



Journal of Nursing

Revista de Enfermagem

UFPE On Line

ISSN: 1981-8963

ORIGINAL ARTICLE

PRESSURE ULCERS: A PERSPECTIVE OF COST MANAGEMENT IN NURSING SERVICES

A ÚLCERA POR PRESSÃO: UMA PERSPECTIVA DE GERENCIAMENTO DE CUSTOS NOS SERVIÇOS DE ENFERMAGEM

LAS ÚLCERAS POR PRESIÓN: UNA PERSPECTIVA DE LA ADMINISTRACIÓN DE COSTOS EN LOS SERVICIOS DE ENFERMERÍA

Jamile Fujishima Neves¹, Kátia Stancato²

ABSTRACT

Objective: to check the cost of dressing material used during application to patients with pressure ulcers, as well as the time required for the procedure (since the moment of choice of materials until their disposal). **Method:** prospective and exploratory study with quantitative approach. In July 2008, we observed the application of 27 dressings in admitted patients in the intensive care unit of a university hospital in the State of São Paulo, Brazil. The patients were selected according to the degree of injury. In order to carry out the calculations, we wrote down the values of the materials used in Brazilian reais, which were reported by the Department of Human Resources of that hospital. The data were analyzed descriptively by the Statistical Office of the College of Medical Sciences according to the following variables: costs of procedures and costs of materials. The research project was approved by the Committee of Ethics in Research - UNICAMP, under Opinion 878/2007. **Results:** the observation of dressing application comprised a total of six patients undergoing dressing for 19 grade II pressure ulcers (70.4%), one for grade III (3.7%), and seven for necrosis (25.9%). There were no cases of grade IV pressure ulcers confirmed in this analysis. **Conclusion:** analyses of costs, as those carried out in this work, demonstrate the importance of studies involving costs for dressings. Due to their high cost and considering the time spent by professionals to carry them out, the best way to reduce these costs is the prevention of wounds. **Descriptors:** pressure ulcer; economy in nursing; cost and cost analysis.

RESUMO

Objetivo: verificar o custo com material de curativo utilizado durante o procedimento em pacientes com úlceras por pressão assim como o tempo despendido no procedimento (desde o momento de escolha dos materiais usados até o seu descarte). **Método:** estudo prospectivo e exploratório com abordagem quantitativa. Foi observada, em julho de 2008, a realização de 27 curativos em pacientes hospitalizados na Unidade de Terapia Intensiva, de um hospital escola do interior do Estado de São Paulo. Os pacientes foram selecionados de acordo com o grau de lesão. Para a realização dos cálculos, foram anotados os valores, em reais, dos materiais utilizados, os quais foram informados pelo setor de Recursos Humanos do referido hospital. Os dados foram analisados descritivamente pelo Serviço de Estatística da Faculdade de Ciências Médicas de acordo com as seguintes variáveis: custo do procedimento e custo do material. O projeto de pesquisa recebeu aprovação do Comitê de Ética em Pesquisa da UNICAMP com o parecer 878/2007. **Resultados:** a observação da realização dos curativos contemplou um total de seis pacientes, sendo 19 curativos de Grau II (70.4%), um de Grau III (3.7%), e sete para necrose (25.9%). Não houve casos de UP Grau IV confirmados nesta análise. **Conclusão:** as análises de custos, como realizadas neste trabalho, demonstram a importância de fazer estudos que envolvam os custos para curativos, pois devido a eles serem elevados e considerando o tempo depreendido pelos profissionais para realizá-los, a melhor forma de reduzi-los é a prevenção das feridas. **Descritores:** ulcera por pressão; economia na enfermagem; custo e análise de custo.

