Original Article

Urinary catheter: Myths and rituals present in preparation of patients*

Cateter urinário: Mitos e rituais presentes no preparo do paciente

Catéter urinario: Mitos y rituales presentes en la preparación del paciente

Alessandra Mazzo[1], Aidê Amábile Coelho dos Santos Gaspar [2], Isabel Amélia Costa Mendes[3], Maria Auxiliadora Trevizan[4], Simone de Godoy[5], José Carlos Amado Martins[6]

ABSTRACT

Objective: This study aimed to identify and describe myths and rituals in preparing patients for urinary catheter insertion. **Methods:** This was an observational, exploratory and descriptive study conducted in nine hospitals of a city in the interior of Brazil. Following ethical precepts, data were collected by interview, with the nurse designated by the institution, using a semistructured instrument. Among the 13 institutions of the municipality, nine participated in the study. **Results:** All hospitals had a standardized, implemented procedure for urinary catheterization. During the preparation of patients, five participants (55.5%) made no reference to orientation, privacy and humanization. All adopted divergent procedures for hygiene and antisepsis of the urethral meatus, with the presence of myths and rituals that exist outside the scientific evidence and highlight the functionalist model of the procedures performed by nursing staff. **Conclusion:** There is a need to reassess the intervention of urinary catheterization, with interdisciplinary discussions, emphasizing the use of scientific principles.

Keywords: Urinary catheterization; Nursing; Cerimonial behavior; Antisepsis

RESUMO

Objetivo: Este estudo buscou identificar e descrever mitos e rituais no preparo do paciente para a inserção do cateter urinário**. Métodos:** Trata-se de um estudo observacional, exploratório e descritivo, realizado em nove hospitais de um município do interior paulista. Seguidos os preceitos éticos, os dados foram coletados por entrevista, junto ao enfermeiro designado pela instituição, utilizando-se um instrumento semiestruturado. Dentre as 13 instituições do município, nove participaram do estudo. **Resultados:** Todos os hospitais possuíam o procedimento de cateterismo urinário padronizado e implantado. Durante o preparo do paciente, 5 (55,5%) não fizeram referência à orientação, privacidade e humanização. Todas adotam procedimentos divergentes para higiene e antissepsia do meato uretral, com presença de mitos e rituais que se sobressaem às evidências científicas e destacam o modelo funcionalista nos procedimentos realizados pela equipe de enfermagem. **Conclusão:** Há necessidade de reavaliar a intervenção de cateterismo urinário, com discussões interdisciplinares, dando ênfase à utilização de princípios científicos.

Descritores: Cateterismo urinário; enfermagem; Comportamento ritualístico; Antissepsia

RESUMEN

Objetivo: En este estudio se buscó identificar y describir los mitos y rituales en la preparación del paciente para la inserción del catéter urinario**. Métodos:** Se trata de un estudio observacional, exploratorio y descriptivo, realizado en nueve hospitales de un municipio del interior paulista. Siguiéndose los preceptos éticos, los datos fueron recolectados por entrevista, junto al enfermero designado por la institución, utilizándose un instrumento semiestructurado. De las 13 instituciones del municipio, nueve participaron en el estudio. **Resultados:** Todos los hospitales poseían el procedimiento de cateterismo urinario patronizado e implantado. Durante la preparación del paciente, 5 (55,5%) no hicieron referencia a la orientación, privacidad y humanización. Todas adoptan procedimientos divergentes para la higiene y antisepsia del meato uretral, con presencia de mitos y rituales que se exceden a las evidencias científicas y destacam el modelo funcionalista en los procedimientos realizados por el equipo de enfermería. **Conclusión:** Hay necesidad de reevaluar la intervención del cateterismo urinario, con discusiones interdisciplinarias, dando énfasis a la utilización de principios científicos.

