



Nurses' knowledge about assistance in urinary tract dysfunction after spinal cord injury

Conhecimento de enfermeiros sobre assistência na disfunção do trato urinário após lesão medular

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Objective: to report the knowledge of nurses about nursing care to people with spinal cord injury and urinary tract dysfunction. **Methods:** a cross-sectional study with 19 nurses from a tertiary hospital. Data were collected using a semi-structured questionnaire, validated concerning content for this research, containing sociodemographic, professional and knowledge variables. The Chi-square, Fisher and Contingency Coefficient tests were performed. **Results:** a higher frequency of correct responses was detected for catheterization of delay associated with a higher risk of infection ($p < 0.001$); complications due to changes in micturition pattern ($p < 0.001$); and discouragement to liquid intake at night ($p < 0.005$). There was a lower percentage of correct answers for the orientation of Credé and Valsalva maneuvers ($p < 0.001$). The training institution of participants was associated with knowledge ($p = 0.032$). **Conclusion:** the participating nurses presented satisfactory knowledge about nursing care to people with spinal cord injury and urinary tract dysfunction.

Descriptors: Spinal Cord Injuries; Urinary Bladder; Neurogenic; Nursing Care; Knowledge.

Objetivo: relatar o conhecimento de enfermeiros acerca da assistência de enfermagem às pessoas com lesão medular e disfunção do trato urinário. **Métodos:** estudo transversal, com 19 enfermeiros de hospital terciário. Coletaram-se dados utilizando-se de questionário semiestruturado, validado em nível de conteúdo para esta investigação, contendo variáveis sociodemográficas, profissionais e de conhecimento. Realizaram-se os testes Qui-quadrado, Fisher e Coeficiente de contingência. **Resultados:** detectou-se maior frequência de respostas corretas para cateterismo de demora associado a maior risco de infecção ($p < 0,001$); complicações devido às mudanças no padrão miccional ($p < 0,001$); e desestímulo à ingestão líquida durante a noite ($p < 0,005$). Verificou-se menor percentual de acertos para orientação das manobras de Credé e Valsalva ($p < 0,001$). A instituição de formação dos participantes associou-se ao conhecimento ($p = 0,032$). **Conclusão:** os enfermeiros participantes apresentaram conhecimento satisfatório sobre cuidado de enfermagem às pessoas com lesão medular e disfunção do trato urinário.

Descritores: Traumatismos da Medula Espinhal; Bexiga Urinária Neurogênica; Cuidados de Enfermagem; Conhecimento.

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Introduction

Spinal cord injury is a health and social problem that requires interdisciplinary attention during the acute phase and the rehabilitation process with a view to (re)inclusion. The statistics point to the occurrence of about 40 new cases of this lesion per million inhabitants, with 6 to 8 thousand cases per year, with a high cost for the health system⁽¹⁾.

Survivors of spinal cord injury coexist with sequelae characterized by impairment of some vital functions, such as neurogenic dysfunction of the lower urinary tract, which may manifest as detrusor hyperactivity, detrusor sphincter dyssynergia, hypocontractile detrusor, sphincter insufficiency or bladder impairment⁽²⁾.

This dysfunction is one of the major concerns for the health team and the person with spinal cord injury, because, when inadequately assisted, complications can arise, such as urinary tract infection, bladder lithiasis, penoscrotal fistulas, vesicoureteral reflux, hydronephrosis, for loss of renal function⁽¹⁾.

These complications impact the quality of life of the affected person by restricting activities and limiting social interactions. However, there are procedures indicated to control neurogenic urinary tract dysfunction such as intermittent aseptic, supra-pubic and urethral catheterization, the latter two of which are known as delay catheterization, which can be associated with significant morbidity due to common problems, such as catheter blocks, infections, and bladder stones⁽³⁻⁴⁾.

The occurrence of one of these complications is related to the limitation of the number of services, human and material resources available for the care of users of urinary catheterization, which poses risks to care and quality of care, thus delaying the rehabilitation process⁽⁵⁾. Adding study indicators, which showed that doctors and nurses do not bother to routinely investigate the symptoms of urinary tract infection and when investigating do not know the proper conduct to

be adopted in the face of the problem⁽⁶⁾.

The main objectives of the treatment of neurogenic dysfunction of the urinary tract are to preserve renal function and adapt the person to the new life condition⁽⁷⁾. When it comes to the nursing performance of the patient with urinary tract dysfunction and needs for intermittent urinary catheterization, it is up to the nurse to provide patients and caregivers with the necessary guidelines for the procedure. It is also important that nurses train these people to manage the material resources for this care, as well as seek improvements for the implementation of the technique, in a safe way and with minimization of traumas and infections resulting from this practice⁽⁸⁾.

In this sense, one of the main challenges for nursing care in rehabilitation is the prevention of complications or secondary disabilities, which must be overcome in order to improve people's functional potential. This acquisition, according to a study report, can be amplified by the teaching of infection prevention and control practices in the training of nurses⁽⁵⁾.

The study is justified because the literature makes little use of the opinion of physicians and nurses about auto-catheterism, and urologists prefer to prescribe permanent catheters, due to the shortage of nurses dedicated to this procedure⁽⁹⁾. Therefore, this study is relevant for originality, and the results can contribute to broaden the discussion about the teaching of infection control practices, in the training of nurses, in addition to being used by researchers, rehabilitation nurses and basic care.

