ABSTRACT
Objective: to identify evidence in the literature on risk of urinary tract injury by vesicles catheter use of delay. Method: integrative review with consultation of the LILACS, PubMed, CINAHIL, and The Cochrane Library seeking articles published in the last 10 years. The issue of research was "What are the available evidence in the literature about the risk of urinary tract injury related to use of vesicle catheter indwelling in adult patients?" data analysis used a validated instrument. Of 535 articles found 14 were selected. Results: identified evidence about the contributing factors to the development of complications: inadequate gauge catheter, inadequate fixation, not careful handling, and friction of the catheter, male anatomy, and physiological changes of pregnancy, among others. Conclusion: these results contribute to better planning of nursing care, educational activities and education in service and for the development of research on standardized languages of diagnoses, interventions and outcomes. Descriptors: Nursing; Urinary Catheterization; Delay catheters; Wounds and injuries.

RESUMO
Objetivo: identificar evidências na literatura sobre risco de lesão no trato urinário pelo uso do cateter vesicle de demora. Método: revisão integradora com consulta às bases de dados LILACS, PubMed, CINAHIL e The Cochrane Library buscando artigos publicados nos últimos 10 anos. A questão de pesquisa foi "Quais são as evidências disponíveis na literatura sobre o risco de lesão do trato urinário relacionado ao uso do cateter vesicle de demora em pacientes adultos?" A análise dos dados utilizou um instrumento validado. Dos 535 artigos encontrados 14 foram selecionados. Resultados: identificaram-se evidências quanto aos fatores contribuintes para o desenvolvimento de complicações: calibre inadequado do cateter, fixação inadequada, manipulação não cuidadosa, atrito do cateter, anatomia masculina, mudanças fisiológicas da gestação, entre outros. Conclusão: estes resultados contribuem para melhor planejamento dos cuidados de enfermagem, das atividades de ensino e de educação em serviço e para o desenvolvimento de pesquisas sobre linguagens padronizadas de diagnósticos, resultados e intervenções. Descritores: Enfermagem; Cateterismo Urinário; Cateteres de Demora; Ferimentos e Lesões.

ABSTRACT
In the context of the extensive use of vesicle catheters in adult patients, it is important to identify evidence on the risk of urinary tract injury related to their use. This study aims to perform an integrative review of the literature with consultation of the LILACS, PubMed, CINAHIL, and The Cochrane Library, focusing on articles published in the last 10 years. The research question was "What are the available evidence in the literature about the risk of urinary tract injury related to use of vesicle catheter indwelling in adult patients?" Data analysis was performed using a validated instrument. Among 535 articles found, 14 were selected. The results identified evidence about the contributing factors to the development of complications: inadequate gauge catheter, inadequate fixation, not careful handling, and friction of the catheter, male anatomy, and physiological changes of pregnancy, among others. The conclusions indicate that these results contribute to better planning of nursing care, educational activities and education in service, and for the development of research on standardized languages of diagnoses, interventions, and outcomes. Descriptors: Nursing; Urinary Catheterization; Delay catheters; Wounds and injuries.
INTRODUCTION

The vesicle catheterization is described as an intervention consisting of the insertion of a catheter into the bladder through the urethra to drain the urine.\(^1\)\(^3\) is show in the intervention most often held in the urinary tract.\(^4\)

However, the insertion of a catheter of delay can result in urinary tract infections commonly\(^2\)\(^5\)\(^6\) and the handling of the urinary tract in General, in significant injury.\(^4\) therefore, must be carried out by means of judicious indication.

This is an intervention in which nursing it operates seamlessly and effectively\(^2\), both on insert, as in the maintenance and removal of the device. Because it is an invasive procedure and potentially complex traumatic, requires, in addition to scientific knowledge, technical skill on the part of professionals.\(^1\)\(^5\)

On the basis of the above, it can be affirmed that patients make use of vesicles catheter indwelling present risk of injury concerning the use of this device, being the responsibility of nursing act in order to provide systematic assistance, on the basis of the principles of the nursing process.

Although there is scientific evidence for safe and effective realization of vesicle catheterization, which is important to a broader and in-depth knowledge about complications related to its use and on the risk factors related to the development of these complications, which may offer subsidies for better healthcare planning, with the development of specific preventive interventions.

OBJECTIVE

- Identifying the scientific evidence about the risk of injury by use of vesicle catheter indwelling in adult patients.

MÉTODO

Integrative review in order to gather and synthesize the knowledge produced on the subject. To this end, the following steps have been established: identification of the theme and the question of research, literature search process, information extraction, encoding and critical evaluation of research.\(^7\)

The guiding question crafted from PICO format\(^8\)\(^9\) was << What are the available evidence in the literature about the risk of urinary tract injury related to use of vesicle catheter indwelling in adult patients? >>.

