

INTRAVENOUS THERAPY IN HOSPITALIZED OLDER ADULTS: CARE EVALUATION

Ana Cláudia Roman Rós¹, Daniela Ramos Oliveira², Raquel Debon¹, Maira Scaratti¹

ABSTRACT: The aim of this study was to evaluate the nursing care related to peripheral intravenous therapy in older adults hospitalized or under observation in a teaching hospital in southern Brazil, between August and September 2016. This prospective quantitative study evaluated intravenous therapy infection prevention measures, by means of an instrument based on the recommendations of the Brazilian Health Regulatory Agency. The study included 80 patients with a mean age of 70.7 years, 51 (63.7%) of whom were male. The identification was adequate in 15 (18.8%) of the venous accesses and the correct completion of the labels was not identified for any solution evaluated. The dressing for catheter fastening was unclean in 29 (36.3%) cases and the incidence of phlebitis occurred in six (7.5%) patients. It was concluded that there are nonconformities, which impact on the safety of the hospitalized patient, requiring monitoring of the quality of care and ongoing education of the professionals.

DESCRIPTORS: Older adult; Quality of healthcare; Nursing care; Patient safety; Hospital infection.

TERAPIA INTRAVENOSA EM IDOSOS HOSPITALIZADOS: AVALIAÇÃO DE CUIDADOS

RESUMO: Objetivou-se avaliar os cuidados de enfermagem na terapia intravenosa periférica em idosos internados ou em observação em um hospital-escola do sul do Brasil, nos meses de agosto e setembro de 2016. Pesquisa de natureza quantitativa prospectiva, avaliando as medidas de prevenção de infecção na terapia intravenosa, por meio de instrumento baseado nas recomendações da Agência Nacional de Vigilância Sanitária. Participaram do estudo 80 pacientes com idade média de 70,7 anos, sendo 51 (63,7%) do sexo masculino. A identificação estava adequada em 15 (18,8%) dos acessos venosos e o preenchimento correto dos rótulos não foi identificado em nenhuma solução avaliada. O curativo de fixação do cateter apresentava sujidade em 29 (36,3%) casos e a incidência de flebite ocorreu em seis (7,5%) pacientes. Concluiu-se que há inconformidades, que interferem na segurança do paciente hospitalizado, requerendo monitoramento da qualidade de assistência e educação permanente dos profissionais.

DESCRIPTORIOS: Idoso; Qualidade da assistência à saúde; Cuidados de enfermagem; Segurança do paciente; Infecção Hospitalar.

TERAPIA INTRAVENOSA EN ANCIANOS QUE ESTÁN EN HOSPITAL: EVALUACIÓN DE CUIDADOS

RESUMEN: Estudio cuyo objetivo fue evaluar los cuidados de enfermería en terapia intravenosa periférica de ancianos internados o en observación en un hospital-escuela de sur de Brasil, en los meses de agosto y septiembre de 2016. Investigación cuantitativa prospectiva que analizó las medidas de prevención de infección en la terapia intravenosa, por medio de instrumento que considera las recomendaciones de la Agencia Nacional de Vigilancia Sanitaria. Participaron del estudio 80 pacientes con edad media de 70,7 años, siendo 51 (63,7%) del sexo masculino. La identificación estaba adecuada en 15 (18,8%) de los accesos venosos y no se completó correctamente ninguno de los rótulos de la solución evaluada. El apósito de fijación del cateter presentaba suciedad en 29 (36,3%) casos y hubo incidencia de flebitis en seis (7,5%) pacientes. Se concluye que hay disconformidades que influyen en la seguridad del paciente hospitalizado, lo que hace necesario monitorar la cualidad de asistencia y educación permanente de los profesionales.

DESCRIPTORIOS: Anciano; Cualidad de la asistencia a la salud; Cuidados de enfermería; Seguridad del paciente; Infección Hospitalaria.

¹Registered Nurse. Resident in Older Adult Health and Cancer Care. University of Passo Fundo. Passo Fundo, RS, Brazil.

²Registered Nurse. MSc. in Human Aging. Professor of the Integrated Multidisciplinary Residency Program in Older Adult Health and Cancer Care of the University of Passo Fundo. Passo Fundo, RS, Brazil.

