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PARTIAL ASSESSMENT OF THE COST OF DRESSINGS PERFORMED AT AN INTENSIVE CARE UNIT

ABSTRACT

Objectives: to identify the most commonly performed dressings at an adult intensive care unit and assess their costs. Method: exploratory and evaluative study conducted at a 10-bed adult intensive care unit. The technique of direct observation and documentary research were used for data collection. The information on the costs of materials and labor were obtained from the lists of the Unified Health System. The research project was approved by the Research Ethics Committee, CAAE: 12597913.2.0000.5285. Results: 30 different types of procedures were observed and it was possible to confirm an impact of R$ 662.52 monthly, R$ 3,975.12 biannually, and R$ 7,950.24 annually spent on dressings. Conclusion: it is concluded that the solution to the problem of hospital costs cannot be considered only nursing teams' duty; multiprofessional teams should be created to work together in the daily practice of the institutions. Descriptors: Management; Costs; Nursing.

RESUMO

Objetivos: identificar os curativos mais realizados em uma unidade de terapia intensiva adulto e valorar seus custos. Método: estudo exploratório e avaliativo realizado em uma unidade de terapia intensiva adulto com dez leitos. Utilizou-se a técnica de observação direta e pesquisa documental para coleta de dados. As informações sobre os custos dos materiais e mão de obra foram obtidas das tabelas do Sistema Único de Saúde (SUS). Este estudo teve o projeto de pesquisa aprovado pelo Comitê de Ética em Pesquisa, CAAE: 12597913.2.0000.5285. Resultados: foram observados 30 procedimentos de diferentes tipos e pôde-se constatar um impacto de R$ 662,52 mensais, R$3,975,12 semestrais e R$ 7,950,24 anuais com a realização de curativos. Conclusão: conclui-se com o trabalho que não se pode considerar que seja dever apenas das equipes de enfermagem a solução para a problemática dos custos hospitalares; devem ser formadas equipes multiprofissionais para trabalharem em conjunto na prática diária das instituições. Descriptores: Gerenciamento; Custos; Enfermagem.

RESUMEN

Objetivos: identificar las curaciones más realizadas en una unidad de terapia intensiva para adultos y evaluar sus costos. Método: estudio exploratorio y evaluativo realizado en una unidad de terapia intensiva para adultos con diez camas. Se utilizó la técnica de observación directa y la investigación documental para la recolección de datos. La información sobre los costos de materiales y mano de obra se obtuvieron de las listas del Sistema Único de Salud. El proyecto de investigación fue aprobado por el Comité de Ética en Investigación, CAAE: 12597913.2.0000.5285. Resultados: fueron observados 30 procedimientos de diferentes tipos y se pudo constatar un impacto de $R 662,52 mensuales, $R 3,975,12 semestrales y $R 7,950,24 anuales con curaciones. Conclusión: se concluye con la investigación que no se puede considerar la solución del problema de los costos hospitalarios como deber de los equipos de enfermería únicamente; deben formarse equipos multiprofesionales para trabajar juntos en la práctica diaria de las instituciones. Descriptores: Gestión; Costos; Enfermería.

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INTRODUCTION

Taking into consideration the topic “health economic assessment”, it is possible to observe how nurses are technically and scientifically unprepared to manage resources and hospital costs. However, nurses are the professionals that deal directly with procedures performed to patients admitted and manage the material resources that will be allocated to healthcare. In the meantime, there is a special interest in the economic area due to the increased costs incurred within the health field.

The current economic scenario features a reality of resources scarcity. However, the needs of services do not decrease, on the contrary, they increase on a daily basis. Technological developments brought gains to the health field, both in the area of treatment and diagnosis and nursing care including the most diverse pathologies. Coupled to this, however, costs may be unsustainable for the health system, as well as for society. In this way, it is necessary to perform insightful resource allocations and improve the control systems within hospital units. The high cost of health in Brazil and the difficulty in funding are leading service providers, funders, authorities, and users to be increasingly worried about the costs of health services and their impact on the quality of these services.

Faced with so many procedures, dressing materials draw attention because the procedures are performed daily, which leads to the use of a large amount of material. With that, it is necessary to question the true cost that these procedures represent to the revenue of a hospital unit.

