%
Education of the healthcare team.	28	24,0
Make oral hygiene frequently.	25	21,0
Keep the head elevated (30 ° - 45 °).	18	15,0
Perform a culture of surveillance routine of patients, equipment and articles for use in the service.	15	13,0
Establishing and following early weaning protocols in order to reduce rates of VAP (Ventilator-Associated Pneumonia).	15	13,0
Sterile gloves or not to perform endotracheal suction.	11	9,0
Give preference to nasotracheal intubation in place of orotracheal intubation.	5	4,0
Maintaining the pressure of the tracheal tube cuff greater or equal to 20cm/H2O.	1	1,0
Total	118	100

Table 2 presents the responses of the 30 study participants on the measures for prevention of infection in patients on mechanical ventilation in the ICU. It is observed that there has been a highlight in relation to the education of the healthcare team, where the 118 responses, 28 (24%) cited it as one of these measures. The holding oral hygiene which was cited 25 times (21%) and maintaining the head elevated appears 18 times (15%).

With regards to oral hygiene, it is noteworthy that it is possible to happen to respiratory infection by micro-aspiration of oropharyngeal secretions colonized, aspiration of oesophagogastric, inhalation of infected aerosol or, less often, by hematogenous spread from a distant site of infection. Therefore, the oral hygiene of patients on mechanical ventilation is indicated.¹⁷

Another form of respiratory infection happens with patients intubated in the intensive care unit (ICU), besides the massive aspiration of gastric contents. Recently, also

the translocation of bacteria from the gastrointestinal tract is considered a mechanism of lung infection.¹⁷ Therefore, if there is no contraindication, it should be raised to 30-45 ° the bedside of the patient undergoing mechanical ventilation to prevent aspiration.

It is noteworthy that 15 (13.0%) participants cited the performance of routine surveillance cultures of patients, equipment and articles for use in service such as infection prevention. In fact, the literature states that this practice is not recommended as routine, because the qualitative culture of tracheal secretions has low specificity for the etiologic diagnosis of nosocomial pneumonia, and although it shows considerable sensitivity detection of microorganisms, has a low specificity, not promotes the differentiation between colonization and true infection.¹⁸

The responses of students regarding the actions taken to prevent nosocomial infection in patients with multiresistant bacterial ICU, are shown in Figure 4.

