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USE OF THE AIR MATTRESS IN THE REDUCTION OF PRESSURE ULCERS: EFFICACY AND PERCEPTIONS OF NURSING

USO DO COLCHÃO PNEUMÁTICO NA REDUÇÃO DE ÚLCERAS POR PRESSÃO: EFICÁCIA E PERCEPÇÕES DA ENFERMAGEM

USO DEL COLCHÓN DE AIRE EN LA REDUCCIÓN DE LA ULCERA POR PRESIÓN: EFICÁCIA Y PERCEPCIONES DE LA ENFERMERÍA

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ABSTRACT

Objective: to evaluate the effectiveness of the air mattress in reducing pressure ulcers in the coronary unit of a referral hospital for cardiology. **Method:** Cross-sectional, retrospective, descriptive, exploratory study with a quantitative approach carried out at the Epidemiology and Infection Control (NEPI-CCIH) and in coronary care units I and II of the University Cardiac Emergency Room of Pernambuco - Prof. Luiz Tavares/PROCAPE. The Ethics Committee in Research, CAAE No 12292213.2.0000.5194, approved the research project. **Results:** the mattresses were effective in reducing the incidence of pressure ulcers, showing a rate of 55.3% when comparing years 2011 and 2012. The opinion of the nursing staff about the effectiveness of the mattress showed positive results in the majority of the interviewed (98.6%), but 48.8% of professionals did not know the technology before the implementation. **Conclusion:** there is the need to update the teams working in intensive care for the use of air mattresses. **Descriptors:** Pressure Ulcer; Nursing Evaluation; Nursing; Intensive Care.

RESUMO

Objetivo: avaliar a eficácia do colchão pneumático na redução de úlceras por pressão nas unidades coronarianas de um hospital de referência em cardiologia. **Método:** estudo transversal, retrospectivo, descritivo-exploratório, com abordagem quantitativa, realizado no Núcleo de Epidemiologia e Controle de Infecção (NEPI-CCIH) e nas unidades coronarianas I e II do Pronto-Socorro Cardiológico Universitário de Pernambuco - Prof. Luiz Tavares/PROCAPE. O projeto de pesquisa foi aprovado pelo Comitê de Ética em Pesquisa, CAAE nº 12292213.2.0000.5194. **Resultados:** os colchões apresentaram-se eficazes na redução da incidência das úlceras por pressão, apontando uma taxa de 55,3% quando comparados os anos de 2011 e 2012. A opinião da equipe de enfermagem quanto à eficácia do colchão mostrou resultado positivo na maioria dos entrevistados (98,6%), porém foi observado que 48,8% dos profissionais não conheciam a tecnologia antes de sua implantação. **Conclusão:** há necessidade de atualização das equipes que trabalham em terapia intensiva para o uso dos colchões pneumáticos. **Descritores:** Úlcera por Pressão; Avaliação em Enfermagem; Cuidados de Enfermagem; Terapia Intensiva.

RESUMEN

Objetivo: evaluar la eficacia del colchón de aire en la reducción de úlceras por presión en las unidades coronarias de un hospital de referencia en cardiología. **Método:** estudio transversal, retrospectivo, descriptivo-exploratorio, con enfoque cuantitativo, realizado en el Núcleo de Epidemiología y Control de Infección (NEPI-CCIH) y en las unidades coronarias I y II de la Emergencia Cardiológica Universitaria de Pernambuco - Prof. Luiz Tavares/PROCAPE. El proyecto de investigación fue aprobado por el Comité de Ética en Investigación, CAAE nº 12292213.2.0000.5194. **Resultados:** los colchones se presentaron eficaces en la reducción de la incidencia de las úlceras por presión, mostrando una tasa de 55,3% cuando comparados a los años de 2011 y 2012. La opinión del equipo de enfermería sobre la eficacia del colchón mostró resultado positivo en la mayoría de los entrevistados (98,6%), sin embargo fue observado que 48,8% de los profesionales no conocían la tecnología antes de su implantación. **Conclusión:** hay necesidad de actualización de los equipos que trabajan en terapia intensiva para el uso de los colchones de aire. **Descriptores:** Úlcera por Presión; Evaluación en Enfermería; Cuidados de Enfermería; Terapia Intensiva.