Costs are understood as representative of the expenditure related to goods or services used in the production of other goods and services. In the present study, we only used the direct costs (those included in the calculation of product/service - wages and materials) concerning the performance of dressings that include materials used to provide care added to the cost of professional labor.

Some authors claim that performing dressings has a peculiar characteristic, because they cause a false impression of low cost, considering the low complexity of their effective process. However, in order to meet hospitals needs, dressings can become a costly procedure, since they are characterized by the use of a large amount of materials, and professional skills and knowledge, in addition to the choice and use of these resources.

In intensive care units (ICU), the performance of dressings is a daily nursing activity, and it is specific to each type of lesion. Nowadays, there is a variety of dressings, biological bandages, and drugs intended to care wounds, which are provided by Brazilian government health institutions. However, despite this diversity, the choice of treatment should be carried out individually, taking into account the history of each patient, the material available, the indication, the cost, and the effectiveness, such as: essential fatty acids (EFA); calcium alginate; collagenase; activated carbon; semi-permeable membranes; hydrocolloid; hydrogel; and papain.

The present study becomes relevant, because it discusses the economic values within the nursing field, specifically the costs of dressings performed in an ICU, since this category of professionals works directly with the resources that are made available for healthcare. It is also important so that nursing—especially nurses—which is responsible for the promotion of care within the sectors, can recognize the importance of its participation in the control of the materials intended for the procedure, managing its use in order to avoid waste.

Given this, the goals of this study are:

- To identify the most commonly performed dressings at an adult ICU.
- To assess the costs of the most commonly performed dressings at an adult ICU.

METHOD

This is an exploratory and evaluative study with partial analysis of health costs conducted at the 10-bed ICU of a university hospital of the public education network located in Rio de Janeiro. Among the factors that contributed to the choice of scenario, it is worth mentioning the fact that it is one of the sectors in which the researcher carries out her academic activities, which allowed better approach to the team in order to conduct the study. The collection of information occurred for seven consecutive days in November 2013 through observation performed during the daytime period.

The technique used was direct observation of the dressings performed by nursing professionals and documental assessment of medical records of patients admitted and dressings records. With respect to data on costs, we used the price list of hospital materials provided by the Unified Health System (UHS) to know the unit cost of each
material used in the procedure. Subsequently, we calculated the total cost of each dressing for the institution.

Three instruments were used for data collection. The first recorded the amount and type of each dressing in order to identify the most common performed in the sector. The second recorded the average amount of each material used for each type of dressing based on the price list of hospital materials provided by the UHS. Each dressing was valued making daily, weekly, monthly, quarterly, and biannual estimates of costs for the institution. The third instrument recorded which professional performed the procedure and the average time spent performing it. The time spent added to the cost of labor of every professional class provided by the Ministry of Health allowed calculating the cost of each minute worked using the rule of three. This calculation allowed estimating the total average cost of labor for performing the dressings.

The calculation to assess the cost of materials was carried out using the arithmetic average of the amount of each material used in each type of dressing per day. Then, based on the price list of hospital materials quoted above, we found the price of each item separately. After adding the cost of all materials and also the cost of labor for the procedures, we obtained the total daily average cost for each type of dressing. In this way, it was possible to make weekly, monthly, quarterly, and biannual estimates of costs for the procedures.

Initially, the search would be performed both through the observational method and assessing the medical records to find the evolution of the wounds treated during hospitalization. However, when we assessed the records, it was observed that the professionals of the sector did not include the materials used for the dressings and, also, they did not follow a standard for performing the dressings based on the assessment of each patient’s wound, which means that no one followed up the evolution of every wound. As a result, the only technique used for collecting the data was the direct observation of the procedures.

The present study complied with the Resolution 466/12 of the National Commission of Ethics in Research - CONEP. The research project was approved by the Research Ethics Committee of the Federal University of the State of Rio de Janeiro (CEP/UNIRIO), under certificate CAAE: 12597913.2.0000.5285.