RESUMEN

Objetivo: comprobar el costo de material para vendajes durante la aplicación a pacientes con úlcera por presión, como también el tiempo requerido para el procedimiento (desde el momento de elección del material hasta su eliminación). **Método:** estudio prospectivo y exploratorio con enfoque cuantitativo. En julio de 2008 se observó la realización de 27 curaciones en pacientes hospitalizados en la unidad de cuidados intensivos de un hospital universitario del interior del Estado de São Paulo, Brasil. Los pacientes fueron seleccionados de acuerdo con el grado de lesión. Para realizar los cálculos se anotaron los valores en reales (*moneda brasileña*), los que fueron informados por el departamento de Recursos Humanos de ese hospital. Los datos fueron analizados descriptivamente de acuerdo con las siguientes variables: costos de los procedimientos y costos de los materiales. El proyecto de investigación fue aprobado por el Comité de Ética en Investigación de la UNICAMP, dictamen 878/2008. **Resultados:** la observación de la aplicación de curaciones se realizó en seis pacientes con 19 curaciones de úlcera por presión grado II (70,4%), una con grado III (3,7%) y siete para necrosis (25,9%). No hubo casos confirmados de grado IV en este análisis. **Conclusión:** los análisis de costos, como los realizados en este estudio, demuestran la importancia de estudios relacionados a costos de curaciones, porque debido a éstos ser altos y considerando el tiempo utilizado por los profesionales para realizarlos, la mejor manera de reducir esos costos es la prevención de heridas. **Descriptores:** úlcera por presión; economía en enfermería; costos y análisis de costos.

¹Nurse graduated from the Department of Nursing at the Medical Sciences School, State University of Campinas (UNICAMP), São Paulo, Brazil. Former scholarship holder of FAPESP. E-mail: arimile@yahoo.com.br; ²Teacher of the Department of Nursing at the Medical Sciences School of the State University of Campinas (UNICAMP), São Paulo, Brazil. Email: katia@fcm.unicamp.br

INTRODUCTION

Pressure ulcers (PU) are a problem that affects a large number of admitted patients. This is an injury that emerges in the skin as a result of hospital stay. Studies on this subject have been carried out; however, in the area of nursing, knowledge about the issue still needs to be expanded within the literature.

This injury takes place due to a lack of blood and oxygen supply caused by excess pressure on the skin, mainly in the regions of bony prominence or pressure combined with shearing and friction. Another study describes that pressures between 60 and 580 mmHg from one and six hours may cause ulcers and they can develop within 24 hours or even take up to five days before they develop.

One study carried out with ICU patients shows that there is high risk for the formation of PUs and that the incidence of this injury varies from 1% to 43%. Patients usually react to excessive pressure due to decreased sensory perception caused by sedatives, painkillers and muscle relaxants. In addition, in another research on incidence of PUs, it was found that most patients admitted to an ICU (approximately 18% to 52%) were at risk of developing them.

Other studies developed clinical and epidemiological assessment of ulcers in admitted patients and as risk factors they detected: skin type – higher incidence in whites than in blacks and in advanced age (over 60 years old); weight loss –affecting mainly the regions with bony prominences; changes of mobility; decreased sensory perception; continuous use of medicines as antibiotics, anti-hypertensives, anticonvulsants and sedatives; constant skin humidity; presence of chronic diseases, such as diabetes mellitus and cardiovascular diseases; and length of hospital stay. However, these studies do not point the relationship between the presence of UPs and the sex of the individuals.

A definition of PU can be understood as a consequence of the lack of physical activity that can be prevented and cured with a good nursing care, which should aim to stimulate the movement of the patient, perform decubitus changes and use special mattresses.

However, nursing can only act properly in the prevention of ulcerative wounds by being able to detect predisposing risk factors in patients and being aware of the damages caused to patients and also to health institutions. Damages caused to patients are

risks for infection to which they are exposed and psychological and social changes.

For the institution, whether public or private, such fact increases expenses on dressing materials, time and the human service giving assistance. It is worth mentioning that material resources represent about 75% of the capital of organizations in general and the way they are administered reflects in institutions' productivity and costs. For these reasons, nurses are responsible for managing the resources available and they should be able to coordinate assistance, human potential and material resources.