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INTRODUCTION

Risk factors predispose the individual to prolonged periods of ischemia induced by pressure reducing the ability of tissue recovery from the ischemic injury and may be associated with intrinsic or extrinsic factors.¹ Injuries by pressure worry and discourage patients and are a gateway to infection, hindering recovery, increasing the time required for nursing care and therefore costs, increasing mortality in some patients. The loss of skin integrity produces significant consequences for the individual, the institution and the community.²

The prevalence of pressure ulcers has increased in recent years due to increased life expectancy of the population, associated with the advances of modern medicine, making possible the survival of patients with serious diseases and before lethal, transforming into chronic diseases and slowly wasting.¹ Despite these advances in health care, pressure ulcer is still an important cause of morbidity and mortality and impact on quality of life of patients and their families, creating a social and economic problem.³ More than one million people develop pressure ulcers each year.⁴ Taking into account the pressure ulcers, the prevalence in a given sector is defined as the number of clients with at least one pressure ulcer that exists in a population of patients in a given time.⁵

Some risk factors are the most important for the development of pressure ulcers, condition imposing physical, emotional and social overload on the patients and their family. The patient feels unmotivated to continue the treatment becoming susceptible to the deterioration in quality of life, implying increased costs for health care, as special dressings and medications, when staying longer in the hospital and predisposing the patient to prolonged periods of ischemia induced by pressure, reducing the ability of ischemic tissue injury recovery and increasing morbidity and mortality by infections.⁶

Immobility, malnutrition, anemia, edema, drug vasoconstriction, altered level of consciousness, incontinence and vascular disorders increase the developing of pressure ulcers, causing additional problems such as pain, suffering and increased mortality and morbidity, longer the time and cost of hospitalization.⁷ The lack of mobility is one of the risk factors for pressure ulcers, enabling the presence of local pressure on bony prominences without alternations, having tissue malnutrition.⁸

Tissue injury by pressure is a wound that causes suffering and discomfort, being avoided and minimized using systematization of nursing care to define the changes in position, protocols for prevention of ulcers with technological covers reducing the risk of friction and shear and the bony prominences, aid risk scales already translated and validated and the use of alternating pressure mattresses helping in the continuous change of pressure in the bony prominences and alleviating blood flow, reducing the possibility of ischemia area.⁹

Reducing or relieving pressure is the most important prophylactic measure and it can be achieved by proper positioning of the patient in bed and reducing the use of pressure devices.¹⁰ The position changing is needed to relieving and redistributing pressure on the skin, allowing the flow of blood into the ischemic areas and helping in the recovery of tissue from the effects of pressure. Many times it is necessary the use of pressure relief devices, especially patients for bedridden and who have risk factors as a preventive way to relieve pressure on bony prominences, preventing the development of pressure ulcers.¹¹

The system can reduce the working time of nurses' professionals, giving mobility and changing the position of the bedridden often, to allow them to do other activities. Another advantage is the savings in materials and hospital equipment, because with the prevention of pressure ulcers, it is possible to avoid the many complications that would occur in their presence, reducing the consumption and use of resources in the health area.

The use of mattresses with redistributed surface of pressure on hospital beds and operating tables decreases the possibility of new lesions. Although it requires more investment, it can be cost-effective decreasing the time of hospitalization.³ To prevent pressure ulcers, there are various mattresses available in the market using a fluid substance to ease and redistribute the pressure body on a surface. In addition to preventing the diseases, these mattresses also ensure support of the body more comfortably. Among the fluids used in these applications are water, air or special gels. There are also models that use alternating pressure between the body and the mattress by inflation and deflation of air in pneumatic pockets. Pressure control in these pockets is usually by some sort of electronic system.

OBJETIVE

● To evaluate the effectiveness of the use of air mattress in reducing pressure ulcers in coronary care units of a cardiology hospital referral.

METHOD

Descriptive, cross-sectional, retrospective study with a quantitative approach carried out at the Epidemiology and Infection Control (NEPI-CCIH) and in coronary care units I and II of the University Cardiac Emergency Room of Pernambuco - Prof. Luiz Tavares (PROCAPE). The PROCAPE is a cardiology referral service in the Northeast that attend patients of the Unified Health System (SUS), with the mission to provide humanized service to the population and develop research in cardiology area.