Corresponding author:

Ana Cláudia Roman Rós
Universidade de Passo Fundo
R. Paissandu 1932 - 99010-102 - Passo Fundo, RS, Brasil
E-mail: ana.claudiaros@gmail.com

Received: 28/12/2016

Finalized: 16/05/2017

● INTRODUCTION

Aging is due to a multifactorial process that encompasses changes in all systems of the body and, therefore, care for older adult patients differs from that of adult patients⁽¹⁾. In the year 2060, older adults will reach 75.1 million people, representing 32.9% of the Brazilian population, that is, one in three Brazilians will be 60 years of age or older⁽²⁾.

According to projections, older adults tend to contribute to the increase in health care spending, which will go from 27% of the total in 2010 to 58% in 2050⁽³⁾. Hospitalization will represent 60% of these costs in 2050⁽³⁾. This population tends to consume more medications, since senescence is related to morphophysiological changes, greater susceptibility to the development of chronic diseases and a greater incidence of injuries. Consequently, they use a large share of the health services⁽⁴⁾.

Older adult patients have high morbidity and greater chances of mortality compared to younger individuals. When associated with infections, the chances of mortality increase further⁽⁵⁾. The risk of developing health-related infections, especially in the bloodstream, rises⁽⁶⁾. The majority of vascular access infections are related to the central venous catheter, however, the monitoring of infections related to peripheral devices is considered important⁽⁷⁾.

Peripheral intravenous therapy is used in the treatment of hospitalized patients, this being a routine procedure for nursing professionals⁽⁸⁾. It involves the placement of an intravenous device into a peripheral vein and the introduction of intravenous solutions according to the needs of each patient. Its main adverse events are phlebitis and extravasation of fluids into the interstitial compartment, which may cause damage to the venous network⁽⁹⁾.

Professionals are vulnerable, with a risk of becoming co-responsible for care-related infections⁽¹⁰⁾. This poses major challenges to public health, which requires adequacy of services, availability of physical structure, specific technologies and trained professionals⁽¹¹⁻¹²⁾.

With progress in the development of treatments and drugs, peripheral intravenous therapy is becoming increasingly complex, increasing the risks of complications for patients⁽¹³⁾. Thus, knowing these risks, seeking elements regarding safe practices and being aware of signs and symptoms of complications in order to prevent and treat them should be a priority for nurses.

There are deficits in the national and international literature on the particularities of older adult care regarding peripheral intravenous therapy and this directly affects the quality and safety of the nursing care to this population, as the specific guidelines are not corroborated by experimental, clinical or epidemiological studies⁽¹⁴⁾.

Thus, this study aimed to evaluate nursing care regarding peripheral intravenous therapy in older adult patients hospitalized or under observation in a teaching hospital in southern Brazil.

● METHOD

This was a quantitative prospective study, with older adult patients, hospitalized or under observation in three nursing units of a teaching hospital in southern Brazil, these being the: Urgency and Emergency, Hemodynamic Study and Clinical Surgical Inpatient units. The choice of these units was due to the fact that they attended mostly older adults.

The hospital in which the data collection took place is philanthropic, with 631 inpatient beds, and attends high complexity cases, being a referral center for the other municipalities of the region.

Patients 60 years of age or older, on continuous or intermittent peripheral intravenous therapy for more than 96 hours, were included in the study. Sedated patients with neurological alterations were excluded.

Data collection took place in August and September 2016 using an instrument designed for the study based on the recommendations of the Brazilian Health Regulatory Agency, from the booklet Measures to Prevent Healthcare Related Infection⁽¹⁵⁾. Each subject was evaluated once, with an average

duration of 15 to 20 minutes.

The items evaluated by the researchers were: presence of sterile material used for fastening/dressing of the peripheral venous access (PVA); dressing of the PVA identified with the date, time and employee's signature; Presence of dirt in the dressing of the PVA; Recording in the medical record when the routine change in the PVA was not performed every 96 hours; validity of equipment (96 hours) and solutions (24 hours) by means of labels; identification of solution labels; and presence of signs of phlebitis (redness, heat, pain and edema) at the time of evaluation.

The patients were asked about some items due to the impossibility of evaluation during the application of the instrument, the questions being clear, using simple language, with demonstrations performed in some cases. The questions were: which instrument was used to remove the hair before puncture of the PVA?; during bathing is the PVA protected with plastic?; is there a daily palpation examination of the PVA?; is disinfection of the valved device performed with cotton and alcohol before connecting the syringe or solutions?.

The data was entered in a Microsoft Excel® 2010 spreadsheet and analyzed using the statistical software of the Statistical Package for the Social Sciences® (SPSS) version 22.0. For the quantitative variables, the measures of central tendency and dispersion were calculated. The absolute and relative simple frequencies of the data were reported.