Descriptores: Cateterismo urinário; Enfermería; Conducta ceremonial; Antisepsia

**This study was conducted in the city of Ribeirão Preto (SP), Brazil.*

[1] Associate Professor, University of São Paulo at Ribeirão Preto, College of Nursing, General and Specialized Nursing Department – Ribeirão Preto (SP), Brazil.

[2] Associate Professor, Universidade Paulista (UNIP), Nursing Program. Ribeirão Preto (SP), Brazil.

[3] Full Professor, University of São Paulo at Ribeirão Preto, College of Nursing, General and Specialized Nursing Department – Ribeirão Preto (SP), Brazil.

[4] Full Professor, University of São Paulo at Ribeirão Preto, College of Nursing, Graduate Program in Fundamental Nursing – Ribeirão Preto (SP), Brazil.

[5] Professor Doctor Laboratory Specialist, University of São Paulo at Ribeirão Preto, College of Nursing, General and Specialized Nursing Department – Ribeirão Preto (SP), Brazil.

[6] Associate Professor, Escola Superior de Enfermagem de Coimbra (ESENFC), Scientific-Pedagogical Unit of Medical-Surgical Nursing. Coimbra, Portugal.

Corresponding Author: **Alessandra Mazzo**
Av. Bandeirantes, 3900 – Campus Universitário
CEP 14040-902 – Ribeirão Preto – São Paulo
E-mail: amazzo@eerp.usp.br

Received article **04/08/2011** and accepted **17/04/2012**

INTRODUCTION

Urinary catheterization is a procedure widely used in nursing clinical practice and consists of inserting a probe or catheter into the bladder through the urethra. Invaluable for the diagnosis and treatment of pathological processes, it is also efficient in relieving urinary retention and incontinence while preserving renal function. It requires scientific knowledge and technical ability and should be used with discretion when strictly necessary[1-2].

Urinary tract infection (UTI) is undoubtedly the main iatrogenic factor caused by urinary catheterization[3]. UTI is the most common bacterial infection[4] and one of the most prevalent hospital-acquired infections, with economic repercussions, sequelae, complications and immeasurable harm to the population. It represents about 40% of all hospital-acquired infections and 70% to 88% of them are caused by the use of catheters[5-7].

In intermittent catheterization, the catheters are removed shortly after emptying the bladder, which is associated with lower UTI rates, while indwelling catheters are connected to a urine collector, which increases the risk of infection[2,8].

The time the catheter remains in the urinary tract is the main risk factor for UTIs[9]. The catheterization method, quality of care provided while inserting and maintaining the catheter, in addition to the patient's susceptibility, are also associated with the occurrence of UTIs. Some of the factors implicated are pyelonephritis, preterm birth, fetal mortality in pregnant women, renal dysfunction and sepsis, which increases the number of medical visits, length of hospitalization, quantity of prescribed antimicrobial agents, and associated co-morbidities[4,10-11].

Microorganisms active in the infection process can colonize the urinary tract in an endoluminal way, that is, during catheter insertion, ascending through the lumen or the drain pipe or the collector bag pipe or, in an extraluminal way, through the space existing between the catheter and the urethra or by cross contamination that may occur when the nursing staff empties the collector bag without proper aseptic care[12-14].

In addition to UTIs, the urinary catheterization technique can lead to other complications such as urethral trauma, pain and false passage. Trauma in the urethral tissue during the insertion of a catheter also increases the risk of infection[2].

Many nursing professionals ignore the indications, complications, and practices that can prevent urinary catheter-related adverse events. Even though there is consensus regarding the need to use sterile material and rigorously aseptic technique in its insertion, divergences are found in the literature in relation to the stages of the procedure. Such a factor is even more aggravating if coupled with different social, economic, and political contexts and the relationships of power and access to health knowledge that affect practices implemented in institutions[2, 11-12,14].