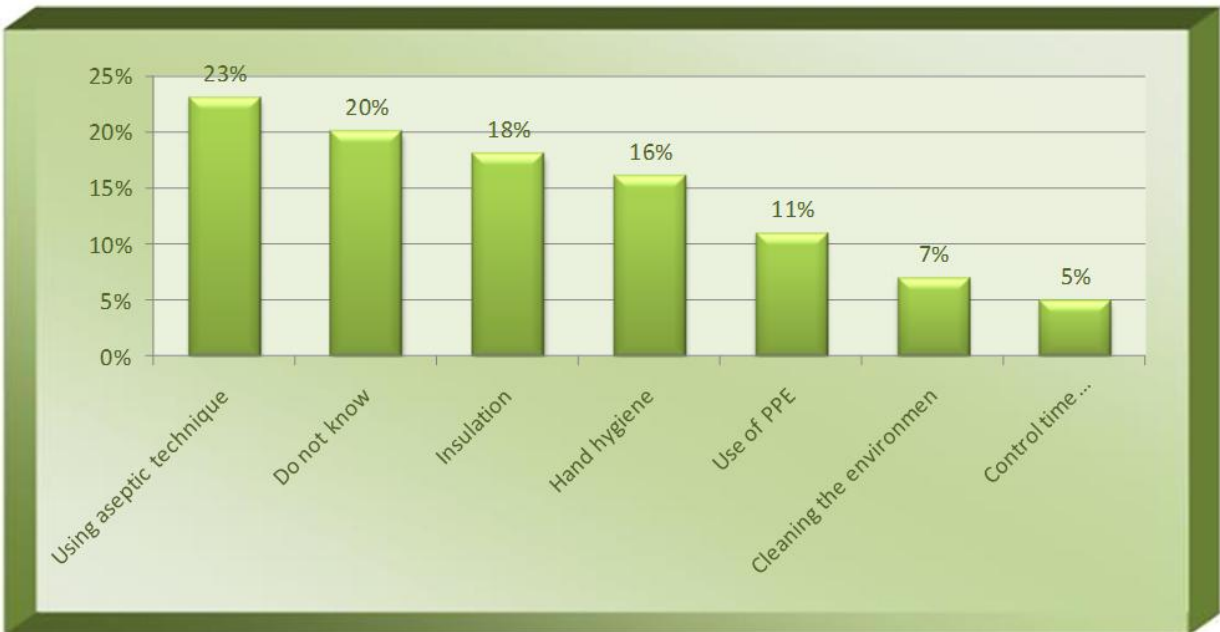


Figure 2. Responses from students regarding the actions taken to prevent nosocomial infections related to mechanical ventilation in patients with multidrug-resistant bacteria in the ICU, João Pessoa, 2011.

Figure 2 shows that 10 (23%) cited the use of aseptic techniques as each of these actions. Also noteworthy is that 9 (20.0%) say they do not know what actions to take, and 8 (18.0%) students responded that isolation is an action

that should be used to prevent infection in case of patients with multiresistance.

The most common means of transmission of nosocomial infections is the contact that generally occurs via the hands of health professionals that cannot be sanitized or

Batista JF, Santos IBC, Leite KNS et al.

Infection In patients under artificial...

disinfected properly, or no change gloves after use, which were in contact with contaminated instruments. Under this view, it is indispensable more rigorous hand washing, as well as the handling of this sterile equipment VM so that vehicles are not transmitters of pathogenic microorganisms.¹⁹ Accordingly, hand hygiene is extremely important and should be remembered at all times, both in contact with the patient and with the equipment.

The respiratory isolation technique is most often used to prevent the transmission of microorganisms spread by droplets and contact with objects contaminated by upper airway secretion in cases of patients with multidrug resistance.²⁰ It is troubling that a significant portion of the sample has mentioned not knowing what actions should be taken to prevent cases of bacterial multidrug resistance in patients using VM. This fact can be explained by the lack of prior experience in dealing with such a situation or lack of information by the Institution trainer. Thus, it is suggested that there are more reflections of teachers to maximize the teaching and learning process to fill this.

The progressive increase of bacterial resistance in hospitals has increased severity in Intensive Care Units (ICU). Nosocomial infection in ICU is responsible for the significant increase in mortality, morbidity and length of stay. We know, too, that the etiology of bacterial resistance is multifactorial, thus controlling the spread of resistant microorganisms requires the implementation of control measures involving adoption, standard and contact precautions, or isolation. This includes prevention measures for both patients and healthcare professionals.¹

The standard and isolation precautions in hospitals is further applied to the CDC (Center for Disease Control and Prevention) in your system which adopts two basic precautions: standard precautions and precautions based on the mode of transmission, which are classified as precautions contact and respiratory precautions for infectious droplets and aerosols. Standard precautions should be taken to contact with all types of patients, regardless of infected or not; precautions in case of transmission routes, where there is a diagnosis by the same microorganism present in different patients, there is a possibility of sharing the same room or ward.²¹

CONCLUSION

The trajectory allowed the achievement of the objectives proposed by the study and

highlighted the importance of research for nurses and nursing students, considering that these are fundamental within the hospital, suitable for learning on the prevention of infection in hospitals, in particular ICU.

It is known, however, that the vast majority of students in general and especially in UFPB not witness cases of patients suffering from hospital infections. This shows worrying and shows that students deserve more attention from the teachers involved in the provision of nursing care, as well as develop correct habits of hand washing, which is essential to reduce the risk of cross-contamination hospital.

The findings of this research showed that effective measures to work in the ICU are directly linked to continuing education in service and the use of aseptic technique, especially when it appears a multiresistant bacterium in the industry. The first of these challenges is anchored in the exposure to risk of cross infection in hospitals by health professionals. Furthermore, it is the responsibility of the teacher to teach in a manner consistent with the changes in the prevention of infection in recent times, as well as the ICU nursing staff, adopt a new stance on the occasion of the arrival of students to undertake internships this practical service.

Finally, it is hoped that this study D goals new thinking among nursing students and enabling other studies as a contribution in the prevention of nosocomial infection. Therefore, we suggest an expansion of the universe to other investigative realities, since the exploration of the theme refers to a critical reflection on the practice of modern nursing, as hand hygiene and reduction of invasive procedures, resulting in the reduction of nosocomial infection.

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