Materials management is a specialized branch of the science of administration, as it deals specifically with a set of norms related to the management of articles essential to the production of certain products or services. Materials management is assumed by nurses, whose dynamics of work does not permit the establishment of proper estimates and provision of the materials that will be used in assistance, whether it is for a group, individual or collective. Therefore, responsibility for reviewing nursing techniques and procedures aimed at service quality along with the lower cost does not rest only with nurses, but the whole team also.

In the United States, UPs are also a very important problem. Approximately 1.6 million ulcers develop in hospitals in this country each year with a health care system cost of 2.2 to 3.6 billion dollars.

The purpose of this study is to check the costs of dressing material for UPs, as well as the time spent in the procedure (since the moment of choice of materials used until its disposition). It is known that there are many studies on UP, but very few that have actually raised costs.

Regarding what has been mentioned and the importance of the subject for health care professionals, the production of knowledge in this area also benefits patients, since the service is incremented, culminating in a better hospital stay and quality of life.

Joining efforts, people can overcome individual limitations and achieve results impossible to be achieved individually. It is known that collaboration and cooperation of professionals dealing with patients' care is vital in order to achieve common goals, such as the prevention of UPs. There is no doubt that the result of this collective effort is not the sum, but the multiplication of individual efforts.

METHOD

This study was extracted from the final report of a Scientific Initiation Research Project - FAPESP/UNICAMP, in effect from 2009 to 2010. It is a prospective and exploratory study with quantitative approach.

Firstly, we conducted a survey of patients with UPs in all units of admission of a university hospital, in the State of São Paulo, for seven days (from June 05th to June 26th, 2007). After this preliminary survey of the epidemiological profile of UPs, we found a significant number of patients with this type of injury in coronary and general ICUs.

The general ICU currently has 12 beds to assist patients in critical stage. In this facility, with a total of nine admitted patients, we detected 15 UPs. For this reason, the general ICU was the place chosen for this study.

We included patients with at least one UP (grades II, III, IV) and necrosis, and who had the dressing exchange prescribed only once a day. Grade I UPs were excluded from the study because they belong to a stage in which the skin is still intact, so there are not dressings prescribed. The stage of necrosis was included because, even though it is not possible to define the grade of the injury, it requires dressing.

It was not possible to gather data from several patients during the same shift, because dressings are changed during patients' personal hygiene, which occurs simultaneously to other baths. Other patients were excluded from the study because dressings were removed without proceeding with occlusion. We only included dressing exchanges in which the researcher was present.

The instrument used for recording the data to be analyzed was a form drawn up for this study (Appendix I), which was filled out for each patient who had at least a pressure ulcerative lesion. In order to obtain data for the study, it was important to identify patients with UPs daily and that these patients matched the criteria for inclusion, so that the researcher could observe the dressing procedures. The form was filled out with the start time (removal of the dressing) and the end of the procedure (occlusion), and the professional rank (nurse or nursing technician)

in order to calculate the average time spent by rank in dressing exchanges, as well as recording specifically the materials and quantities used.

It is important to note that the ideal for time counting would be measuring the time since the choice of materials to their disposition. However, according to the routine of the general ICU, the process is not unique and exclusive for dressing, as materials separation occurs concomitantly to those for patients' baths. For this reason, the procedure time was counted from the removal of the dressing to its occlusion.

Patients' names, bed numbers and medical registries were only used to facilitate the collection of data. However, any patient identifiable information was omitted in this article. The collected data were input in a Microsoft Excel[®] spreadsheet and were forwarded to the Statistical Office of the College of Medical Sciences in order to proceed with the proper analysis of the variables.

Performing data analysis, we calculated the cost of the procedure and the cost of the materials:

Cost of the procedure: we calculated the average time spent by professional ranks for the procedure of dressing exchanges. For the calculations, we added the remuneration of nursing technicians and nurses and the corresponding monthly working hours, together with the additional social and labor charges (SLC). Insalubrity premium and a percentage for the professionals are included as SLC according to labor contracts (UNICAMP Open Competitive Examination or FUNCAMP recruitment). It is known that there are additions to salaries according to professionals' qualification.