A lack of standardization of nursing procedures and mythical and ritualistic practices are common in health care services. Myths are beliefs based on tradition and convenience, which emerge as historical narratives that slowly become part of a culture or institution. Rituals are actions performed according to custom. Myths and rituals originate from illegitimate practices established long ago and that, due to institutions' bureaucratic and hierarchical characteristics, are perpetuated in the context of nursing work[13].

Urinary catheterization is frequently performed in clinical practice in a ritualistic manner. The diverse stages that comprise this procedure follow a formal and prescribed standard. Therefore, there is an imperative to clarify and demystify issues concerning its implementation through scientific evidence.

Myths and rituals related to urinary catheterization still exist in clinical practice and directly interfere in the quality of care provided to patients and for this reason deserve investigation. Based on this motivation, this study's objective was to identify and describe the myths and rituals concerned the preparation of patients for urinary catheterization in hospitals of a city in the interior of São Paulo, Brazil.

METHOD

This descriptive study was conducted to describe and register the aspects related to the preparation of patients for the insertion of a urinary catheter.

After authorization was provided by the Ethics Research Committee at the University of São Paulo at Ribeirão Preto, College of Nursing (Report No. 0961/2008) and the participants signed free and informed consent forms, data collection was initiated through interviews conducted in all the hospital facilities existing in a city in the interior of São Paulo, Brazil. Nine out of the 13 hospitals in the city consented to participate in the study. One nurse, assigned by each of the participating facilities, was interviewed.

A semi-structured form was used that addressed the demographic information and identification of the facility and interviewed professional and also whether the facility adopted a standardized urinary catheterization procedures. When an affirmative answer was obtained concerning the use of a standardized protocol for the procedure, interviewees were asked who had been responsible for developing such material and how long it took, as well as for how long it has been

in effect, its description, and interference factors from the participants' point of view. The studied hospitals were described in alphabetic order and classified as small, medium or large and as public, private or mixed according to their financing schemes.

The results were analyzed according to the literature available on the subject and descriptive statistics and are presented in a discursive report and tables.

RESULTS

Five out of the nine studied hospitals were private, three were public and one was a philanthropic hospital. Two hospitals were small, four were medium and three were large facilities.

The urinary catheterization procedure was standardized and implemented in all the facilities over a period of six to 50 months; the average time of standardization was 26.4 months and the average time since implementation was 22.4 months.

As reported by the interviewees, the urinary catheterization procedure is performed by nurses, by the nursing and medical staff after medical prescription in all the studied facilities and its use is also suspended only after medical prescription.

Five of the interviewees did not provide a description of the procedure for how patients were approached; three reported a concern with patient privacy and two reported that patients received information regarding urinary catheterization before their procedure. There was more than one answer by one individual.

In regard to perineal care prior to the procedure, seven reported performing perineal care, one reported it is performed only if necessary, and one does not perform perineal care. All the facilities use different methods, but all do use soap and water, as shown in Table 1.

The products used by the interviewed professionals to perform antisepsis prior to catheterization included: topical polyvinylpyrrolidone (PVPI) was used in five hospitals; topical chlorhexidine was used in three hospitals; and either topical PVPI or topical chlorhexidine was used in one hospital. If patients were allergic to iodine, two hospitals used topical chlorhexidine and one hospital used degerming chlorhexidine instead.

Antisepsis is implemented differently in each facility and we highlight different rituals concerning quantity and the direction of movements in antisepsis for male and female patients. Table 2 presents the answers concerning the material used and the antisepsis technique performed by the health workers of the studied facilities.

