

Factors that influence the time of hospitalization in kidney transplantation

Factores que influyen en el tiempo de hospitalización en el trasplante de riñón

Fatores que influenciam o tempo de internação no transplante renal

ABSTRACT

Objective: Identify the elements that interfere with the length of hospital stay for kidney transplant patients. **Method:** This is a cross-sectional and retrospective study conducted at a hospital in Fortaleza. 236 medical records of transplant patients were analyzed between 2017 and 2019. An electronic spreadsheet was used to organize the data, which were later analyzed using the Statistical Package for the Social Sciences program. **Results:** It was found that the majority had the underlying disease of unknown etiology, diabetes and hypertension. Of the 236 patients, 40.3% had immediate graft function, 80.9% did not have any infection, with an average of 11 days of hospitalization. Those who had normal creatinine spent less days in the hospital. **Conclusion:** Creatinine, late graft function and infection were factors directly related to the length of hospital stay, and it is essential that professionals seek strategies to avoid and / or minimize complications in the post-transplant period.

DESCRIPTORS: Hospitalization; Hospitalization time; Kidney Transplantation;

RESUMEN

Objetivo: Identificar los elementos que interfieren con la duración de la estancia hospitalaria de los pacientes con trasplante de riñón. **Método:** Se trata de un estudio transversal y retrospectivo realizado en un hospital de Fortaleza. Se analizaron 236 historias clínicas de pacientes trasplantados entre 2017 y 2019. Se utilizó una hoja de cálculo electrónica para organizar los datos, que luego se analizaron mediante el Paquete Estadístico del Programa de Ciencias Sociales. **Resultados:** Se encontró que la mayoría tenía la enfermedad de base de etiología desconocida, diabetes e hipertensión. De los 236 pacientes, el 40,3% tenía función inmediata del injerto, el 80,9% no presentaba infección, con un promedio de 11 días de hospitalización. Aquellos que tenían creatinina normal pasaron menos días en el hospital. **Conclusión:** La creatinina, la función tardía del injerto y la infección fueron factores directamente relacionados con la duración de la estancia hospitalaria, siendo fundamental que los profesionales busquen estrategias para evitar y / o minimizar las complicaciones en el postrasplante.

DESCRIPTORES: Hospitalización; Tiempo de hospitalización; Trasplante de riñón;

RESUMO

Objetivo: Identificar os elementos que interferem no tempo de internação do paciente transplantado renal. **Método:** Trata-se de um estudo transversal e retrospectivo realizado em um hospital de Fortaleza. Foram analisados 236 prontuários de pacientes transplantados, entre 2017 e 2019. Utilizou-se uma planilha eletrônica para organização dos dados, que posteriormente foram analisados no programa Statistical Package for the Social Sciences. **Resultados:** Constatou-se que a maioria possuía a doença de base de etiologia desconhecida, diabetes e hipertensão. Dos 236 pacientes, 40,3% tiveram função imediata do enxerto, 80,9% não apresentaram nenhum foco de infecção, com média de 11 dias de internação. Aqueles que apresentaram creatinina normal passaram menos dias internado. **Conclusão:** A creatinina, a função tardia do enxerto e infecção foram fatores diretamente relacionados com o tempo de internação hospitalar, sendo essencial que os profissionais busquem estratégias para evitar e/ou minimizar as complicações no pós-transplante.

DESCRIPTORIOS: Hospitalização; Tempo de Internação; Transplante Renal;

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INTRODUCTION

Transplantation is a reliable and highly effective therapeutic option that aims to provide rehabilitation and increase the quality of life in patients with organ or tissue failure. Among the different types of transplants performed is the kidney transplant.¹

Kidney transplantation (KT) is indicated for patients with a Glomerular Filtration Rate (GFR) less than 15ml/min, whether or not on dialysis. It offers longer survival, better quality of life and, sometimes, it is the only resource to maintain the individual's life.²

This is the treatment of choice for many patients suffering from end-stage renal disease (ESRD) and has few contraindications. It is known that the survival advantage of KT compared to hemodialysis (HD) for patients with ESRD is well established, mainly due to the post-transplant quality of life and the different costs of the two replacement therapies.^{3,4}