Firstly, the cost of one minute work of nurses and nursing technicians must be known, taking into consideration that they work 40 hours per week (or 160 hours per month). To this end, it was necessary to obtain information about wages and labor charges at the Department of Human Resources (HR) of that hospital.

The calculation was performed according to the formula set by the researchers in this study, based on the recommendations of the hospital Infirmary:

Cost of a professional minute	(Monthly wage + SLC)
= -----	+ 60
work in Brazilian reais (R\$)	monthly work hours

The salary was added to the SLC and divided by 160 that correspond to the total of monthly working hours of both nurses and technicians, according to the scheme of hiring by the service (information provided by the Department of HR). However, this operation provides the cost of one hour work. For this reason, the first equation is divided by 60 to obtain the cost of a minute work. The values of one minute work are shown in the last two

rows in Table 1.

Material cost: we surveyed every type of material used for the dressings (procedure gloves, sterile gloves, dressing tray, 0.9% physiological saline, needles, gauze, fixing material, essential fatty acids (EFA), and other products like papain, etc. The Department of Material Resources provided the cost of each item (Table 1).

Table 1. Cost of materials and human resources required. Campinas, São Paulo, 2010.

TYPE	CODE	SPECIFICATION	PRICE
Dressing Kit (Tray)	Kt	Bandeja estéril	3,8500
Procedure gloves	Lpr	P/M/G (Unidade)	0,0530
Sterile gloves	Les1	P (pcte com um par)	0,3070
Gauze	gz	10 unidades	0,2326
Needles	ag1	40X12	0,0340
Micropore tape	mcr	50mmX10m	2,0760
Trichotomy device	tr	1 unidade	0,5100
Scalpel	be	1 unidade	0,4180
EFA	AGE	20ml	2,1900
10% Papain	Pap	50g	9,2000
Crepe bandage	At1	12X1,8m	0,3280
	At3	20X1,8m	0,5720
Crepe tape	Fcr	16mmX30m	1,1200
Orthopedic cotton	A.ort1	10cmX1,8	0,1300
	A.ort2	15cmX1,8	0,2000
	A.ort3	20cmX1,8	0,2400
0.9% Physiological saline	SF1	10ml	0,1100
	SF2	100ml	0,9500
Nursing technician	Te	1min	0,2222
Nurse	Enf	1min	0,4113

Finally, the costs of procedures and materials were added in order to get the total cost of the process. We measured the area of injury by pressure in all the dressings, and the analyses were performed by cm², in accordance with the characteristic of the UPs.

The research project received approval without restrictions by the Committee of Ethics in Research of UNICAMP, Opinion No. 878/2007. Later, the data were collected after an informed consent form signed by the employees who conducted the dressings on the patients.

RESULTS

The field research was carried out in July 2008, in which 27 dressings were observed in a total of six patients with 19 grade II UPs (70.4%), one grade III (3.7%), and seven necrosis (25.9%). There were no cases of grade IV UPs during this period.

We separated the costs in different tables according to the degree of injury or tissue damage. Tables 2 and 3 correspond to grade II and III UPs, respectively, and Table 4 corresponds to necrotic tissue, which were treated with differentiated dressing. Table 5 gathers information from all the dressings observed.

Reading by row (horizontally) provides the analysis of cost per item of material used or

by human resources demanded, according to each table. Columns (vertical) show costs according to the patients, preserving their identity by using sequential letters of the alphabet. In the lower right corner of each table there is a quadrant showing the value (in Brazilian reais - R\$) of all the expenses in its respective table.

For standardization, four decimals were used in the tables, as this was the way in which the institution provided the values of each material used. However, in the discussion of the results, the values have two decimals (standardized to Brazilian reais).

Common dressing items such as gauze, 0.9% physiologic solution, EFA, sterile and procedure gloves were used. The routine for the process in the general ICU is characterized by using sterile gloves and not dressing kits, which include trays and sterile clamps. However, the kits are only used in the Infirmary in the cases of debridement of necrotic tissue. Almost all dressings are performed by nursing technicians, with exception of the last case.