Table 1 – Description of perineal care and material used, Ribeirão Preto, SP, Brazil – 2010

Hospitals	Material used	Perineal care
A	Warm water, basin, bedpan, liquid soap or new bar soap, glove, and towel	Perineal care during shower
B	Water and soap	Perineal care during bed bath
C	Does not perform perineal care	No perineal care
D	Water and soap	Spray shower
E	Water and soap with proper rinsing	Performed if needed
F	Water and liquid soap	Perineal care during shower
G	Water, soap and gloves	Perineal care during shower
H	Water and liquid soap. Does not use the patient's soap.	Perineal care during shower
I	Water, soap and gloves	Perineal care during shower

Table 2 – Description of penis antisepsis and perineum before urinary catheterization in male and female patients, Ribeirão Preto, SP, Brazil – 2010

Hospitals	Male asepsis	Female asepsis
A	Dominant hand on the patient's penis, exposing glans, using two cotton balls in clockwise circular motion, from the meatus to the glans, perform it twice	Half open hand between the labia majora, pull up the perineum, expose the urinary meatus, use four gauzes using circular motion twice after the vestibule and labia minora.
B	Hold penis with a gauze, antisepsis is performed in the meatus with clockwise circular motion, three times	Open labia majora, three times in the meatus with circular motion, in the labia minora in anteroposterior direction.
C	In osteo external urethra, foreskin and glans with a circular motion	In the osteo urethra in a single circular movement in the labia majora and labia minora in the anteroposterior direction.
D	With circular motion in the urinary meatus, three times	In the meatus in circular motion, three times
E	Does not apply	Expose the urethral meatus, moving labia minora, moisten gauze with antiseptic in a circular motion from the meatus to the labia majora, four times.
F	Hold the penis with one hand, pull back the foreskin, use circular motion in the meatus and glans	Expose the urethral meatus moving away the labia majora with left hand, in the meatus, labia minora and labia majora.
G	From the glans to the root of penis, around the organ, at the end perform gyratory movements in the glans	In the labia majora and then in the labia minora in anteroposterior direction.
H	Hold the penis with dominant gloved hand, in the meatus and glans using circular motion.	Open labia minora, in the meatus with a circular motion, in the vaginal vestibule and in the labia minora in the anteroposterior direction.
I	Does not apply	In the meatus with circular motion, in the labia minora and labia majora in the anteroposterior direction.

DISCUSSION

Inserting a urinary catheter is an aseptic procedure that requires the use of sterile material and should be performed by qualified, ethical and thoughtful health workers[10,15].

Because it is an invasive procedure, it can cause physical and psychological embarrassment to the patient, and is the responsibility of professionals to inform patients of why it is needed, obtain the consent of patients to perform it, and avoid any kind of embarrassment [16], enabling a less traumatic and more humanized procedure[17]. Nonetheless, more than half of the participants did not report any guidance, or mention any concerns with privacy or other forms of humanization, showing that the practice of this procedure is focused on the performance of activities and associated with a technical profile of nursing professionals.

The high prevalence and large-scale use of urinary catheterization make the urinary tract infection (UTI) one of the more severe problems observed in hospitals and health services[10]. Among the various stages that comprise this procedure, issues related to perineal care and antisepsis have been highlighted in the prevention of UTI. Seven out of the nine interviewed individuals reported that perineal care was performed with water and soap in the facilities where they worked, which corroborates the recommendation of some authors[7,14], however, issues concerning the frequency, method and antiseptics used should be highlighted.

Perineal care prior to inserting the urinary catheter aims to prevent the entry of microorganisms into the urethra, which can adhere in it and create a ring around the urinary catheter, causing friction and irritation in the meatus. This procedure should be performed with soap and water ensuring that all areas are clean; soap must be completely rinsed and the perineum dried at the end of the procedure. It is essential to implement all the stages of this procedure to avoid any type of trauma in the tissue, which compromises the skin's natural barrier and makes the area more prone to contamination by pathogenic microorganisms during the catheter's insertion and maintenance[12].