Inclusion criteria were studies published in its entirety in the last 10 years, in English, Portuguese or Spanish, carried out with adult patients (≥ 18 years) and related only to the use of vesicle catheter indwelling.


The search strategy considered sets of terms related to the study population (P); the evaluated intervention (I) and to the exclusion of Pediatric and neonatal studies (limits). Descriptors were selected from controlled vocabularies of each database, as well as uncontrolled descriptors, which were combined with each other.

The final strategy used for searching in PubMed, CINAHL databases and The Cochrane Library was: catheters, indwellingurinary catheterization and orFoley catheter OR urinary catheter AND urinary tract/injuries orurinary tract damage orurinary tract trauma. In the LILACS, the terms used for searching combined with each other were: urinary catheterization, catheters, injury, trauma, injury, Foley catheter, urinary catheter, urinary tract/injuries, complications, Catheter, urinary bladder and probe. We have included articles made in the last ten years, in English, Portuguese or Spanish that they answered the question of research.

535 articles were initially identified. After exclusion of duplicate studies, reading the summaries and observed the inclusion criteria were selected 13 articles. Were deleted articles that didn't answer the question of research. In addition, an article was lifted that responded to the issue of research in the database CINAHL, through references from tracing selected articles, totaling just 14 articles. Of these, 10 selected in PubMed, LILACS, one in two in the CINAHL and one in The Cochrane Library. All articles selected were found in full. Each article was read in full and subsequently completed a validated instrument to the data extraction.\(^10\)
RESULTS

Of the five studies 14 (35.7%) were published between 2003 and 2005; 6 (42.9%) between 2006 and 2008; and three (21.4%) in the years 2009 to 2011.

In relation to publishing journals 78.6% were medical journals, with 35.7% of the total area of Urology.

Most of the studies were performed in the United States (28.6%), followed by studies in countries of the United Kingdom (21.4%), Brazil (14.3%), Japan (14.3%), France (7.1%), the Netherlands (7.1%) and India (7.1%).

As regards the delineation of the survey, the majority was composed of case reports (28.6%) and descriptive studies (28.6%), followed by update (21.4%) studies and literature reviews (21.4%).

Identified complications caused by the use of bladder catheter indwelling and factors that put the individual in a situation of vulnerability to its occurrence.

DISCUSSION

Sought to understand the meaning of the words injury and trauma in order to verify what would be the best term to address the complications identified in this study.

The word injury is defined as a damage produced in a structure or organ. This damage can be classified as a functional or organic.11 The lesion is characterized by a sequence of events occurring after exposure to a harmful agent or stress.12

The word is defined as a trauma injury severity, intensity and extension variables that can be produced in such a way accidental11-12 by physical agents, chemists, among others.11

To translate injury seemed more appropriate to express the damage caused by bladder catheter indwelling evidenced in this study because it is a broader term that trauma.

The complications identified in the literature by vesicle catheter delay occasioned were traumatic urethral injuries5,13 false path8, urethral erosion13-4, vesicle injuries13-9, among them drilling15, vesicle Fistula formation13-7, urethral stricture14-4, mucosal inflammation16, pressure necrosis18, bladder cancer15,17,19, tickly mucosal catheter action11, allergic reaction to latex17 vesicle calculus,1,5,17-9 and pain.5,20 Still, vesicle catheterization and the continuous drainage can reduce the bladder capacity.18

The lesions are urethral complications arising from the use of vesicle catheter delay cited in different studies,5,13-8,21-3. It can be occasioned by inserting5,13 or traumatic removal of the catheter23, by retention balloon inflation in the urethra13-4,22 by compression exerted by catheter into the urethra18 or by careful not handling the catheter.5 of the studies cited, one was3 and descriptive, in this study, traumatic urethral lesions were identified in the search results. The rest were studies of update5,18,21 and a case report.21

In a descriptive study conducted in the United States, whose objective was to determine the incidence, severity and mechanism of iatrogenic injury caused by urethral catheter on male patients, were reported 14 cases of iatrogenic injuries while attempting to insert the catheter.13 In a case study in the same country, the authors contend that silicone catheters can stay stuck even after the deflation (emptying) of the balloon in a deformation of the same function that prevents the removal of the catheter. In these cases the forced removal may cause urethral injury by trauma.23