RESULTS

During the collection of data, we observed a total of 30 dressings performed in ten different patients admitted to the ICU. Pressure ulcers were the most frequent, reaching 43% of the total, of which 13% were grade III sacral pressure ulcers, 13% were grade II calcaneal pressure ulcers, 10% were grade II sacral pressure ulcers, and 7% were grade I calcaneal pressure ulcers, followed by 34% deep venipuncture dressings, 13% drain dressings, and 10% surgical dressings. (Figures 1 and 2)

Figure 1. Amount and types of dressings performed by nursing technicians. Rio de Janeiro, Nov. de 2013.

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Figure 2. Amount and sub-types of dressings performed by nursing technicians. Rio de Janeiro, Nov. de 2013.

Figures 3 and 4 illustrate the average total cost of each type of dressing (material + labor costs).

Figure 3. Average/total cost of procedures performed at the ICU. Rio de Janeiro, Nov. de 2013.

Figure 4. Average total cost of the procedures observed at the ICU. Rio de Janeiro, Nov. de 2013.

Figures 3 and 4 illustrate the cost of each dressing and its impact in weekly, monthly, quarterly, and biannual proportion. Pressure ulcer dressings were those who represented
the greatest expenses for the institution, with a monthly proportion of R$ 421.12; R$ 266.60 for sacral ulcer dressings, and R$ 154.52 for calcaneal ulcer dressings (Figure 3). In a biannual perspective, the total expenditure would be R$ 2,526.72, with R$ 1,599.60 for sacral pressure ulcers and R$ 927.12 for calcaneal ulcers, followed by deep venipuncture dressings with an annual impact of R$ 543.84.

As noted in Figure 4, the monthly costs of surgical and drain dressings were R$ 196.08, with R$ 125.96 for surgical dressings and R$ 70.12 for drain dressings. Performing a projection for six months, the cost would be R$ 1,176.39, with R$ 754.96 for surgical dressings and R$ 421.43 for drain dressings. The annual costs would be R$ 2,352.78, with R$ 1,509.92 for surgical dressings and R$ 842.86 for drain dressings.

As regards the professionals who performed the dressings, Figure 5 illustrates that, during the period of data collection at the ICU, 100% of the dressings were performed by nursing technicians.

**DISCUSSION**

Pressure ulcer dressings stand out for being the most frequent at ICUs. A study conducted at a university hospital of the State of São Paulo showed great occurrence of pressure ulcers in patients admitted at ICUs. These ulcers may be explained by the fact that patients remain sedated or with altered level of consciousness and lying long in bed, under ventilatory support, using vasoactive drugs and exhibiting hemodynamic instability. That study also showed that pressure ulcers—although they are a negative indicator of health services quality—represent a problem underestimated by professionals and are still occurring with high frequency in patients admitted to ICUs.

Regarding the prevention of ulcers, a study conducted on patients hospitalized at medical-surgical units of hospitals of the State of Bahia shows that actions such as change of decubitus position every two hours, hygiene performed in the patients whenever they have urinated or defecated, hydration of 1,500 to 2,000 mL per day, and use of body hydrating lotion minimize the occurrence of ulcers and also avoid unnecessary health expenditures.

Still, with respect to nursing procedures for pressure ulcer care, a study that used the retrospective analysis of costs in a hospital of Pernambuco found that it is more advantageous preventing pressure ulcers through risk assessment scales than allowing them to occur and try to treat them afterward, because the distress is much greater for health teams, in addition to raising costs for the entire system. This fact can be observed in the assessment of the treatment provided to two patients followed up in that study. The first caused an average daily expenditure of R$ 180.00 due to a grade I ulcer that evolved quickly to grade III as a result of lack of mobility. This applies to patients of ICUs, because they require debridement, hydrogel dressings, and also activated carbon, among other medications. For the second patient, the nursing team carried out a daily assessment of the scale of risk for developing ulcers and also performed prevention actions, thus making the institution spend R$ 98.90, i.e., a difference of 45%.

With the considerable decrease in costs achieved with prevention measures regarding pressure ulcers, the value saved in the long term can be used for the purchase of more types of dressings for the unit or even hiring more professionals.