In the first step, we did a survey of the records of all patients who were hospitalized in the coronary care units I and II between January 2011 and December 2012, to calculate the incidence rate of pressure ulcers (PU). in two semesters of 2011 and the incidence rate of UPP in both semesters of 2012. In 2011, there was no use of air mattress. The next step, there were in the study all employees of nursing activity in areas agreeing to sign an informed consent form (ICF). The inclusion criterion of professional and higher education was to have a working time in the unit, at least 24 months, excepting those in official license throughout the collection period. The interviews were by

a professional proper questionnaire elaborated by the researchers.

The Center for Epidemiology of PROCAPE provided the data from the first step collected through medical records. The calculation of the incidence of ulcers was using the formula: $I = (\text{in pressure ulcers} \times 100) / \text{number of exposed patients}$. After the second stage of data collection (questionnaire), data went to an Excel table, of Microsoft Windows, Version 2007 for descriptive analysis. The compilation of data was using Epi-info software. Statistical analysis was using nonparametric *chi-square test and Fisher's exact test proportions*, comparing the numerical and categorical variables, adopting a significance level of p value of <0.05.

The study guidance was by the CNS Resolution 196/96, in force during the period of review and approval of the Foundation of Higher Education of Olinda (FUNESO) Research Ethics Committee, and obtained a favorable opinion by CAAE No 12292213.2.0000.5194.

RESULTS

With the evaluation of infection control records of patients hospitalized to the coronary care units, we clearly visualized 55.4% reduction in the incidence of pressure ulcers (above stage II of evolution), comparing the periods 2011 (before mattresses use) and 2012 (after use).

Table 1. Incidence and reduction of pressure ulcers in the sample of patients hospitalized to the coronary care units of a university hospital. Recife-PE, 2013.

2011 - Bedore the mattresses use				2012 - Using the mattresses			
Months	n	Hospitalizations	f	n	Hospitalizations	f	Reduction
Jan	11	UC 1 = 41 UC 2 = 48	12,3%	7	UC 1 = 35 UC 2 = 60	7,3%	40,6%
Feb	11	UC 1 = 42 UC 2 = 54	11,4%	7	UC 1 = 37 UC 2 = 60	7,2%	36,8%
Mar	10	UC 1 = 30 UC 2 = 42	13,8%	7	UC 1 = 35 UC 2 = 63	7,1%	48,5%
Apr	12	UC 1 = 35 UC 2 = 63	12,2%	5	UC 1 = 40 UC 2 = 43	6%	49,2%
May	10	UC 1 = 34 UC 2 = 60	10,6%	1	UC 1 = 32 UC 2 = 47	1,2%	88,6%
Jun	12	UC 1 = 16 UC 2 = 37	22,6%	2	UC 1 = 38 UC 2 = 42	2,5%	89%
Jul	10	UC 1 = 37 UC 2 = 48	11,7%	5	UC 1 = 42 UC 2 = 56	5,1%	56,4%
Aug	7	UC 1 = 46 UC 2 = 73	5,8%	4	UC 1 = 40 UC 2 = 50	4,4%	24,1%
Sept	10	UC 1 = 43 UC 2 = 57	10%	1	UC 1 = 20 UC 2 = 49	1,4%	86%
Oct	8	UC 1 = 35 UC 2 = 69	7,7%	5	UC 1 = 47 UC 2 = 50	5,1%	33,8%
Nov	7	UC 1 = 49 UC 2 = 51	7%	2	UC 1 = 55 UC 2 = 40	2,1%	70%
Dic	6	UC 1 = 35 UC 2 = 56	6,5%	4	UC 1 = 47 UC 2 = 50	4,1%	37%
Total	114	1.101	10,3%	50	1.078	4,6%	55,4%

In the evaluation of the monthly incidence of pressure ulcers in the period from January-December 2011 and 2012, we ca see the quantity of pressure ulcers developed in monthly units and quantitative coronary patients exposed for each month. A significant reduction is in all months when comparing 2011 (before mattresses use) with 2012 (after the mattresses use), and the months with higher reduction were May (88.6%), June (89%), September (86%) and November (70%).