The injury caused as a result of inflation (filling) of the balloon catheter into the urethra retention was a complication cited in three studies.13-4,22 of these, only two were descriptive. In a study whose objective was to report the institutional experience of immediate reattachment urethral injury complete endoscopic anterior iatrogenic, out of a total of seven patients, three showed urethral trauma due to the balloon inflation in the bulbar urethra. The authors Showthat the urethral rupture can occur during the previous vesicle catheterization of delay.22

Urethral erosion was a complication cited as likely to occur in a case report conducted in United Kingdom14 and in a review of the literature conducted in Japan.17 takes catheters produce a constant pressure on the urethra22 and this pressure can cause the development of urethral erosion and hypospadias.14,17

In a case study in the United Kingdom whose aim was to draw attention to the inadequate care received by patients with spinal cord injury after discharge from the medullary lesion regional center, these authors reported a case of development of urethral erosion and a severe degree of hypospadias.14

The false path was a complication cited in a study of update. According to the author, this is a complication could occur at the time of insertion of the catheter and can be caused by not careful handling.5

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Vesicle drilling was also another complication cited in two case reports.\textsuperscript{15-14} In a study of type case report conducted in the United States with a patient subjected to a vesicle catheterization of delay after anesthetic induction during a cesarean section was established in the post-partum period vesicle drilling. The authors cite as a possible cause of the vesicle offset drilling caused by the fetus, thus, that the silicone catheter, in direct contact with the Trine, had its tip bent forced against the bladder wall. It is stated that in the period of birth and immediate postpartum the bladder and urethra may be more flaccid, which may favor the occurrence of injury.\textsuperscript{15}

In case report conducted in the United Kingdom was described another case of vesicle drilling with penetration of the balloon catheter through the bladder wall and Fistula formation. By means of magnetic resonance imaging, the images confirmed that the balloon catheter through the bladder wall and invaded the lumen of an intestinal segment.\textsuperscript{16}

The fistula was cited as a complication of bladder catheterization of delay in three studies.\textsuperscript{17-19} The vesicle fistula are complications that may be related to trauma or injury of the bladder with the formation of abscesses.\textsuperscript{20} This complication was cited in the case report conducted in United States, previously cited, in which the patient underwent a vesicle catheterization of delay in the postpartum period. During insertion of Foley catheter made with silicone the anterior vaginal wall was punctured four inches from the urethral meatus. The authors reported that Fistula formation, as well as bladder perforation may occur by the possibility of bending the silicone catheter tip and also the sagging bladder and urethra during periods of childbirth and the immediate post-partum.\textsuperscript{15}

Complications such as urethral stenosis, mucosal inflammation, and pressure necrosis and bladder cancer have been identified in the literature as minor injuries through the use of vesicle catheter indwelling. Urethral stenosis is cited as a late complication can occur in patients who have prolonged use of vesicle catheter indwelling.\textsuperscript{13-14}

In the descriptive study conducted in the United States in which the authors identified 14 instances of urethral injury by the use of the catheter, there was development of urethral stricture in a patient.\textsuperscript{13} Moreover, in a case report conducted in United Kingdom the urethral stricture was also cited as likely to occur.\textsuperscript{14}

Inflammation of the mucosa is described as a response to a harmful agent and can be characterized as a defense mechanism which aims to end the Elimination of initial cause of cellular injury.\textsuperscript{12} This complication was cited in a study conducted in the United Kingdom update.\textsuperscript{18} In male clients that make use of vesicle catheter, authors claim they can still be observed complications such as prostatitis and epididymitis.\textsuperscript{2}

The pressure necrosis was another complication caused by the use of vesicle catheter delay cited in a study conducted in the United Kingdom update,\textsuperscript{18} the cells are biochemical and morphological changes as the progression of the lesion. The necrosis may be the result of tissue hypoxia, which can be caused by a number of factors, including infectious agents and physical agents such as mechanical and tissue compression trauma.\textsuperscript{12}

Bladder cancer was presented as a secondary complication vesicle injury by vesicle catheter use of delay and was quoted in an upgrade and two literature reviews.\textsuperscript{5} Authors associate its development to a prolonged period of catheterization.\textsuperscript{17,19}

The tickly mucosal catheter action,\textsuperscript{21} the allergic reaction to latex\textsuperscript{17} and vesicle calculi formation\textsuperscript{22-23} have also been identified as complications related to the use of vesicle catheter indwelling. The tickly action of the catheter in the mucosa was identified in a study carried out at upgrade Brazil,\textsuperscript{2} allergic reaction to latex was cited in a review study conducted in Japan, in which the authors claim that the use of vesicle catheter indwelling can induce the development of an allergic response in the presence of hypersensitivity to material\textsuperscript{17} and vesicle calculus was a complication cited in two studies conducted in Brazil and update United Kingdom\textsuperscript{5,18} and a literature review study conducted in Japan.\textsuperscript{17}