The study was carried out after approval from the Research and Post-Graduation Committee of the hospital where the data collection took place and approval of the Research Ethics Committee of the University of Passo Fundo, under authorization No. 1.647.147.

The study complied with Resolution 466/12 of the National Health Council⁽¹⁶⁾; followed the Code of Ethics of Nursing Professionals; and fulfilled the ethical aspects of consent of the hospital; guaranteeing confidentiality, anonymity and respect for the values of the research participants.

● RESULTS

The study included 80 patients with a mean age of 70.7 years, 51 (63.7%) of whom were male. Regarding the unit, 26 (32.5%) were in the Urgency/Emergency, 26 (32.5%) in the Clinical Surgical Inpatient and 28 (35%) in the Hemodynamic Study units.

Table 1 - Measures to prevent healthcare related infection in peripheral intravenous therapy. Passo Fundo, RS, Brazil, 2016

ITEMS EVALUATED	SECTORS EVALUATED						
	Urgency and Emergency n=26 n (%)		C/S Inpatient Unit n=26 n (%)		Hemodynamic Study n=28 n (%)		Total (n=80) n (%)
	Yes	No	Yes	No	Yes	No	Yes
Identification of the dressing	3 (11.5)	23(88.5)	8 (30.8)	18 (69.2)	4 (14.3)	24(85.7)	15(18.8)
Daily assessment of the insertion site	23(88.5)	3 (11.5)	21 (80.8)	5 (19.2)	16 (57.1)	12 (42.9)	60 (75)
Catheter protection during bathing	2 (9.5)	19 (90.5)	2 (8.3)	22 (91.7)	6 (15)	18 (75)	10 (14.5) *
Disinfection of the valved device	7 (70)	3 (30)	3 (30)	7 (70)	-	-	10 (50) **
Equipment within the validity period	10 (62.5)	6 (37.5)	21 (87.5)	3 (12.5)	10(100)	-	41 (82) ***
Continuous solution within the validity period	10 (71.4)	4 (28.6)	17 (85)	3 (15)	9 (90)	1 (10)	36 (81.9) ****

* Patients who performed a shower (n=69); ** Patients with valved device (n=20); *** Patients who had continuous or intermittent solution equipment (n=50); **** Patients using continuous solution (n=44).

A total of 50 continuous and intermittent solution labels were evaluated and 100% were not filled in with patient name, bed, name of solution, amount to be infused, date of installation, time and professional's signature. The remaining patients had salinized PVA, used only at the time of medication administration.

In ten patients (8%) the hair had been removed for insertion of the venous device, of these, two (20%) reported the use of electric clippers, as recommended. In 17 patients (23%) the PVA was not changed after 96 hours, as is routinely recommended, with there being no registration in the medical record regarding the conditions and permanence of the device.

For the fastening of the catheter, sterile coverings were not used in the study institution, with this being a recommendation. The presence of dirt in the fastening was observed in 29 (36.3%) patients. When evaluated by nursing unit, of the 26 Urgency/Emergency patients, 13 (50%) presented dirt in the dressing; in the Inpatient Unit, of the 26 patients evaluated, 10 (38.5%) presented dirt; however, the Hemodynamic Study Unit was the one with the lowest incidence of dirt in the dressings, with six (21.4%).

The occurrence of adverse events related to the peripheral intravenous therapy (phlebitis/fluid extravasation) occurred in six patients (7.5%), with a similar incidence in the sectors analyzed (two in each sector).

● DISCUSSION

Published national studies on adherence to bloodstream infection prevention measures, related to peripheral intravenous therapy, involving only the older adult population, were not found, these being more focused on the adult or pediatric populations.

In this study, there was a predominance of male patients, similar to a publication that evaluated the quality of nursing care related to peripheral intravenous therapy, the sample of which had 57.47% of men⁽¹⁷⁾. The male population seeks hospital care more, due to conditions of harm to health, since men tend to present less adherence to preventive measures⁽¹⁸⁾.

Regarding adequate identification of vascular access, the compliance with completion was low, with only 15 (18.8%) being adequate. Conversely, according to a study carried out in a hospital located in São Paulo state, of the 720 observations, 79.2% of the peripheral venous accesses were correctly identified⁽¹⁹⁾.

In the present study, 60 (75%) patients reported daily evaluation of the peripheral venous access (PVA) by a nursing professional. The daily inspection of the peripheral venous access aims to evaluate the catheter conditions, as well as the presence of phlogistic signs suggestive of infection, this being basic nursing care⁽¹⁵⁾.