The perineum and urethral meatus should be cleaned daily with soap and water and it be ensured that the urinary catheter is immobilized, in order to insure all areas are clean and to prevent tissue trauma[12]. It is, however, necessary to note that daily antisepsis practice is not recommended since such a routine may lead to trauma and consequent invasion of the tissue by pathogenic microorganisms[3,18] as shown by a randomized study conducted in Turkey with patients in intensive care. The study reported no differences in UTI rates caused by urinary catheterization when comparing: daily hygiene of the urinary meatus once a day with iodinated solution at 9%; once or twice a day with chlorhexidine; or without the use of antiseptic solutions[18]. According to this study's participants, iodophor solutions and chlorhexidine stand out among the solutions used for the antisepsis of urinary catheter.

Iodophor solutions are stable combinations of iodine or triiodide that have a carrier vehicle of high molecular weight[19]. Polyvinylpyrrolidone (PVPI) is the most commonly used iodophor solution and may be found in degerming and alcoholic and aqueous forms, while the latter is indicated to be used for urinary catheters. It has high antiseptic action, low toxicity and the PVPI at 10% may provide 1% of free iodine that is released when in contact with skin for at least two minutes[19-20].

Chlorhexidine solutions are relatively unaffected by the presence of organic matter, have low toxicity and contact photosensitivity. They have high antimicrobial interaction on skin and mucosae with a residual effect of five to six hours, and a high level of bactericidal and virucidal activity, with the exception of hydrophilic viruses. They require contact with tissue for at least 15 seconds and for several days to present a residual effect[21]. They do not act against the tuberculosis bacillus, are not sporicidal and are inactive in the presence of acid-resistant bacteria. Chlorhexidine solutions may be found in aqueous media, with alcohol and with detergents. The aqueous preparations are indicated for antisepsis of the urinary catheter and must be stored in appropriate sterile containers, protected from light and high temperatures and not for more than one year[19, 20].

Even though the use of antiseptics for the insertion of urinary catheters is a polemic subject, in which institutional myths, which are part of the practice of professionals, stand out as indicated in the studied sample, there is scientific evidence in the literature showing the extent to which antiseptics are efficient.

A randomized study conducted in 2001 verified UTI rates comparing the use of chlorhexidine at 0.1% and running water before inserting the urinary catheter in young primiparous women during labor. It reported no differences in the rates of infections between the two groups, although the authors stress that the variable C-section and/or normal delivery may have influenced the results[21].

Another prospective, randomized study conducted with children does not report differences in UTI rates when comparing the use of topical PVPI at 10% and sterile water in the preparation of urinary catheters[22]. Recently, Hong Kong researchers also reported no differences when evaluating the risk of symptomatic infection of the urinary tract through the practice of antisepsis with chlorhexidine at 0.05% or sterile water

before inserting the urinary catheter in elderly individuals living in the community[23].

Evidence shows that the most significant factors in the emergence of UTIs are related to the frequency of use, prevention of trauma when inserting the catheter and length of time the urinary catheter remains in the urinary tract, in addition to the use of antiseptic techniques for the maintenance of the closed urine drainage system[3].

Rituals in nursing practice are related to gender and relationships of power present in health services between workers and patients. The work of the nursing staff is guided by the functional work model based on tasks and routines incorporated into routine practices[23].

Circular, repeated and clockwise movements were rituals found in the antisepsis of male and female patients during the procedure of urinary catheterization performed in the studied hospitals. We note that anteroposterior antisepsis for female patients, which is a recommended[16] procedure, was not mentioned by the nurses of three hospitals. Rituals supersede evidence-based practices confirming the presence of tradition and the functionalist model in the procedures performed by the nursing staff.

Rituals and myths influence daily routines and healthcare, changing many aspects of life. They encompass the unit of nurses as a social group, combining practice and the symbolic, and should be used as an instrument to develop the profession but not as an act of negligence[23]. Evidence of understanding of health under the Cartesian, mechanistic, technicalized and fragmented approach, as presented in the procedure for urinary catheterization, show a professional tendency to technicality and also a lack of interest for the qualification of nurses[24, 25].

Nurses and the profession *per se* need to develop an emancipatory practice, assuming that myths and rituals are real possibilities in the delivery of care but should, however, be improved by knowledge that incorporates scientific evidence into the development of protocols, work standards and routines[24-25].