For this reason, the nursing technicians' total work of 172 minutes cost R\$ 38.22 for the performance of 26 dressing, while the Infirmary spent R\$ 18.92 in three dressings. Among all the expenses, items that had greater value on consumption were: tray (R\$ 11.55), EFA (R\$ 7.88); package of sterile gauze

(R\$ 6.05); sterile glove (R\$ 5.83); 100 ml of 0.9% physiological saline (R\$ 4.75); 10% papain (R\$ 4.42); crepe bandage (R\$ 2.86); and procedure glove (R\$ 1.91).

Regarding 27 dressings performed, the expenses with human resources and materials were approximately R\$ 101.65; corresponding to an average cost of R\$ 3.76 per dressing and R\$ 16.94 per patient. By estimating values, the average expenses for all types of PUs studied points to a value of R\$ 45.12, i.e., this number corresponds to what would be spent per injury.

● Grade II Pressure Ulcer

This type of ulcer is characterized by loss of the epidermal layer (National Pressure Ulcer Advisory panel - NPUAP, 2008). In the total of 19 dressings observed, there was a total expense of R\$ 47.59. It can be said that there was a cost of thirty-one cents per square centimeter. On average, injuries of this type among patients correspond to 30.65 cm² and the average expense per dressing of this gradation was R\$ 2.50. The cost variance between patients with dressings for this type of PU ranged from a minimum of R\$ 2.40 to a maximum of R\$ 18.49.

The amount of time that the nursing technicians spent during the procedure of this category was 86 minutes, which represents an average of approximately 17.2 minutes per patient and 4.5 minutes per dressing, ranging from two to 35 minutes. Knowing that the nursing technicians' minute work costs R\$ 0.22 (Table 1), the expenses of their work were R\$ 18.92.

Knowing that the average cost of dressing is R\$ 2.50, the following speculation is possible: multiplying the length of hospital stay (since the day of admission to discharge or until the end of the month of this study) by the average cost of the dressing, the estimated cost for the month can be obtained. Adding the dressing of each patient, it was possible to get the average amount spent for this type of ulcer (grade II). Therefore, the estimated average expense for grade II PU was R\$ 35.50. This value is underestimated, because it does not include other dressings that could not be tracked by the researchers of this study.

Table 2. Cost of grade II pressure ulcers dressing. Campinas, São Paulo, 2009/10.

GRADE II						
	Patient A	Patient B	Patient C	Patient D	Patient E	Total area
Code per item	35cm ²	37 cm ²	26 cm ²	50,25 cm ²	8 cm ²	153,25 cm ²
	Cost (R\$)					Total cost per item (R\$)
Kt	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Lpr	0,1060	0,4240	0,3180	0,3710	0,1060	1,3250
Les1	0,3070	1,2280	1,2280	1,2280	0,3070	4,2980
Les2	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Gz	0,2326	0,9340	1,6282	1,1630	0,2326	4,1868
Ag1	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Ag2	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Mcr	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
TR	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Be	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
AGE	0,5475	1,0950	1,0805	2,1900	0,4380	6,3510
Ac	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Pap	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
At1	0,3280	0,0000	0,9840	0,0000	0,0000	1,3120
At2	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
At3	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Fcr	0,0075	0,075	0,0392	0,0000	0,0000	0,0542
A.ort1	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
A.ort2	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
A.ort3	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
SF1	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
SF2	0,9500	0,0000	1,900	0,0000	0,0000	2,8500
SF3	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
SF4	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
SF5	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Nursing technician	0,4444	4,4440	9,9990	8,6658	1,1111	24,6643
Nurse	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Total	0,0,9230	9,2779	18,4883	14,4989	2,3981	47,5862

● **Grade III Pressure Ulcer**

According to NPUAP (2008), fatty tissue or subcutaneous tissue damage defines grade III PUs. The amount spent on dressings was R\$ 2.48 and the time spent was four minutes,

also performed by nursing technicians. Therefore, the expense was R\$ 0.89 per procedure. In an area of 3 cm², the cost was R\$ 0.83 for each cm². As this type of injury was a unique event observed, there is no need to calculate averages.