As regards deep venipuncture dressings—which also had a great representativeness (34%)—similar findings were found in a study conducted in a public university of Campinas. That study reviewed the technical and practical aspects of central venous and peripheral arterial cannulation and found that detailed knowledge of the anatomical references and the narrow obedience to technical steps described for the percutaneous vascular access and its care are decisively important preconditions for avoiding complications.

It was observed that the percutaneous vascular access has become routine at ICUs in the last three decades. Justifications for the high frequency of such procedure in closed units are related to the innumerable possibilities of invasive hemodynamic monitoring.

Another study assessed the performance of nursing professionals carrying out deep venipuncture dressings. Of the 55 professionals interviewed, five were nurses, 12 were nursing technicians, and the others were nursing assistants. It was observed that the procedures were similarly performed both by technicians and nurses. However, use of gloves, observing complaints and probable adverse reactions at the scene, and recording the procedures were measures that nursing technicians did not adopt.

A study conducted in a large general hospital of the State of São Paulo found that treating deep venipuncture dressings depended on knowledge of anatomy.
physiology, microbiology, pharmacology, and psychology, among others. It also pointed out that technical and scientific knowledge was of great importance for the prevention of complications, such as loss of access and infection of the puncture site, which would involve further attempts to obtain access and treatment with antibiotics, among other procedures that would increase hospital costs.

Another study on drain and surgical wound dressings found that the performance of such procedures was common in closed units. Nurse are the professionals that stay longer next to the patients and have technical and scientific conditions to assess the surgical site in order to detect early abnormalities related to healing. According to the above, nurses can use strategies to better monitoring the healing of these sites, such as tracking the elapsed time since the surgery, because this way they will be able to compare the findings with what is physiologically expected for each stage of surgical wounds healing, detecting early abnormalities and determining the proper care to be provided.

A study conducted at a university of the State of Sao Paulo showed that after surgery the patients face a surgical wound, which, though they seem a simple suture line, require special care concerning appropriate assessment and postoperative management. To this end, professionals must keep up to date with regard to these procedures.

Surgical wound and drain care are constantly carried out by nurses and the nursing technical team. The daily observation of the surgical site or drain placement site is essential to monitor the healing process and identify possible phlogistic signs, so that appropriate dressing can be performed. Regarding the costs for performing them, it must be taken into consideration that tissue loss and the type of healing will require using more material or not.

Nurses stand out as the professionals who have the knowledge to program the care to be provided, such as daily assessment of the insertion site and the choice of dressings based on guidelines and protocols. In this way, nursing professionals should be trained to carry out their actions safely and consciously avoiding rework, waste, and increased costs. An example of educational action and training that nurses can offer to their teams is the use of gloves and correct hands-washing. The same study showed that of 55 professionals observed, 66% did not wash their hands or wore gloves to perform the procedures, i.e., measures that would prevent the contamination of the insertion site and possible infection. A pair of gloves costs R$ 0.65 to the institution, i.e., a value much lower than that resulting from possible measures that should be taken after the damage has occurred.

The costs caused to the institution by surgical and drain dressings are R$ 196.08 monthly, R$ 588.24 quarterly, R$ 1,176.39 biannually, and R$ 2,352.78 annually. Apparently, it is a much lower expense than the cost of other dressings. However, the identification of the greatest occurrence of wastes occurs in these procedures when gauze packs are used. The average waste is one to two packs per procedure, especially in those with greater size. An average of 129.01 packs were used by the professionals per week, which represents a weekly expenditure of R$ 42.56 to the institution only with this material. If there were no waste of packages that are open and not used, the expenditure could be reduced by up to 20%. This would produce a weekly saving of R$ 8.52, i.e., the institution would save R$ 408.96 annually.

Since the goal of the present study was to assess the costs of dressings performed at the ICU, we made a prediction of the cost of labor when the procedures were performed by the technicians and the nurses, taking into account the wage of each category and the average time for completion of the procedure, regardless of their other functions performed at the unit. This way, assessing the institution's expenditure on the labor of nursing technicians performing the dressings observed, it was found that there was a monthly expenditure of R$ 85.32; R$ 4.60 corresponding to ten deep venipuncture procedures, R$ 22.08 to seven procedures for sacral and calcaneal pressure ulcers, and R$ 33.04 to six calcaneal ulcer dressings. The three surgical dressings represented R$ 16.80 of the total, and drain dressings, totaling four procedures, represented R$ 8.80. The biannual total impact, taking into consideration the same amount of dressings, was R$ 511.92 and the annual was R$ 1,023.84.