KT is considered a simple surgical procedure and after implantation, some essential interventions are needed to maintain the graft, such as the use of immunosuppressive drugs, hygiene care and infection prevention, in addition to post KT follow-up, which starts right

after the patient arrival in the Intensive Care Unit (ICU) and extends throughout life.⁴

It is noteworthy that, even though TxR is an alternative with numerous benefits, it can lead to relevant complications, among which we can mention: delayed graft function (DGF), hypovolemia, acute tubular necrosis (ATN), hyperacute and acute rejection, nephrotoxicity by cyclosporine calcineurin inhibitors and vascular occlusion.⁵

Another common complication is post-transplant infection, which is related to modulation of the recipient's immune system, being considered the second leading cause of death among patients with chronic renal failure and responsible for more than 50% of postoperative complications.⁶ Thus, the length of hospital stay and the quality of postoperative care are considered risk factors for infections.⁷

It is understood that all these complications result in a prolonged process in the recovery of graft function and, consequently, contribute to an increase in hospital stay, which may also contribute to the occurrence of infection, resulting in worse long-term graft survival and the patient's health conditions.⁸

Reducing the length of hospital stay (LHS) is crucial to reducing the risks inhe-

rent to prolonged hospitalization. Prolonged hospitalization is one of the problems that most harms the health system. Since, the patient is subject to unnecessary risks, such as psychological changes, risk of infection, sleep disorders, among other disorders. In addition, prolonged hospitalization influences and increases the financial costs borne by the hospital.⁹

With regard to KT, the average hospital stay corresponds to 11 days of hospitalization. Prolonged hospitalization is considered to be for patients who remained in hospital for more than 12 days after transplantation.¹⁰ Thus, considering the relevance of KT, the study aimed to identify the elements that interfere with the length of stay of the kidney transplant patient.

METHOD

This is a cross-sectional and retrospective study. The sample consisted of patients undergoing kidney transplantation from a deceased donor in a hospital in Fortaleza, which is a reference in organ and tissue transplantation, from June 2017 to June 2019, aged between 18 and 78 years old.

Data collection was carried out from January to May 2020. 236 medical records of kidney transplant patients who underwent transplantation in that insti-

tution were evaluated. Patients who met the inclusion criteria, kidney transplantation with deceased donor and exclusion criteria, double pancreas-kidney transplantation, medical records with insufficient information to carry out the research, recipients under 18 years of age and death after transplantation were selected.

Sociodemographic data, comorbidities, underlying disease that led to kidney failure, time on dialysis, creatinine before the transplant, creatinine on the day of hospital discharge, late graft function (LGF), number of post-transplant HD, graft function were evaluated. , rejection, infection and

LHS (from the day of transplantation to the day of hospital discharge).

Quantitative data were entered using an Excel 2003 for Windows spreadsheet, and these data were later submitted to statistical analysis using the Statistical Package for Social Sciences (SPSS version 23.0). Descriptive statistics were performed for qualitative variables using absolute and relative frequencies. For continuous and discrete quantitative variables, the mean, standard deviation (SD), median, minimum and maximum were calculated. The normality of the variables was verified by the Kolmogorov-Smirnov test.

To analyze the intervening factors in the days of hospitalization among research participants, we sought to stratify the length of hospital stay into normal (up to 11 days) and prolonged (over 11 days). The association between the variables creatinine value, graft function, time on HD (before transplant), number of post-transplant HD, comorbidities, infections and the outcome of days of hospitalization (normal or prolonged) were evaluated by the chi test. -Pearson's square, with a value of $p < 0,05$ being considered statistically significant, the strength of this association by calculating the odds ratio (Odds Ratio – OR) and logistic regression using the backward method to adjust the model. For input of the variables in the model, $p < 0,20$ was considered and for its permanence, $p < 0,05$.

This study was approved by the Research Ethics Committee of Hospital Geral de Fortaleza, under opinion 3.348.699.

RESULTS

Continuous variables were presented as mean, standard deviation and variance. Categorical variables were presented as frequency and percentage. The sample consisted of 236 kidney transplant patients, with a mean age of $46,8 \pm 13,8$ years, 144 (61%) were male, brown (202; 85,6%) and from the interior of the state (114; 48,3%). Regarding marital status, 143 (60,6%) were married, 71 (30,1%) were single, and the others were divorced, in a stable relationship or widowed (12, 4, 6, respectively). With regard to education, most had completed high school (104; 44,1%), 84 (35,3%) attended elementary school, 31 (13,1%) had higher education and the others were illiterate (17; 7,2%).