Table 3. Cost of grade III pressure ulcers dressing. Campinas, São Paulo, 2009/10.

GRADE III			
Patient A		Total Area	
3 cm ³		3 cm ³	
Code per item	Cost (R\$)	Total cost per item (R\$)	
Kt	0,0000	0,0000	
Lpr	0,0000	0,0000	
Les1	0,3070	0,3070	
Les2	0,0000	0,0000	
Gz	0,2326	0,2326	
Ag1	0,0000	0,0000	
Ag2	0,0000	0,0000	
Ag3	0,0000	0,0000	
Mcr	0,0830	0,0830	
TR	0,0000	0,0000	
Be	0,0000	0,0000	
AGE	0,3285	0,3285	
Ac	0,0000	0,0000	
Pap	0,0000	0,0000	
At1	0,1640	0,1640	
At2	0,0000	0,0000	
At3	0,0000	0,0000	
Fcr	0,0037	0,0037	
A.ort1	0,0000	0,0000	
A.ort2	0,0000	0,0000	
A.ort3	0,0000	0,0000	
SF1	0,0000	0,0000	
SF2	0,4750	0,4750	
SF3	0,0000	0,0000	
SF4	0,0000	0,0000	
SF5	0,0000	0,0000	
Nursing technician	0,8888	0,8888	
Nurse	0,0000	0,0000	
Total	2,4826	2,4826	

● **Necrosis**

This tissue injury is different from the rest, because nursing technicians and nurses participated simultaneously in the procedure, in an attempt to remove the tissue and expose the base of the wound. Its exact depth was not confirmed and for this reason there is no grade classification (based on the level of tissue damage), according to NPUAP (2008).

Seven dressing exchanges of this type were observed in only three patients, and two dressings were performed by nurses and nursing technicians simultaneously. The total expense was R\$ 59.29. The treatment for necrosis was carried out in a total of 63

minutes, but nurses and nursing technicians participated simultaneously during 38 minutes.

There was an average of 21 minutes per patient and nine minutes per dressing (the longest time spent among all other dressings), and time variations from three to 22 minutes. However, the cost of nurses' work (in 38 minutes) was R\$ 15.63 and technicians' work (in 63 minutes) was R\$ 14.00. The average cost per dressing was R\$ 8.47. The estimated average expense for necrosis was R\$ 76.23 within the period of this study.

Table 4. Cost of pressure ulcers with necrotic tissue dressing. Campinas, São Paulo, 2009/10.

Necrotic					
	per	Patient A	Patient C	Patient E	Total area
		13cm ²	2cm ²	42cm ²	57cm ²
Code item		Cost (R\$)			Total cost per item (R\$)
Kt		0,0000	3,8500	7,700	11,5500
Lpr		0,1060	0,1060	0,3710	0,5830
Les1		0,0000	0,3070	0,9210	1,2280
Les2		0,0000	0,0000	0,0000	0,0000
Gz		0,2326	0,4652	0,9304	1,6282
Ag1		0,0000	0,0340	0,0340	0,0680
Ag2		0,0000	0,0000	0,0000	0,0000
Ag3		0,0000	0,0000	0,0000	0,0000
Mcr		0,0000	0,1246	0,0000	0,1246
TR		0,0000	0,5100	0,0000	0,5100
Be		0,0000	0,4180	1,2540	1,672
AGE		0,3285	0,0000	0,8760	1,2045
Ac		0,0000	0,0000	0,0000	0,0000
Pap		0,0000	0,0000	4,4160	4,4160
At1		1,1640	0,0000	0,3280	0,4929
At2		0,0000	0,0000	0,0000	0,0000
At3		0,0000	0,0000	2,2880	2,2880
Fcr		0,0037	0,0000	0,0803	0,0840
A.ort1		0,0000	0,0000	0,0000	0,0000
A.ort2		0,0000	0,0000	0,0000	0,0000
A.ort3		0,0000	0,0000	0,4800	0,4800
SF1		0,0000	0,0000	0,3850	0,3850
SF2		0,4750	0,9500	0,0000	1,4250
SF3		0,0000	0,0000	0,0000	0,0000
SF4		0,0000	0,0000	0,0000	0,0000
SF5		0,0000	0,0000	0,0000	0,0000
Nursing technician		0,8888	0,0000	11,3322	12,2210
Nurse		0,0000	3,2904	15,6294	18,9198
Total		2,1986	10,0552	47,0253	59,2791