In the annual evaluation, there were 114 pressure ulcers, for 1,101 patients exposed to the two coronary care units, showing 10.3% incidence of pressure ulcers. In 2012, there were 50 pressure ulcers for 1,078 patients exposed to the two coronary care units, with a 4.6% incidence of pressure ulcers. When comparing 2011 and 2012, there was a decrease of 55.4% of pressure ulcers after the mattress use. (Table 1)

Table 2. Characteristics of the sample of participants of the nursing staff of the coronary care units of a university hospital. Recife-PE, 2013

	n	%
Professional class		
Nurse	15	21,7
Technician Nurse	54	78,3
Gender		
Male	7	10,14
Female	62	89,86
Age		
Under 35 years old	25	36,23
From 36 and 50 years old	42	60,87
More than 50 years old	2	2,90
Time of graduation (years/average±dp):		
Team	13,78±5,06	
Nurse	13,13±4,73	
Technician Nurse	13,96±5,12	
Time working in the area (years/average±dp):		
Team	5,95±1,55	
Nurse	6,06±1,53	
Technician Nurse	5,92±1,57	

The sample consisted of 69 nurses, with 15 nurses (21.7%) and 54 technician nurses (78.3%). Patients were predominantly female (89.86%) and aged between 36 and 50 years old (60.87%). Regarding the time of graduation, there was no significant

difference between the classes, with an average of 13.78 years of staff training (± 5.06 years). The average time working in coronary care units was 5.95 ± 1.55 years, with no difference between the classes. (Table 2)

Table 3. Opinion of the nursing staff on the use of air mattress in coronary care units of a university hospital. Recife-PE, 2013

About air mattress:		Team		Nurses		Technicians		p
		n	%	n	%	n	%	
Did you Know it before using?	Yes	36	52,2	10	66,7	26	48,1	0,328*
	No	33	47,8	5	33,3	28	51,9	
Is it comfortable for the patient?	Yes	60	87	11	73,3	49	90,7	0,181*
	No	9	13	4	26,7	5	9,3	
Did you perceive reduction in the rate of UPP? ***	Yes	65	94,2	14	93,3	51	94,4	0,63**
	No	4	5,8	1	6,7	3	5,6	
Does it help to relieve pressure on the prominences?	Yes	68	98,6	15	100	53	98,1	0,78**
	No	1	1,4	0	0	1	1,9	

* Chi-square test ** Fisher exact test *** pressure ulcer

Regarding the answers about the use of air mattresses in the coronary unit (Table 3), there was no statistically significant difference found in the classes. Only 52.2% knew the mattress, its statements and how to use it before presented to the coronary care unit of the hospital (p = 0.328).

On the second question, 87% of the team found the mattress a comfortable device to

the patient (p = 0.181). Regarding the perception of reducing the incidence of pressure ulcers in the unit, 94.2% of the team reported efficiency (p = 0.63). Most of the team (98.6%) felt that the air mattress makes a significant contribution to the relief of pressure in the areas of bony prominence (p = 0.78), as shown in Table 3.

Table 4. Analysis of team answers about the use of air mattress by the time of graduation and the working time in the area. Recife-PE, 2013.

About the air mattress		Tme of graduation		p	Time in the area		p
		Under 12 years	More than 12 years		Under 6 years	More than 6 years	
Did you Know it before using?	Yes	16	20	0,93*	20	16	0,34*
	No	15	18		22	11	
Is it comfortable for the patient?	Yes	30	30	0,3**	38	22	0,23**
	No	1	8		4	5	
Did you perceive reduction in the rate of UPP? ***	Yes	30	35	0,38**	40	25	0,511**
	No	1	3		2	2	
Does it help to relieve pressure on the prominences?	Yes	31	37	0,55**	41	27	0,6**
	No	0	1		1	0	

* Chi-square Test ** Fisher exact Test

DISCUSSION

It is important to report that there was no change to protocols or changes in nursing care and no variation in the number of hospitalization between the years studied. In units where prevention protocols are well employed as changing positions and other types of mattress or resources, the reduction after use of pressure redistribution mattresses present lower values.¹²⁻⁴

National studies show that there is the recognition of the use of air mattress by nurses, such as a way to prevent the formation of ulcers.¹⁵⁻⁶

This fact shows that the complexity of nursing care provided in the ICU, the dynamics and the monitoring of information that determine and alter the therapeutic approach to patients require adequate and continuous preparation of nurses. Therefore, managerial action is the search for the maintenance and promotion of staff training, showing that skilled and trained professionals produce better results.¹⁷

In this way, we have to think and encourage continuous learning and training of nurses, because we understand that they must continually learn in their training and in their practice, taking responsibility and commitment to their education, as well as the future generations of professionals. Continuing education is a more effective and safe strategy against high values of hospitalization and treatment of patients suffering from pressure ulcers.