When questioned about the care of the PVA during bathing, only 10 (14.5%) patients had their devices protected with a waterproof cover. The use of an impermeable cover during bathing is recommended, as well as its exchange whenever it is dirty, wet or its integrity is compromised⁽²⁰⁾.

The disinfection of the valved device occurred in 10 (50%) patients that used this type of connection. The recommendation is to rub at least three times using an alcohol solution prior to accessing the device. It is also necessary to monitor the incidence of infection after the introduction of valved devices⁽¹⁵⁾.

The percentage of equipment and solutions within the validity period was 82%, as presented in Table 1. In cases where the equipment or solutions of the patients were found to be out-of-date, the researchers informed the nurse manager to arrange for them to be changed. A study carried out in two different hospitals evaluated five indicators of nursing quality related to peripheral intravenous therapy, among which the results were only safe for the identification and validity of the equipment and solution bottle indicators⁽²¹⁾.

Conversely, in the present study, the correct identification of the labels of the solutions was

zero, which can be related to the fact of ignorance of its importance by the nursing team, as well as to work overload. The professionals responsible for the care need ongoing education regarding recommendations for measures to prevent infection of the bloodstream and therefore contribute to patient safety.

It can be verified that the tricotomy was not performed correctly in the units evaluated, that is, the removal of the hair using the appropriate device did not occur. This may be related to the fact that not all the units had electric clippers. The use of this device is strongly recommended by the Centers for Disease Control and Prevention (CDC)⁽²⁰⁾.

In this study, in 17 patients (21.3%) the PVA was not changed after 96 hours, as is routinely recommended, with there being no registration in the medical record regarding the conditions and permanence of the device. Anvisa recommends that, in cases in which the catheter was not replaced, the conditions and permanence of the catheter should be registered in the medical records of the patient⁽¹⁵⁾. In Brazil, catheter replacement has been empirically indicated by the Hospital Infection Control Commissions of each institution⁽¹⁷⁾.

To routinely change the peripheral venous catheter every 72-96 hours in adults and older adults is recommended, however, when clinically indicated. This is still an unresolved issue, suggesting that more studies are needed, except for in the pediatric area⁽²⁰⁾. According to the Anvisa recommendations, in neonatal and pediatric patients, the PVA should not be routinely changed and should remain until the intravenous therapy is completed, unless clinically indicated⁽¹⁵⁾.

Some authors report the use of the peripheral venous catheter for a three-week period with no complications, considering that routine replacement causes many unnecessary invasive procedures. They highlight that the policy of routine change of peripheral venous catheters has been applied for four decades, during which the quality and durability of the catheter material has evolved⁽²²⁾.

In the institution evaluated, the use of a sterile cover for peripheral venous catheter fastening is not recommended. Adequate antisepsis of the skin before venipuncture is extremely important, as is the fastening of the catheter with sterile adhesive, preferably transparent and in a way that provides it with stability⁽⁹⁾. The use of sterile dressing is strongly recommended⁽²⁰⁾. Anvisa also recommends that material that comes into contact with the catheter insertion site should be sterile, however, it does not indicate the category of recommendation⁽¹⁵⁾.

Another relevant issue was the presence of dirt in the catheter fastening, with this being identified in 29 (36.3%) of the patients. Thus, questions arise regarding how the professionals evaluate the covers of the fastening, for the risk of infections and injuries, as well as the guidelines that the patient receives about the care with this device.

The incidence of adverse events (phlebitis and extravasation) was 7.5% in this study, occurring in six patients, with no predominance in a specific unit. This proportion was higher than the 5% considered to be an acceptable standard, according to the recommendations of the Infusion Nurses Society⁽²³⁾. Some authors have reported an incidence of phlebitis of 31.1%, with them describing that the institutions studied did not adopt the use of sterile dressings and suggesting this as a factor related to the high proportion of phlebitis⁽²⁴⁾. Care in the maintenance of access, control of infusions, prevention of complications and constant monitoring are among the main actions that promote efficacy and safety in intravenous therapy⁽²⁵⁾.

Professionals seek the best for their patients, however, due to the fact that the service is linked to the complex interactions between people, facilities, equipment and medicines, there is a high chance of error⁽²⁶⁾. Another important question is how professionals understand the older adult and how this impacts on the way the nursing care is performed⁽²⁷⁾.