Table 5: Cost of all dressings observed. Campinas, São Paulo, 2009/10.

	Patient A	Patient B	Patient C	Patient D	Patient E	Patient F	
Code per item	Total Cost (R\$)						Total cost per item (R\$)
Kt	0,0000	0,0000	3,8500	0,0000	7,7000	0,0000	11,5500
Lpr	0,2120	0,4240	0,1060	0,3180	0,7420	0,1060	1,9080
Les1	0,6140	1,2280	0,3070	1,2280	2,1490	0,3070	5,8330
Les2	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Gz	0,6978	0,9304	0,4652	1,6282	2,0934	0,2326	6,0476
Ag1	0,0000	0,0000	0,0340	0,0000	0,3040	0,0000	0,3380
Ag2	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Ag3	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Mcr	0,0830	0,1370	0,1246	0,2014	0,2761	0,0934	0,9155
TR	0,0000	0,0000	0,5100	0,0000	0,0000	0,0000	0,5100
Be	0,0000	0,0000	0,4180	0,0000	1,2540	0,0000	1,6720
AGE	1,2045	1,0950	0,0000	2,0805	3,0660	0,4380	7,8840
Ac	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Pap	0,0000	0,0000	0,0000	0,0000	4,4160	0,0000	4,4160
At1	0,6560	0,0000	0,0000	0,9840	0,3280	0,0000	1,9680
At2	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
At3	0,0000	0,5720	0,0000	0,0000	2,2880	0,0000	2,8600
Fcr	0,0149	0,0075	0,0000	0,0392	0,0803	0,0000	0,1419
A.ort1	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
A.ort2	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
A.ort3	0,0000	0,0000	0,0000	0,0000	0,4800	0,0000	0,4800
SF1	0,0000	0,4400	0,0000	0,1100	0,9900	0,1100	1,6500
SF2	1,9000	0,0000	0,9500	1,9000	0,0000	0,0000	4,7500
SF3	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
SF4	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
SF5	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Nursing technician	0,2220	4,4440	0,0000	9,9990	19,9980	1,1111	37,7741
Nurse	0,0000	0,0000	3,2904	0,0000	15,6294	0,0000	18,9198
Total	7,6042	9,2779	10,0552	18,4883	2,3981	2,3981	101,6479

CONCLUSION

This study showed the importance of performing cost analyses for dressings. Undoubtedly, preventing is better than treating wounds, because it implies quality of life and well-being of patients.

By this research, it was possible to observe that necrosis dressing requires more time from nursing professionals (average of 21 minutes per patient and nine minutes per dressing) and highest average cost (almost R\$ 10.00). This is due to invasive procedures such as debridement which requires participation of nurses and nursing technicians simultaneously.

Grade II PUs were observed with greater frequency (70.4%) and for that reason, if they are not handled properly, they could progress to other stages, requiring a longer time and more material for dressing procedures, exposing patients to the risk of infection and compromising their rehabilitation.

Only one grade III PU dressing was observed. It would have been more appropriate to observe others of this type, but according to the Infirmary, there were no occurrences during this study.

Cost analyses, as performed in this study, can be carried out by using other types of methodologies and instead of estimating average cost data during a month, each patient could be observed in order to assess the evolution of more ulcers, or their healing. Certainly, this requires more time and exclusive dedication to research. Brazil is still incipient for expenses control studies and this work can promote researchers to carry out new research in this field.