On vesicle calculi, authors claim that urinary tract infection caused by bacteria favors the alkalization of urine and the precipitation of salts, which contributes to the formation of gallstones.\textsuperscript{5,18} For vesicle calculi, on the other hand, may cause obstruction of the urine flow, producing ulcerations and bleeding, predisposing to infection both by obstructive nature as by the trauma.\textsuperscript{12}

In a descriptive study conducted in the United States, whose objective was to determine the incidence and distribution of problems related to prolonged use of vesicle catheter, people that were prolonged use of these devices were accompanied by six months. The obstruction of the catheter was identified in 74.0% of the subjects.\textsuperscript{20}

Delay catheters are prone to the development of incrustation, understood as a
risk factor for the development of lesions. In a study of update has shown that in approximately 50.0% of people that use vesicle catheter for long periods for development of fouling, which can cause obstructions and urine leaks out of the catheter. The pain was a complication shown in descriptive study already quoted, whose goal was to determine the incidence and distribution of problems related to long use of vesicle catheter. Was a symptom reported by 54.0% of participants? Among the reasons were cited by the authors, bladder spasms, catheter position or changes in its position.

From the identification of complications caused by the use of vesicle catheter indwelling, the contributing factors to the development of lesions could be identified. It is noteworthy that in many cases the complications identified were caused by improper handling of the catheter.

A study of update shows that the care required for vesicle delay should be performed by qualified personnel, since many of the complications are caused by the improper handling of the catheter.

A systematic review conducted in the United Kingdom, whose goal was to determine the advantages and disadvantages of the methods for short-term bladder drainage in adults, the authors claim that the supra pubic catheter is more advantageous than the catheter of delay, in relation to bacteriuria and need to recatheterization.

With regard to the high risk of urinary tract infection related to use of vesicle catheter indwelling, the present study made it possible to identify that, once this type of infection to occur, health professionals must pay attention to the risk of emergence of other associated lesions in patients who remain with the vesicle catheter indwelling.

The results found in this study and the absence of a nursing diagnosis that includes specifically the situation of vulnerability of patients who make use of vesicle catheter delay suggests that it can be presented a new diagnosis that portray this situation.

In a study whose objective was to identify nursing diagnoses in prostatectomies patients with views to offer subsidies for development of care for hospital discharge, the authors identified Risk diagnosis of injury related to the use of vesicle catheter indwelling for all patients who were part of the sample. Although they considered the use of vesicle catheter of delay as a risk factor, there have been reports of difficulties in identifying him between the external and internal factors presented in the NANDA-I to this nursing diagnosis.

CONCLUSION

The proposal of this study enabled a thorough look for complications and risk factors of development of injury to the lower urinary tract.

From the method of integrative review was possible the expansion of knowledge on the topic investigated, as well as the identification of available evidence in the literature on the risks of injury to the bladder catheter-related urinary tract of delay.

The results allowed the identification of complications related to the use of the catheter and from them, it was possible to identify the causative factors or contributors to the development of lesions. The complications identified were: traumatic urethral injuries, false path, urethral erosion, bladder perforation, fistula, urethral stricture, mucosal inflammation, pressure necrosis, and bladder cancer, and mucosal catheter tickly action, allergic reaction to latex, vesicle calculi and pain.

As regards the factors causing or contributing to the development of the lesion has been identified: higher caliber of the catheter, pressure developed by catheter, inadequate fixation, not careful handling, friction of the catheter with the mucosa, male anatomy, retention balloon inflated in the urethra, unwanted pulls, inflated balloon catheter removal, deformation of the retaining balloon, incrustation, obstruction of the catheter, prolonged use of physiological catheter changes caused by pregnancy and the material of construction of the catheter.

In relation to the level of evidence of studies, this review sample was composed of literature reviews, case reports, updates, and descriptive studies. It is considered the need for development of studies whose methods can deliver results with greater strength of evidence. Still, the results obtained make it possible to glimpse the importance of nursing professionals in the prevention of complications caused by the use of vesicle catheter indwelling. Also, offer professionals a scope of possible injuries related to the use of this device and factors that can lead to the development of these lesions.

In this way, it is considered that the present study has impact for clinical practice, teaching and research in nursing, since it can contribute to the planning of care, educational activities and education in service. Can also encourage discussion and provide data for future research on nursing
diagnoses and interventions directed to clients in use of vesicle catheter of delay, with a view to improvement in quality of care and, consequently, prevention of complications which may occur in these clients.

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