CAUSES OF REWORK OF HEALTH PRODUCTS AT THE MATERIAL AND STERILIZATION CENTER

Causas de retrabalho de produtos para saúde no centro de materiais e esterilização

Causas de retrabajo de productos para salud en el centro de materiales y esterilización

André Luiz Silva Alvim[1]*, Karinne Ferreira de Souza[2]

ABSTRACT: **Objective:** To identify the main causes of rework of health products detected at the Materials and Sterilization Center of a private hospital in Belo Horizonte, Minas Gerais, Brazil. **Methods:** A descriptive study was developed in a class II Sterilization Center of a private hospital in Belo Horizonte, Minas Gerais, Brazil. Documentary analysis was performed between January and June 2016, through 181 checklist records and working documents. For data treatment, descriptive statistical analysis was used for the presentation of absolute values and percentages generated by the Epi Info 7® program. **Results:** We found 605 rework items, which represented the rate of 0.75% of the total boxes and packages produced. The main causes were related to overdue products (74%) and post-sterilization organic wastes (13%). **Conclusion:** The nurse must work with its team to reduce the causes of rework, that impact unnecessary waste and costs.

Keywords: Sterilization. Indicators. Surgical Instruments. Nursing.

RESUMO: **Objetivo:** Identificar as principais causas de retrabalho de produtos para saúde (PPS) detectadas no Centro de Materiais e Esterilização (CME) de um hospital particular de Belo Horizonte, Minas Gerais, Brasil. **Método:** Estudo descritivo, desenvolvido em um CME de classe II de um hospital privado de Belo Horizonte. Foi realizada análise documental entre janeiro e junho de 2016, por meio de 181 registros de *checklist* e documentos de trabalho. Para tratamento dos dados, utilizou-se análise estatística descritiva para apresentação de valores absolutos e porcentagens geradas pelo programa EpiInfo 7®. **Resultados:** Foram encontrados 605 itens de retrabalho, que representaram uma taxa de 0,75% do total de caixas e pacotes produzidos. As principais causas foram relacionadas a produtos vencidos (74%) e resíduos orgânicos pós-esterilização (13%). **Conclusão:** O enfermeiro deve trabalhar com a equipe para redução das causas de retrabalho que impactam em desperdícios e custos desnecessários.

Palavras-chave: Esterilização. Indicadores. Instrumentos cirúrgicos. Enfermagem.

RESUMEN: **Objetivo:** Identificar las principales causas de retrabajo de productos para salud (PPS) detectadas en el Centro de Materiales y Esterilización (CME) de un hospital privado de Belo Horizonte, Minas Gerais, Brasil. **Método:** Estudio descriptivo, desarrollado en un CME de clase II de un hospital privado de Belo Horizonte. Se realizó un análisis documental entre enero y junio de 2016, a través de 181 registros de checklist y documentos de trabajo. Para el tratamiento de los datos, se utilizó análisis estadístico descriptivo para presentación de valores absolutos y porcentajes generados por el programa EpiInfo 7®. **Resultados:** Se encontraron 605 ítems de retrabajo, que representaron una tasa del 0,75% del total de cajas y paquetes producidos. Las principales causas fueron relacionadas con productos vencidos (74%) y residuos orgánicos post-esterilización (13%). **Conclusión:** El enfermero debe trabajar con un equipo para reducir las causas de retrabajo, que impactan en desperdicios y costos innecesarios.

Palabras clave: Esterilización. Indicadores. Instrumentos Quirúrgicos. Enfermería.

INTRODUCTION

The Materials and Sterilization Center (CME) is intended for the processing of health products (HP) involved in the patient's critical and semi-critical procedures. This functional unit has a history that accompanies the surgical procedures in order to ensure the prevention of Health Care-Related Infections (HCRI)[1,2].

In this sense, the search for quality in the processing of HP has been considered an essential requirement for CME. Among various tools available for monitoring the results of work processes, the more relevant ones are the quality indicators[3-5].

Indicators are quantitative measures that reflect the reality of the changes occurring in a given reality and allow the directing of behaviors to increase the organizational performance by managers. The CME has several indicators that can be incorporated into various processes. However, there are no studies in the literature that evaluated and quantified causes of HP rework[3-5].

This knowledge gap motivated the researchers to uncover the following guiding question: What are the main causes of rework detected at the CME? This study may contribute to the knowledge of factors that interfere with the costs of the CME and that may unbalance financial resources destined to the support unit, considering the current economic situation of the country[6].

OBJECTIVE

Identify the main causes of rework of HP, detected at the CME.

METHOD

This is a descriptive, quantitative study developed in a CME class II of a private hospital in Belo Horizonte, Minas Gerais, Brazil. The CME class II is defined as the one that performs the processing of non-critical, semi-critical and critical HP, of complex and non-complex conformation, subject to processing[1].