Clinical competence is very important both for nurses working in the critical care unit and for the employing institutions and patients of health services. Careful evaluation, from the beginner or the experienced nurse, should be developed, so that the cognitive and psychomotor skills can be objectively evaluated. After all, the bigger goal should

always for promoting a high quality of patient care.

When evaluated the answers as a function of time formed and length of service in the unit, there was no statistically significant difference (Table 4). Training time was not influential factor that led to the team perception regarding the use of the mattress. This is a result of mattresses technology with pressure switch not being part of the reality of large public hospitals in the state. Therefore, the incentive for nursing research and frequent participation in conferences and meetings can broaden the knowledge of innovative technologies found in the world's major hospital centers, besides contributing to the expansion of knowledge of the team.

The training is for the professional the knowledge resulting from education, training and experience, in the sense that it may have a certain function. Therefore, the better the training, the greater the probability of being competent in performing their functions.

CONCLUSION

The perception of the nursing team about the effectiveness of the mattress showed positive results in the majority of respondents (98.6%), but a moderate amount of professionals do not yet know (47.8%) the technology of mattresses with alternating pressure before implantation, demonstrating the need to update the teams working in intensive care.

The mattresses are effective in reducing the incidence of pressure ulcers, with a reduction of 55.4% when comparing 2011 and 2012. With the training team for the correct use of the device, the decrease of incidence of pressure ulcers is greater.

It is suggested to have multidisciplinary teams within hospitals working together to encourage evidence based in solutions, bringing scientific discoveries to reality and

the daily practice of the institutions. Teams training with teams are needed to identify individuals at risk of developing pressure ulcers, using a protocol of preventative measures presented during training and also to identify the critical factors for development of pressure ulcers.

It is necessary to health professionals being involved in evaluating the quality of products and equipment used in the units showing their efficacy. There are intensively training and development programs in organizations, in order to promote better functional performance and maintain competitiveness for the sustainability of organizations in the market.

We suggest the use of air mattress associated with daily evaluation of the risk of damage through scales predictions of risk (such as Braden scale) and the protection of bony prominences with technological products, as well as routinely changing positions.

There is a need to invest in upgrades at the hospital about the latest equipment and technologies applied in intensive care units. The work of untrained workers interferes directly on the expected results of production and measured through indicators of productivity and quality in organizations.