CONCLUSION

Even though this study sought to identify myths and rituals employed when preparing patients for urinary catheterization, one of its limitations was that the results originated from interviews held with the representatives of the studied facilities and not the direct observation of the procedure *per se*. Nonetheless, the results explicitly show the need to reevaluate the way urinary catheterization is implemented through interdisciplinary discussions emphasizing the use of scientific evidence, employing appropriate technological resources with a view to humanize and ensure the quality of nursing care delivery.

Urinary catheterization stands out as a risk factor for the development of UTIs and the risk posed to both patients and professionals is apparent by the way this procedure has been performed in the studied sample. For myths and rituals to be revised in this context, scientific evidence concerning the preparation of patients for the insertion of a urinary catheter need to be discussed during the educational process of professionals, since such evidence shows the need to incorporate concepts concerning interaction, guidance and respect for patients into the procedure, in addition to basic hygiene measures undertaken prior to insertion and during the maintenance of catheters. Additionally, evidence shows that the type of antiseptic solution used or how it is used is not a determining factor in the prevention of UTIs. On the contrary, evidence shows that as antiseptic solutions are used without proper criteria or without proper acquisition and storage standards, they may in fact lead to the emergence of infections. It is the role of nurses in health care facilities to identify rituals involving this practice and seek educational strategies employing the use of scientific principles directed to the staff.

REFERENCES

1. Fumincelli L, Mazzo A, Silva AA, Pereira BJ, Mendes IA. Scientific literature on urinary elimination in Brazilian nursing journals. Acta Paul Enferm [Internet]. 2010 [citado 2011 Jan 5]; 24(1): [about 4p]. Disponível em: http://www.scielo.br/pdf/ape/v24n1/en_v24n1a19.pdf
2. Lenz LL. [Vesical catheterism: cares, complications and writs of prevention]. ACM Arq Catarin Med. 2006, 35(1):82-91. Portuguese
3. Center for Disease Control and Prevention. Guideline for prevention of catheter-associated urinary tract infections [Internet]. Atlanta: CDC; 2009 [cited 2011 Feb 2]. Available from: < http://www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf
4. Foxman B. Epidemiology of urinary tract infections: incidence, morbidity, and economic costs. Dis Mon. 2003; 49(2):53-70.
5. Gagliardi EM, Fernandes AT, Cavalcante NJ. Infecção do trato urinário. In: Fernandes AT, editor. Infecção hospitalar e suas interfaces na área da saúde. São Paulo (SP): Atheneu; 2000. p.459-78.
6. Saint S, Kowalski CP, Kaufman SR, Hofer TP, Kauffman CA, Olmsted RN, et al. Preventing hospital-acquired urinary tract Infection in the United States: a national study. Clin Infect Dis. 2008; 46(2):243-50.
7. Couto RC, Pedrosa TM. Prevenção da infecção do trato urinário. In: Couto RC, Pedrosa TM, Nogueira JM,