The underlying disease that most led the patient to renal failure was of unknown etiology (37,7%), followed by Diabetes Mellitus (17,8%) and glomerulopathies (16,9%). Regarding comorbidities associated with the underlying disease, 60,6% of patients with renal failure had SAH. In addition, about 20,3% had concomitant SAH and DM.

Tabela 1 – IMC, doença de base, comorbidades e tempo em diálise dos pacientes antes do transplante (n=236)

VARIÁVEIS	N	(%)	MÉDIA ± DP
IMC			24,89 ±4,46
Normal (18-24)	110	46,6%	
Baixo peso (<18)	14	5,9%	
Sobrepeso (25-29,9)	77	32,6%	
Obeso (>30)	35	14,8%	
Doença de base			
DM	42	17,8%	
HAS	27	11,4%	
Glomerulopatias	40	16,9%	
Doença Policística Renal	16	6,8%	
Doença urológica/Bexiga neurogênica	8	3,4%	
Etiologia desconhecida	89	37,7%	
Outros	14	5,9%	
Comorbidades			3,5 ±8,17
Sem comorbidades	29	12,3%	
DM	7	3%	
HAS	143	60,6%	
DM+HAS	48	20,3%	
Problemas vasculares	5	2,1%	
Outras	4	1,7%	
Tempo em diálise (pré TxR)			
Preemptivo	15	6,4%	
Até 12 meses	15	6,4%	
De 12 a 36 meses	89	37,7%	
>36 meses	117	49,6%	

Fonte: Dados da pesquisa, 2021. n – número total; % porcentagem; DP- Desvio Padrão; IMC- Índice de Massa Corporal; HAS- Hipertensão Arterial Sistêmica; DM- Diabetes Mellitus;

The mean creatinine of recipients before TxR was $7,8 \pm 3,6$ mg/dl, with a large variance of 13,1 mg/dl. As for creatinine on the day of hospital discharge, the mean was $3,1 \pm 2,3$ mg/dl, with a smaller variance, 5,7 mg/dl.

Of the 236 patients, 95 (40,3%) had immediate graft function (IGF). However, 7 (3%) patients had graft rejection, with a mean of 44 LHS, ranging from 15 to 94 days. Most participants did not have LGF (152; 64,4%), 2 of them

had graft loss due to postoperative complications and 82 (34,7%) patients had LGF, with a mean of $2 \pm 4,2$ HD post KT, with a large variance of 18,3.

Infection is among the factors that contribute to the increase in hospital stay. About 190 (80,9%) patients had no focus of infection after KT. The other patients had urinary focus infection (23; 9,8%), surgical wound infection (8; 3,4%), respiratory infection (3; 1,3%) and other infectious foci (11; 4,7%).

The days of hospitalization of patients participating in this research ranged from three to 139 days, with a median of 11 days. Thus, it was observed that most patients (130; 55,1%) were hospitalized for a normal period and 106 (44,9%), for an extended period.

Regarding the associations between the variables and the outcome days of hospitalization (normal and prolonged) (Table 1), there was a significant association between LGF ($p < 0,001$) and IGF ($p < 0,001$), creatinine value ($p < 0,001$), rejection ($p < 0,001$) and infection ($p < 0,001$) with the days of hospitalization. Only slow function and loss (graft function) variables did not enter the regression model.

As shown in Table 2, only the creatinine value ($p = 0,012$; OR = 0,230[0,070-0,810]), infection ($p < 0,001$; OR=15,568[5,613-43,178]) and IGF ($p < 0,001$; OR=5,183[2,136-12,576]) and LGF ($p = 0,001$; OR=0,172[0,076-0,391]).

The creatinine value proved to be a protective factor in the participants of this research, that is, those who had creatinine within normal values spent fewer days hospitalized. Patients who had LGF did not have longer hospital stays, even though this is one of the factors that can increase hospitalization days. Of those who had LGF, 25,2% dialyzed between 1 and 6 times after KT. Patients who had some infection and IGF were 15,568 and 5,183 times more likely, respectively, to remain hospitalized for a long time.