In 2010, among the several indicators linked to the CME of the studied hospital, an evaluation of the rework rate of HP was started. Since then, this indicator has contributed to the verification of the factors that have an impact on the causes of waste and unnecessary costs. In the studied hospital, the shelf-life of non-woven fabric protective wrappers/barriers (spunbond/meltblown/spunbond — SMS) and surgical grade is 30 and 180 days, respectively. In low temperature sterilization, Tyvek® expires after 365 days.

A documentary analysis was carried out between January and June of 2016 by the first researcher, through 181 checklist registers and working documents that were available in physical form and posted in the hospital quality management system. The causes of rework were recorded by the nursing technician assigned in the arsenal in a specific checklist, containing the following variables: overdue products, post-sterilization organic waste, label loss or erasure, incorrect label, wet packs, non-integral packaging and oxidation residue.

After data collection, a spreadsheet was used to group the recorded data. At the end, 605 items of rework were found in the period proposed for the study. The data was released in the Microsoft Excel® program. For the data treatment, a descriptive statistical analysis was used to present absolute values and percentages generated by the Epi Info 7® program. Because it is a study that does not involve research with human beings, an opinion from the Research Ethics Committee was not necessary. However, an institutional authorization was granted to carry out the study, elaborated by the nursing manager.

RESULTS

The total of 605 items were detected out of 80,568 HP produced, representing the rework rate of 0.75%. Table 1 shows

Table 1. Causes of rework of health products detected at the Materials and Sterilization Center, Belo Horizonte, Minas Gerais, Brazil, 2016.

Description of rework items	Number	%
Overdue health products	449	74.2
Post-sterilization organic waste	79	13.0
Wrong label	18	3.0
Wet packs	18	3.0
Label loss or erasure	17	2.8
Non-integral packaging	12	2.0
Oxidation residue	12	2.0
Total	605	100.0

that the main causes of rework were related to overdue products (74.2%) and to post-sterilization organic waste (13.0%).

Other causes of rework were less frequent, such as: wet packages (3.0%), incorrect label (3.0%), label loss or erasure (2.8%), oxidation residue (2.0%) and non-integral packaging (2.0%).

DISCUSSION

The CME is considered a vital unit of a hospital, which performs complex cleaning, preparation, sterilization and distribution of HP to various care units. These units include actions of third parties, doctors and nursing professionals, performed with the patient[1,6-8].

In this way, it becomes intrinsic to the sector to seek the quality of each stage of HP processing in order to reduce unwanted events. Based on this premise, the incorporation of quality indicators has turned into essential for monitoring the results of work processes[9].

In the studied period, it was verified that the items of rework for overdue products were prevalent when compared to the other causes. This was attributed, mainly, to the expiration date and the consequent non-use of the product by the care and surgical areas.

There is no consensus to determine a fixed expiration date for HP. Authors consider that surgical boxes remained sterile even after deliberate contamination by microorganisms and inadequate storage[10]. However, researchers say that a limit date should be established, taking into account several factors, such as cleaning, wrapping and storage, that can guarantee the maintenance of sterility[11,12].

Regarding post-sterilization organic waste, the main cause related to rework was inadequate cleaning. At the studied hospital, there were problems regarding the maintenance of the ultrasonic washing machines, preventing automated cleaning from being effective in this stage of processing.

Cleaning is defined as the removal of organic and inorganic dirt and reduction of the microbial load present in HP, using water, detergents, products and cleaning accessories. It requires mechanical action (manual or automated), and acts on internal (lumens) and external surfaces in order to make the product safe for handling and prepared for disinfection or sterilization[1]. When CME professionals do not become aware of the importance of this stage and perform it in a condescending or superficial manner, dirt will not be totally removed and may create barriers that protect microorganisms[2,7,13-15].

At the CME, the cleaning of HP is performed by the nursing team. This stage is essential to guarantee the effectiveness of the steps that will take place, avoiding that materials or instruments used in the patient become vehicles for contamination of microorganisms[1,2,7].

Other causes of rework were less frequent in the results of the CME studied. However, it is important to work with all staff to promote care management in order to eliminate unnecessary expenses with HP. Studies have shown that factors related to the quality of the packaging used for sterilization, as well as the type of material standardized by the manager, can contribute to the reduction of the rework rate[16,17].

Knowing the causes of rework for cost management is important for waste reduction. Authors assert that rework may be related to poorly structured institutional processes[16]. Thus, continuing education of professionals, through training and refresher courses, is a contributing factor to this indicator declination. In addition, it is essential that the CME nurse determines the rework causes with the nursing team for the investigation of process failures and, at the same time, an effective root-cause analysis[6,18,19].

FINAL CONSIDERATIONS

It is essential that the CME nurse works together with the nursing team to reduce the causes of rework related to overdue products and post-sterilization organic waste. In this way, one can create strategies for cost management, as well as know the factors that impact on the increase of expenses related to the functional unit.

This indicator allows the knowledge of the factors of waste that impact the generation of unnecessary costs in the CME processes. Although the rework rate represented only 0.75% of all HP produced in the studied unit, it is important to periodically evaluate the data to subsidize the cost management performed by the nurse.

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