There is no comprehensive diagnosis of the problems related to peripheral intravenous therapy in older adult patients. This demonstrates the need to evaluate quality indicators, as well as the requirement for ongoing education of health professionals to reinforce the safety culture in hospitals.

● FINAL CONSIDERATIONS

When analyzing the items of safe practices in peripheral intravenous therapy care, nonconformities were identified, which directly interfere with the safety of the hospitalized patient. Peripheral intravenous therapy is widely used in hospitals, however, little discussed in the context of older adult patients. This study presented some limitations, as the nursing professionals were not evaluated nor the factors that impact on the quality of the care provided.

Monitoring of the care quality is necessary in the hospital environment, as is reflecting on the practice based on what is observed, listing points that need improvement, investing in the continuing education of health professionals and reinforcing the patient safety culture.

● REFERENCES

1. Abrass IB, Kane RL, Ouslander JG, Resnick B. Fundamentos de geriatria clínica. 7a ed. Porto Alegre: Artmed; 2015.
2. Alves JED. Transição demográfica, transição da estrutura etária e envelhecimento. Revista Portal de Divulgação. [Internet] 2014;(40) [acesso em 20 jan 2016]. Disponível: <http://www.portaldoenvelhecimento.com/revista-nova/index.php/revistaportal/article/view/440/440>.
3. Carneiro LAF, Campino ACC, Rodrigues FLCC, Santos GMM, Silva ARA. Instituto de Estudos de Saúde Suplementar (Org.). Envelhecimento populacional e os desafios para o sistema de saúde brasileiro. [Internet] São Paulo: IESS; 2013 [acesso em 10 fev 2016]. Disponível: <http://documents.scribd.com/s3.amazonaws.com/docs/1itre3bsjk3sac05.pdf>.
4. da Silva EA, Macedo LC. Polifarmácia em idosos. Revista Saúde e Pesquisa. [Internet] 2013;6(3) [acesso em 03 mar 2016]. Disponível: <http://periodicos.unicesumar.edu.br/index.php/saudpesq/article/view/2862>.
5. Dimopoulos G, Koulenti D, Blot S, Sakr Y, Anzueto A, Spies C, et al. Critically ill elderly adults with infection: analysis of the extended prevalence of infection in intensive care study. J Am Geriatr Soc. [Internet] 2013;61(12) [acesso em 10 mar 2016]. Disponível: <http://dx.doi.org/10.1111/jgs.12544>.
6. de Sousa MAS, Lima TR, de Sousa AFL, Carvalho MM, Brito GMI, Camilotti A. Prevalência de infecção da corrente sanguínea em idosos internados em um Hospital Geral. Rev. Pre. Infec e Saúde. [Internet] 2015;1(3) [acesso em 15 mar 2016]. Disponível: <http://www.ojs.ufpi.br/index.php/nupcis/article/view/4252>.
7. Agência Nacional de Vigilância Sanitária (BR). Critérios Diagnósticos de Infecções Relacionadas à Assistência à Saúde. Brasília: Ministério da Saúde; 2013.
8. Batista OMA, Coelho SNOA, de Oliveira GM, Madeira AZA, Vieira CPB, dos Santos AMR. Fatores de risco para as complicações locais da terapia intravenosa periférica. Rev Enferm UFPI. [Internet] 2014;3(3) [acesso em 6 abr 2016]. Disponível: <http://www.ojs.ufpi.br/index.php/reufpi/article/view/1540>.
9. Harada MJCS, Pedreira MLG. Terapia intravenosa e infusões. São Caetano do Sul: Yendis; 2011.
10. Ataídes FS, Abrão FY, Costa CR, Silva MRR, Pimenta FC, Palos MAP, et al. Identificação de espécies de Candida em saliva de profissionais da saúde. Rev. Eletr. Enf. [Internet] 2010;12(3) [acesso em 10 abr 2016]. Disponível: <http://dx.doi.org/10.5216/ree.v12i3.6472>.
11. Brito MCC, Freitas CASL, de Mesquita KO, Lima GK. Envelhecimento Populacional e os Desafios para a Saúde Pública: Análise da Produção Científica. Revista Kairós Gerontologia. [Internet] 2013;16(2) [acesso em 10 abr 2016]. Disponível: <http://revistas.pucsp.br/index.php/kairos/article/view/18552/13738>.
12. Ribeiro MG, Sancho LG, do Lago RF. Gastos com internação do idoso em serviços privados de terapia intensiva em três capitais da região sudeste: São Paulo, Rio de Janeiro e Belo Horizonte. Cad. saúde colet. [Internet] 2015;23(4) [acesso em 20 abr 2016]. Disponível: <http://dx.doi.org/10.1590/1414-462X201500040096>.
13. Modes PSSA, Gaíva MAM, Rosa MKO, Granjeiro CF. Cuidados de enfermagem nas complicações da punção

venosa periférica em recém-nascidos. *Rev. Rene.* 2011;12(2):324-32.