Tabela 2. Fatores intervenientes no tempo de internação (normal ou prolongado)

VARIÁVEIS	DIAS DE INTERNAÇÃO				P-VALOR	OR (IC95%)C
	NORMAL		PROLONGADO			
	N	%	N	%		
Comorbidades					0,109a	
Sim	110	53,1	97	46,9		0,51 (0,22-1,17)
Não	20	69,0	09	31,0		1
Função do enxerto						
FTE					0,001a	
Sim	15	18,5	66	81,5		0,07 (0,04-0,15)
Não	115	74,2	40	44,9		1
Função lenta					0,624a	
Sim	33	57,9	24	42,1		1,16 (0,63-2,12)
Não	97	54,2	82	45,8		1
Imediata					0,001a	
Sim	81	85,3	14	14,7		10,86 (5,58-21,11)
Não	49	34,8	92	65,2		1
Perda					0,445b	
Sim	01	33,3	02	66,7		0,40 (0,03-4,50)
Não	129	55,4	104	44,6		1
Creatinina					0,001a	
Alta	102	50,0	102	50,0		7,00 (2,37-20,67)
Normal	28	87,5	04	12,5		1
Rejeição					0,001b	
Sim	-	-	07	100		2,31 (1,99-2,68)
Não	130	56,8	99	43,2		1
HD antes do TxR					0,113a	
Até 3,2 meses	76	59,8	51	40,2		1,51 (0,90-2,54)
Acima de 3,2 meses	54	49,5	55	50,5		1
HD pós-transplante					0,001a	
Sim	17	20,7	65	79,3		10,53 (5,54-20,03)
Não	113	73,4	41	26,6		1
Infecção					0,001a	
Sim	07	13,7	44	86,3		0,80 (0,03-0,18)
Não	123	66,5	62	33,5		1

Legenda: a = Qui-Quadrado de Pearson; b = Razão de Verossimilhança; c = Odds ratio (intervalo de confiança de 95%); TxR= Transplante Renal. Fonte: Elaboração própria.

DISCUSSION

In general, the sample studied was predominantly male, with a mean age of $46,8 \pm 13,8$ years, most with high school education, corroborating the data presented in the survey conducted by Magalhães et al. (2019) and Dantas and collaborators (2020), who also showed a predominance of males, with a mean age of 42 years, with a higher standard deviation between $\pm 14-17,5$ years.

The underlying disease that most led patients to chronic kidney disease was of unknown etiology, followed by DM, glomerulopathies and SAH, respectively. This corroborates the data found in the study by Sandes-Freitas et al. (2015) and Baid-Agrawal et al. (2016), in which DM, SAH and glomerulopathies were also the main causes of kidney damage that led the patient to transplantation.^{11,13} This leads to a concern related to the development of LGF, as recipients who had SAH and DM as the underlying disease are more likely to develop this complication. Likewise, DM was a risk factor for kidney graft loss at 1 year, as well as a risk factor associated with mortality.^{14,15}

Only 29 patients had no comorbidity other than the underlying disease. Most recipients (143, 60,6%) had only SAH as a comorbidity, and about 20.3% had DM associated with SAH. Regarding the time on dialysis, only a small group did not undergo dialysis before transplantation (15, 6,4%). However, most patients (117, 49,6%) spent a long period on dialysis, longer than 36 months. The same data was also found in another research, in which the time in dialysis before KT it's more than 60 months.^{2,16} The other recipients who had this treatment for a period of 12 to 36 months (89; 37,7%). Only a small minority managed to transplant before 12 months of dialysis. Therefore,

other studies indicate that patients who had the longest average time on dialysis had LGF and a higher risk of death after KT.^{12,17}

The study sample in question showed that 95 patients had FIE and did not present LGF (152; 64,4%). The literature reinforces that patients with IGF have a significantly better evolution during the first year of transplantation and greater graft survival than patients with LGF.¹⁸

A multivariate analysis showed that retransplantation, donor age, final serum creatinine, cold ischemia time and immunosuppressive regimen were the variables independently associated with LGF. In this context, it is noteworthy that there is still a high number of recipients presenting LGF (82; 34,7%), which may trigger an acute rejection. This becomes even more relevant when there is an increase in LHS due to LGF.¹⁹ According to the research by Sandes-Freitas et al. (2015), the incidence of acute rejection at 6 months was 3 times higher in patients with LGF compared to patients without LGF. The same study found that most episodes of acute rejection occurred during the LGF period.^{12,20} Thus, it was observed that there was an increased risk of rejection and lower graft survival in those patients who had LGF, which was also observed in the study by Helfer et al. (2019).²¹ The data presented reinforce the negative impact that LGF has on transplant outcomes and confirm the risk of its occurrence.²²

Infection is among the factors that contribute to the increase in hospital stay.¹⁹ About 190 (80,9%) patients had no focus of infection after KT. The other patients had urinary focus infection (23; 9,8%), surgical wound infection (8; 3,4%), respiratory infection (3; 1,3%) and other infectious foci (11; 4,7%).