REFERENCES

1. Rabeh SAN. Úlcera de pressão: a clarificação do conceito e estratégias para divulgação do conhecimento na literatura de enfermagem [dissertation]. Ribeirão Preto (SP): Escola de Enfermagem de Ribeirão Preto USP; 2001.
2. Pressure Ulcer Stages Revised by NPUAP [Internet]. 2007 Feb [cited 2007 Aug 5 2008]. Available from: <http://www.npuap.org/pr2.htm>
3. Costa MP, Sturtz G, Costa FPP, Ferreira MC, Filho TEPB. Epidemiologia e tratamento das úlceras de pressão: experiência de 77 casos. Acta ortop bras [Internet]. 2005 [cited 2012 July 03];13(3):124-33. Available from: <http://www.scielo.br/scielo.php?script=sc>

[i_arttext&pid=S1413-78522005000300005&lng=en&nrm=iso](http://dx.doi.org/10.1590/S1413-78522005000300005&lng=en&nrm=iso).
ISSN 1413-7852.Â
<http://dx.doi.org/10.1590/S1413-78522005000300005>.

4. Blanes L, Duarte IS, Calil JA, Ferreira LM. Avaliação clínica e epidemiológica das úlceras por pressão em pacientes internados no Hospital São Paulo. Revista Assoc Med Bras. 50(2):182-7.
5. Rogenski NMB, Santos VLCG. Estudo sobre a incidência de úlceras por pressão em um hospital universitário. Rev Latino-Am Enfermagem [Internet]. 2005 [cited 2012 July 3];13(4):474-80. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-11692005000400003&lng=en&nrm=iso.
ISSN 0104-1169. Â
<http://dx.doi.org/10.1590/S0104-11692005000400003>.
6. Castilho V, Leite MMJ. A Administração de recursos materiais na enfermagem. In: Kurcgant P. Administração de Enfermagem. São Paulo: EPU; 1991.p.73-88.
7. Castilho V, Fugulin FMT, Gaidzinski RR. Gerenciamento dos custos nos serviços de enfermagem. In: Kurcgant P. Administração de Enfermagem. Rio de Janeiro: Guanabara Koogan; 2005.p.171-83.
8. Sanches VF, Christovam BP, Silvino ZR. Processo de trabalho do gerente de enfermagem em unidade hospitalar - uma visão dos enfermeiros. Esc. Anna Nery [Internet]. 2006 Aug [cited 2012 July 3];10(2):[about 5 p.]. Available from: http://www.portalbvnsenf.eerp.usp.br/scielo.php?script=sci_arttext&pid=S1414-81452006000200007&lng=pt&nrm=isso
9. Felli VEA, Peduzzi M. O trabalho gerencial em Enfermagem. In: Kurcgant P. Gerenciamento de Enfermagem. Rio de Janeiro: Guanabara Koogan; 2005.p.1-13.
10. Beckrich K, Aronovitch AS. Hospital acquired pressure ulcers: a comparison of costs in medical vs. surgical patients. Nurs Econ [Internet]. 20... [cited 2012 July 3];17(5):263-71. Available from: http://findarticles.com/p/articles/mi_m0FSW/is_5_17/ai_n18609011/
11. Chiavenato I. Comportamento organizacional: a dinâmica do sucesso das organizações. São Paulo: Pioneira Thomson Learning; 2004.p.4-115.451-83.

Neves JF, Stancato K.

Pressure ulcers: a perspective of cost...

Sources of funding: No

Conflict of interest: No

Date of first submission: 2012/02/09

Last received: 2012/07/16

Accepted: 2012/07/17

Publishing: 2012/08/01

Corresponding Address

Ana Paula Costa Alves. Enfermeira
Rua Dentista Alexandrino Agra, 16 – Tanque
CEP: 22735-176 – Rio de Janeiro (RJ), Brazil

Kátia Stancato
Rua José Vilagelin Júnior, 64, Ap. 91
Cambuí
CEP: 13024-120 – Campinas (SP), Brazil