organizadores. Infecção hospitalar e outras complicações não-infecciosas da doença: epidemiologia, controle e tratamento. 3a ed. Rio de Janeiro: Medsi; 2003. p 513-8.
8. Stamm AM, Forte DY, Sakamoto KS, Campos ML, Cipriano ZM. Cateterização vesical e infecção do trato urinário: estudo de 1.092 casos. ACM Arq Catarin Med. 2006; 35(2):72-7.
9. Portugal. Ministério da Saúde. Instituto Nacional de Saúde Dr. Ricardo Jorge. Recomendação para a prevenção da infecção do trato urinário. Avaliação de curta duração. Lisboa: Ministério da Saúde; 2004.
10. Kuga AP, Fernandes VL, editores. Prevenção de infecção do trato urinário – (ITU) relacionado à assistência à saúde. 2a ed. São Paulo: Associação Paulista de Estudos e Controle de Infecção Hospitalar; 2009.
11. Sublett CM. Critique of 'Effect of time of day for urinary catheter removal on voiding behaviors in stroke patients'--the meaning of significance to the evidence base. Urol Nurs. 2007; 27(3):236-8.
12. Leaver RB. The evidence for urethral meatal cleansing. Nurs Stand. 2007; 21(41):39-42.
13. Alves MV, Luppi CH, Paker C. [Behaviors assumed by nurses related to the vesical exploration proceedings]. Rev Ciên Ext. 2006; 3(1):10-25. Portuguese.
14. Souza AC, Tipple AF, Barreto RA. [Urinary catheterism: knowledge and adhesion to the control of infection by the nursing professionals]. Rev Eletr Enferm [Internet]. 2007 [citado 2008 Jul 2]; 9(3). Portuguese. Disponível em: http://www.fen.ufg.br/revista/v9/n3/v9n3a12htm.
15. Panknin HT, Althaus P. Guidelines for preventing infections associated with the insertion and maintenance of short- term indwelling urethral catheters in acute care. J Hosp Infect. 2001;49(2):146-7.
16. Geng V, Emblem EL, Gratzl S, Incesu O, Jensen K. Urethral catheterization [Internet]. The Netherlands: European Association of Urology Nurses; 2006. Section 2, Male, female and pediatric intermitente catheterization. (Good Practices in Health Care) [cited 2012 Jan 12]. Available from: http://www.uroweb.org/fileadmin/user_upload/EAUN/EAUN1.pdf
17. Troncoso MP, Suazo SV. [Humanized care: a challenge for nursing in the hospitals services]. Acta Paul Enferm. 2007; 20(4): 499-503. Spanish
18. Koskeroglu N, Durmaz G, Bahar M, Kural M, Yelken B. The role of meatal disinfection in preventing catheter-related bacteriuria in an intensive care unit: a pilot study in Turkey. J Hosp Infect. 2004; 56(3):236-8.
19. Graziano KU, Silva A, Bianchi ER. Limpeza, desinfecção, esterilização de artigos e anti-sepsia. In: Fernandes AT, Fernandes MO, Ribeiro Filho N, Graziano KU, Cavalcante NJ, Lacerda RA, editores. Infecção hospitalar e suas interfaces na área da saúde. São Paulo (SP): Atheneu; 2000. p.266-305.
20. Silva AA, Mazzo A, Pereira BJ, Girão FB, Fumincelli L, Mendes IA. [The use of antiseptic solutions in clinical nursing practice]. Rev Enferm UERJ [Internet]. 2010 [cited 2011 Jan 10]; 18(3): 473-7. Portuguese. Available from: http://www.facenf.uerj.br/v18n3/v18n3a24.pdf
21. Webster J, Hood RH, Burridge CA, Doidge ML, Phillips KM, George N. Water or antiseptic for periurethral cleaning before urinary catheterization: a randomized controlled trial. Am J Infect Control. 2001;29(6):389-94.
22. Al-Farsi S, Oliva M, Davidson R, Richardson SE, Ratnapalan S. Periuretheral cleaning prior to urinary catheterization in children: sterile water versus 10% povidine-iodine. Clin Pediatr (Phila). 2009; 48(6):656-60.
23. Cheung K, Leung P, Wong YC, To OK, Yeung YF, Chan MW, et al. Water versus antiseptic periurethral cleansing before catheterization among home care patients: randomized controlled trial. Am J Infect Control. 2008; 36(5):375-80.
24. Zago MM, Rossi LA. [Critical analysis of rituals in the medical and surgical nursing setting]. Rev Esc Enferm USP. 2003; 37(1):36-43. Portuguese.
25. Pires MR. [Reconstructing myths of nursing through the emancipatory quality of care]. Rev Esc Enferm USP. 2007; 41(4):717-23. Portuguese.