It is known that the infection is closely related to the highest LHS.

23 Analyzing the results obtained, it was observed that 44 patients who had infection had prolonged hospital stay, and only 7 had infection but did not exceed 11 LHS. Data from the study by Corrêa et al. (2013) indicate that there was a statistically significant association between rejection and infection. The same study shows that 44,1% of patients who developed infection had rejection and 28,8% had no rejection. Regarding patients without infection, 71,2% had no rejection and 55,9% yes. The data presented reinforce the importance of reducing LHS, thus reducing the risk of infection and complications after KT.

The median of LHS was 11 days, thus, it was observed that most patients (130; 55,1%) were hospitalized for a normal period and 106 (44,9%), for an extended period. According to Santos et al. (2016), a higher occurrence of rejection is related to longer hospital stays. Other characteristics of the recipient are also associated with longer residence time, such as increasing age, time on HD, retransplantation, DM and others.^{23,5}

Prolonged LHS is associated with higher rates of rejection and infection.⁸ Which leads to the analysis of all factors that influence the increase in the patient's length of stay, thus increasing the chances of complications in post KT. In the present study, the creatinine value proved to be a protective factor in the participants of this research, that is, those who showed a greater decline in the creatinine value to within normal values, spent fewer days hospitalized. What diverges from the literature are patients who had LGF but did not have longer hospital stays, even though this is one of the factors that can increase hospitalization days.

CONCLUSION

It is essential that health profes-

sionals know the factors that influence the evolution, the length of stay of the patient and seek strategies to avoid and/or minimize complications in the post-transplant period. The study data reveal that most of the results obtained corroborate research already carried out and published. In summary, immediate graft function,

late graft function, infection and post-renal transplant recipient serum creatinine are directly related to length of hospital stay. These were the elements identified as intervening factors in the length of hospital stay after kidney transplantation.

Even so, some factors that increase the length of hospital stay may be

related to the profile of recipients, environmental conditions, care practices, surgical techniques, and especially the donor. Despite the results presented, more robust and qualified research is still needed to assess the results with more variables, in order to add to the studies already carried out. ■