REFERENCES

1. Wanda A, Teixeira Neto N, Ferreira MC. Úlceras por pressão. Rev Med [serial on the internet]. 2010 [cited 2013 July 22];89(3/4):170-7. Available from: <http://www.revistademedicina.org.br/ant/89-3/14-ulceras%20pressao.pdf>
2. Schue RM, Langemo DK. Pressure Ulcer Prevalence and incidence and a modification of Braden scale for rehabilitation unit. J. Wound Ostomy Continence Nurs [serial on the internet]. 1998 [cited 2013 July 22];25(1):36-43. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/9481286>
3. Luz SR, Lopacinski AC, Fraga R, Urban CA. Úlceras por pressão. Geriatr Gerontol [serial on the internet]. 2010 [cited 2013 July 22];4(1):36-43 Available from: <http://www.sbgg.org.br/profissionais/arquivo/revista/volume4-numero1/artigo06.pdf>
4. Wound, Ostomy and Continence Nurses Society (WOCN). Guideline for prevention and management of pressure ulcers. WOCN Clinical Practice Guidelines Series. Glenview (IL): WOCN; 2003 [cited 2013 July 22]. Available from:
5. Wound, Ostomy and Continence Nurses Society (WOCN). Prevalence and incidence: a toolkit for clinicians Glenview (IL): WOCN; 2004 [cited 2013 July 22]. Available from: http://c.ymcdn.com/sites/www.wocn.org/resource/resmgr/Archives/Prevalence_&_Incidence_-_A_T.pdf
6. Souza DMST, Santos VLGC. Fatores de Risco Para o Desenvolvimento de Úlceras por Pressão em Idosos Institucionalizados. Rev Latino-Am Enfermagem [serial on the internet]. 2007 [cited 2013 July 22]; 15(5). Available from: http://www.scielo.br/pdf/rlae/v15n5/pt_v15n5a11
7. Allman R, Goode PS, Burst NBS, Bartolucci AA, Thomas DR. Pressure ulcers, hospital complications, and disease severity: Impact on hospital costs and length of stay. Adv Wound Care [serial on the internet]. 1999 [cited 2013 July 22];12:22-30. Available from: http://journals.lww.com/aswcjournal/Abstract/1999/01000/Pressure_Ulcers,_Hospital_Complications,_and.8.aspx
8. Marin MJS, Pereira EACS, Paula MIR, Mesquita SRM, Laluna MC. Avaliando o risco para úlcera de pressão em uma população do município de Marília. Enferm Atual. 2002;2(7):28-33.
9. Wada A, Neto NT, Ferreira MC. Úlceras por pressão. Rev Med [serial on the internet]. 2010 [cited 2013 Aug 6];89(3/4):170-7. Available from: <http://www.revistademedicina.org.br/ant/89-3/14-ulceras%20pressao.pdf>
10. D'arco C, Sassine SW, Costa MLM, Silva LMG. Úlcera de pressão em UTI. In: Knobel E. Condutas no paciente grave. 3a. ed. São Paulo: Atheneu; 2006. Vol. 2. p. 2491-501.
11. Rogenski NMB, Kurcgant P. Incidência de úlceras por pressão após a implementação de um protocolo de prevenção. Rev latinoam enferm [serial on the internet]. 2012 [cited 2013 Aug 6]; 20(2):1-7. Available from: http://www.scielo.br/pdf/rlae/v20n2/pt_16.pdf
12. Rich SA, Shardell M, Hawkes WG, Margolis DJ, Amr S, Miller R, Baumgarten M. Pressure-Redistributing Support Surface Use and Pressure. Ulcer Incidence in Elderly Hip Fracture Patients J Am Geriatr Soc [serial on the internet]. 2011 [cited 2013 July 22];59(6):1052-9. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3601674/pdf/nihms449397.pdf>
13. Vanderwee K, Grypdonck MHF, Defloor T. Effectiveness of an alternating pressure air

mattress for the prevention of pressure ulcers. Age Ageing [serial on the internet]. 2005 [cited 2013 July 22];34(3):261-7. Available from: <http://ageing.oxfordjournals.org/content/34/3/261.full.pdf>

14. Saha S, Smith MEB, Totten A, Fu R, Wasson N, Rahman B, Motu'apuaka M, Hickam DH. Pressure Ulcer Treatment Strategies: Comparative Effectiveness. Agency for Healthcare Research and Quality. 2013 [cited 2013 July 22]. Report No.: 13-EHC003-EF. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK143657/pdf/TOC.pdf>

15. Dantas ALM, Araújo JDB de, Ferreira PC. Prevenção de úlceras por pressão segundo a perspectiva do enfermeiro intensivista. J Nurs UFPE on line [serial on the internet]. 2013 [cited 2013 July 22];7(1):706-12, 2013. Available from: http://www.revista.ufpe.br/revistaenfermagem/index.php/revista/article/view/3630/pdf_2151

16. Valença MP, Lima PO, Pereira MM, Santos RB. Percepção dos enfermeiros sobre a prevenção das úlceras por pressão em um Hospital Escola da cidade do Recife. Rev enferm UFPE on line [serial on the internet]. 2010 [cited 2013 July 6];4(2):673-82. Available from: http://www.ufpe.br/revistaenfermagem/index.php/revista/article/view/852/pdf_54

17. Bucchi SM, Mira VL, Otrenti E, Ciampone MHT. Enfermeiro instrutor no processo de treinamento adimensional do enfermeiro em unidade de terapia intensiva. Acta Paul Enferm [serial on the internet]. 2011 [cited 2013 July 22];24(3):381-7. Available from: <http://www.scielo.br/pdf/apv/v24n3/12.pdf>

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