If the same dressings were performed exclusively by nurses, the monthly expenditure of the institution would be R$ 114.09; R$ 7.04 corresponding to deep venipuncture dressings, R$ 34.40 to sacral and calcaneal pressure ulcer, R$ 33.40 to calcaneal ulcers, R$ 25.68 to surgical dressings, and R$ 13.60 to drain dressings, causing an impact of R$ 684.54 biannually, and R$ 1,369.08 annually.
The annual difference between the procedures performed by the nursing technicians and the nurses would be R$ 345.45. This causes impact considering that when nurses perform the dressings, the steps would possibly be better chosen than when performed by nursing technicians. As a result, the healing time of the wounds could be reduced and the expenditure on materials diminished.

With the results of the study, we made the projection of the average costs of the dressings for the institution. There was a monthly average cost of R$ 662.52 with 30 dressings performed in ten patients. They were ten deep venipuncture procedures, seven for sacral pressure ulcers, six for calcaneal pressure ulcers, four drain dressings, and three surgical dressings. The impact caused to the institution would be R$ 1,987.56 quarterly, R$ 3,975.12 biannually, and R$ 7,950.24 annually. If the projection for 100 patients is made, in just one month there would be an expenditure of R$ 66,252.00, R$ 198,756.00 quarterly, R$ 397,512.00 in one semester, and an annual average of R$ 795,024.00.

The results of the present study demonstrated the importance of managing care, not only planning patients’ care, but also managing costs. We observed that a routine activity at the ICU—i.e., the performance of dressings—can cause unnecessary expenditure to the institution when these procedures are not planned and managed. Nursing activities for reducing the costs are developed through the supervision and control of the use of materials. Given this, we determined the importance of carrying out continuing training of the nursing team using treatment protocols and performing wounds assessment.

**CONCLUSION**

Through the present study, it was possible to observe that the solution to the problem of hospital costs cannot be considered only nursing teams’ duty. Thus, it is suggested that multiprofessional teams are created in hospitals, working together and seeking solutions based on scientific studies, and bringing scientific discoveries to the reality and daily practice of the institution. The idea that pressure ulcers increase patients’ length of hospital stay and, consequently, the expenditure for the institution cannot be refused. This value could be reduced with the use of different procedures during nursing care, such as the frequent change of decubitus position, prevention of pressure ulcers, and frequent assessment of wound staging, so that appropriate procedures can be performed and the healing time decreased, which directly affect the costs.

Many of the material resources used are standardized by the hospital unit. This fact may contribute to the increase of the costs, because not always the total amount contained in the package is fully used, as is the case of 0.9% sodium chloride in 250 mL bottles that cost R$ 1.23 and are discarded even when they have not been completely used. There is 0.9% sodium chloride in ampoules of 10 mL that cost R$ 0.10 and that would certainly reduce the costs of the procedures that require only 10 mL to be performed.

The records of materials used enable the managers of the sector to measure the costs of all the dressings in a progressive way, thus making it possible to decrease the costs if a probable waste had been identified.

With respect to the procedures, it was expected that the wounds and their staging had been assessed, followed by the choice of an appropriate procedure for each case, which would result in faster healing and therefore less expenditure. However, most wounds found in the patients of the sector tended to be treated with the same procedure, which might not be the appropriate for each case and could even delay healing. This occurs because nurses often do not perform many of the procedures they should. They delegate these procedures to the nursing technicians, who do not have the technical and scientific knowledge as nurses do, and choose to perform standard care, which can give the false impression of improving wounds or being cheaper. Therefore, since this is not an ideal procedure, healing time increases and the costs increase, unlike when nurses assess the wounds and choose the procedures for each phase of healing, which in the long term becomes cheaper for the institution.

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