REFERENCES

1. Clementino J, Campos R, Gonzaga H, Neves H, Machado M, Carvalho P. Atuação do enfermeiro na organização para procura de órgãos: estudo de caso único institucional. *Saúde Coletiva (Barueri)*. 2020;10(58):3959–70.
2. Magalhães ALP, Campos TS, Lima VGG, Lins SMSB, Souza E. Adesão à terapia imunossupressora de transplantados renais de um hospital universitário. *Saúde Coletiva (Barueri)*. 2019;9(51):1892–8.
3. Silva, SB, Caulliraux, HM, Araújo, CAS, & Rocha, E. Uma comparação dos custos do transplante renal em relação às diálises no Brasil. *Cadernos de Saúde Pública*. 2016; 32: e00013515.
4. Santos LF, Prado, BDC, Castro, FPDS, Brito, RF, Maciel, SC, & Avelar, TC. Qualidade de Vida em Transplantados Renais. *Psico-usf*. 2018; 23(1): 163–172.
5. Carolline A, Torres O, Helena B, Lembi BK, Isidoro S, Fernandes FP, et al. Complicações pós-operatórias em pacientes submetidos a transplante renal: uma revisão narrativa. *Rev Eletrônica Acervo Saúde*. 2021;13(4):1–7.
6. Starck E, Mittelmann TH, Lovatto MVP, Nakalski LR, Abate DTRS. Complicações infecciosas no primeiro ano pós-transplante renal. *Brazilian J Dev*. 2020;6(6):36663–76.
7. Maia N, Parada B, Dinis P. Tempo de Isquemia Fria e a Incidência de Complicações Infecciosas após o Transplante Renal. *Fac Med da Univ Coimbra*. 2017;3(17):1–22.
8. Santos W, Rocha F, Ribeiro I, Coqueiro J. Atuação do enfermeiro nas complicações decorrentes do transplante renal: uma revisão de literatura. *Rev Uningã Rev*. 2016;25(1):136–42.
9. Silva RP, Pinto PIP, Alencar, AMC. Efeitos da hospitalização prolongada: o impacto da internação na vida paciente e seus cuidadores. *Saúde (Santa Maria)*. 2018; 3(44).
10. Yazawa M, Cseperekal O, Helmick RA, Talwar M, Balaraman V, Podila PS, Molnar MZ. Association between longer hospitalization and development of de novo donor specific antibodies in simultaneous liver–kidney transplant recipients. *Renal failure*. 2020; 42(1): 40–47.
11. Dantas GC, Galão JA, Pompeo LL, Titenis LV, de Souza FL, Uscocovich VSM. Comparação Da Evolução Pós-Operatória Precoce Em Pacientes Submetidos A Transplante Renal Com Rins De Doadores Vivos E Falecidos, Na Cidade De Cascavel-Pr. *Fag Journal Of Health (Fjh)*. 2020; 2(2), 172–179.
12. Sandes-Freitas TV, Felipe CR, Aguiar WF, Cristelli MP, Tedesco-Silva H, Medina-Pestana JO. Prolonged delayed graft function is associated with inferior patient and kidney allograft survivals. *PLoS One*. 2015; 10(12), e0144188.
13. Baid-Agrawal S, Martus P, Feldman H, Kramer H. Weekend versus weekday transplant surgery and outcomes after kidney transplantation in the USA: a retrospective national database analysis. *BMJ Open*. 2016; 6: e010482.
14. Ruppel P, Felipe CR, Medina-Pestana JO, Hiramoto LL, Viana L, Ferreira A, et al. The influence of clinical, environmental, and socioeconomic factors on five-year patient survival after kidney transplantation. *J Bras Nefrol*. 2018;40(2):151–61.
15. Ecker R, Beltrame V, Dallacosta F. Mortalidade Pós-Transplante Renal. *Rev Interdiscip Estud em Saúde*. 2015;9(2):253–60.
16. Mendonça AEO, Torres GDV, Salvetti MDG, Alchieri JC, Costa IKF. Mudanças na qualidade de vida após transplante renal e fatores relacionados. *Acta Paulista de enfermagem*. 2014; 27(3), 287–292.
17. Riella L V. Entendendo as causas da mortalidade pós-transplante - indo além do que se percebe à primeira vista. *J Bras Nefrol*. 2018;40(2):102–4.
18. Rodrigo E, Ruiz JC, Piñera C, Fernández Fresnedo G, Escalada R, Palomar R, Arias M. Creatinine reduction ratio on post transplant day two as criterion in defining delayed graft function. *American Journal of Transplantation*. 2004; 4(7), 1163–1169.
19. Tavares M, Junior H, Pestana J. Readmissão Hospitalar Precoce no transplante renal: artigo de revisão. *J Bras Nefrol*. 2020;42(2):231–7.
20. Gómez-Sánchez M, Gómez-Ziga A, Carcencia-Barajas C, Ortiz-Luis S. Complicaciones de pacientes con trasplante renal en las primeras 48 horas en un hospital de tercer nivel de atención. *Rev enferm Inst Mex Seguro Soc*. 2019;27(3):154–62.
21. Helfer MS, Pompeo J de C, Costa ORS, Vicari AR, Ribeiro AR, Manfro RC. Efeitos de longo prazo da duração da função tardia do enxerto sobre a função e sobrevida de transplantados renais com doadores falecidos. *J Bras Nefrol*. 2019;41(2):231–41.
22. Sandes-Freitas TV de. A problemática da função tardia do enxerto renal no Brasil. *J Bras Nefrol*. 2019;41(2):166–7.
23. Corrêa APA, Brahm MMT, Teixeira CDC, Ferreira SAL, Manfro RC, Lucena ADF, et al. Complicações durante a internação de receptores de transplante renal. *Revista Gaúcha de Enfermagem*. 2013; 34(3), 46–54.