14. Oliveira DFL, Azevedo RCS, Gaiva MAM. Guidelines for intravenous therapy in elderly: a bibliographic research. *J. res.: fundam. care. online.* [Internet] 2014;6(1) [acesso em 20 abr 2016]. Disponível: <http://dx.doi.org/10.9789/2175-5361.2014v6n1p86>.

15. Agência Nacional de Vigilância Sanitária (ANVISA). Medidas de Prevenção de Infecção Relacionada à Assistência à Saúde. Brasília: ANVISA; 2013.

16. Ministério da Saúde (BR). Conselho Nacional de Saúde. Diretrizes e Normas Regulamentadoras de pesquisas envolvendo seres humanos. Brasília. Resolução nº 466, de 12 de dezembro de 2012. Brasília; 2012.

17. de Souza AEBR, Oliveira JLC, Dias DC, Nicola AL. Nursing care quality in peripheral intravenous therapy: analysis by indicators. *Cogitare Enferm.* 2014;19(3):478-84.

18. Cunha BSS, Nascimento AS, Sá SPC. Perfil clínico e sociodemográfico de internação de idosos na unidade de emergência de um hospital geral. *Estud. interdiscipl. envelhec.* 2014;19(1):189-200.

19. Caldana G, Gabriel CS, Bernardes A, de Pádua RX, Vituri DW, Rossaneis MA. Avaliação da qualidade de cuidados de enfermagem em hospital público. *Semina: Ciências Biológicas e da Saúde.* [Internet] 2013;34(2) [acesso em 25 abr 2016]. Disponível: <http://dx.doi.org/10.5433/1679-0367.2013v34n2p187>.

20. O'Grady NP, Alexander M, Burns LA, Dellinger EP, Garland J, Heard SO, et al. Guideline for the prevention of intravascular catheter-related bloodstream infections. [Internet] Atlanta: CDC; 2011 [acesso em 15 jan 2016]. Disponível: <https://www.cdc.gov/hicpac/BSI/BSI-guidelines-2011.html>.

21. Murasaki ACY, Versa GLGS, Bellucci Júnior JAB, Meireles VC, Vituri DM, Matsuda LM. Avaliação de cuidados na terapia intravenosa: desafio para a qualidade na enfermagem. *Esc. Anna Nery.* [Internet] 2013;17(1) [acesso em 02 fev 2016]. Disponível: <http://dx.doi.org/10.1590/S1414-81452013000100002>.

22. Rickard CM, Webster J, Wallis MC, Marsh N, McGrail MR, French V, et al. Routine versus clinically indicated replacement of peripheral intravenous catheters: a randomised controlled equivalence trial. *Lancet.* [Internet] 2012;380(9847) [acesso em 01 mai 2016]. Disponível: [http://dx.doi.org/10.1016/S0140-6736\(12\)61082-4](http://dx.doi.org/10.1016/S0140-6736(12)61082-4).

23. Infusion Nurses Society. Infusion nursing standards of practice. *J Infus Nurs.* 2006;29(Suppl 1):S1-92.

24. Enes SMS, Opitz SP, de Faro ARMC, Pedreira MLG. Phlebitis associated with peripheral intravenous catheters in adults admitted to hospital in the Western Brazilian Amazon. *Rev. esc. enferm. USP.* [Internet] 2016;50(2) [acesso em 04 mai 2016]. Disponível: <http://dx.doi.org/10.1590/S0080-623420160000200012>.

25. Cardoso JMRR, Rodrigues EC, Rodrigues BMRD, Pacheco STA, Faria JCO. Escolha de veias periféricas para terapia intravenosa em recém-nascidos pela equipe de enfermagem. *Rev. Rene.* 2011;12(2):365-73.

26. Wachter R. *Compreendendo a Segurança do Paciente.* 2ª ed. Porto Alegre: AMGH; 2013.

27. Schimidth TCG, da Silva MJP. The perception and understanding of health professionals and undergraduate students regarding aging and the elderly. *Rev. esc. enferm. USP.* 2012;46(3):612-17.