Therefore, it was intended to answer the questions: what is the knowledge of nurses about assistance to people with spinal cord injury and urinary tract dysfunction? What is the association between socio-demographic and occupational characteristics and knowledge about care in urinary tract dysfunction? Thus, the objective was to report the knowledge of nurses about nursing care to people with spinal cord injury and urinary tract dysfunction.

Methods

A cross-sectional study, carried out from April to November of 2018, in a tertiary level hospital in Paraíba, Brazil. It was developed in two stages: I) Elaboration of the instrument based on the theoretical reference of the Health Department Guidelines for the Care of the Person with Spinal Cord Injury⁽¹⁾ and the recommendations of the Brazilian Society of Urology for bladder catheterization⁽¹⁰⁾. To validate the data collection instrument, we used Psychometrics⁽¹¹⁾. II) Data collection with validated and self-applied instrument.

The population for stage I of validation of the instrument was composed of 17 research nurses who met the criteria: to have clinical experience, participation in research involving people with spinal cord injury and to be authors of indexed publications. This population was chosen by non-probabilistic sampling of convenience, selected through the Lattes Platform and invited by e-mail, sending invitation letter with elaborated instrument and Consent Form. From this population, four nurses were sampled, since the others did not return the filled instruments. This sample number was considered because the literature points out controversies to establish the minimum (three) and maximum (twenty) number of judges, considering the characteristics of the instrument, the training, the qualification and the availability of the necessary professionals⁽¹²⁾.

The data collection instrument contained objective questions with the variables: sociodemographic, those related to the professional profile and 15 referring to the knowledge, namely: 1. Types of urinary tract dysfunction after spinal cord injury (detrusor hyperactivity associated with vesico-sphincter dyssynergia or contractility detrusor); 2. Clinical manifestations of autonomic hyperreflexia (high pressure, bradycardia, sweating, erythema, abdominal distension and headache); 3. Complications due to changes in micturition pattern (major types); 4. Urine volume

during intermittent catheterization of 600 ml (mean volume drained); 5. Stimulus to the liquid intake of about 1l/day (mean stimulated volume); 6. Stimulus to the liquid intake during the nocturnal period (before bed); 7. Guidance on the intake of foods rich in calcium (milk, yogurt, cheese); 8. Intermittent catheterization as the best method of choice (urinary dysfunction); 9. Delay catheterization associated with a lower risk of infection (Foley); 10. Factor related to urinary infection in the spinal cord injury (urinary retention or contaminated environment); 11. Relevant aspects to monitor signs of urinary infection (orientation on importance); 12. Replacement of catheterization by the male external catheter (Uripipen); Intermittent bladder catheterization should not be taught (invasive for home use); 14. Orientation of the Credé and Valsalva maneuvers (bladder emptying); 15. Urodynamic examination to guide intermittent catheterization (after hospital discharge). For the questions of knowledge, the participant had the options of answer: right, wrong or unknown.

The judges evaluated this instrument by means of a Likert scale, choosing for each variable of the instrument one of the stipulated points: 1 (Strongly approve), 2 (Approve), 3 (Undecided), 4 (Disapprove) and 5 (Strongly disapprove). When analyzing the level of concordance of the judges, the Validity Index Content >0.80 was adopted⁽¹¹⁾.

In the second stage of data collection, the second population of 24 nurses from the Pediatrics and Neurology sectors of the mentioned hospital was considered, they were selected because they are sites in which patients with spinal cord injury remain during clinical treatment in the acute phase and after receiving emergency treatment, in sectors such as Emergency Room, Intensive Care Unit and Surgical Center. In addition, it is in these places that the nurse acts more actively in the maintenance of urinary function.

At this stage, a sample of 19 nurses was selected, who met the criteria: being on call during the visit

of the researchers and working in the sector for at least one year. The following were excluded: one nurse on vacation, one on leave, one who could not be contacted and one who returned the instrument blank. In addition, another did not accept to participate in the study.

During the data collection, each nurse received the instrument and two copies of the informed consent form in a sealed envelope, identified by the letter N, followed by an ascending numeral (N1, N2, N3 ... N19). The date and time for the return of the instrument were agreed with the professional. One copy of the term remained with the nurse and the other was returned to the researcher along with the instrument.

In the analysis, frequencies, mean and standard deviation were used, as well as the chi-square test to verify adjustment. The Fisher's exact test was applied in situations where the Chi-square assumptions for independence were not satisfied. The Contingency Coefficient was calculated to verify the magnitude of the association, considering the following parameters: strong association ($c \geq 0,750$); moderate association (0.500-0.749); weak association ($c \leq 0,499$)⁽¹³⁾. Data entry was done in spreadsheet, followed by processing and analysis using the *Statistical Package for the Social Sciences*, version 25.0 for Windows. The level of significance was set at $p < 0.05$ for analyses. The knowledge variables were dichotomized as follows: right (correct answers) and wrong (incorrect answers and responses indicating ignorance). In the general analysis of the answers to the test, for each item, the cut-off point of at least 70.0% of correct answers was used as the decision criterion to consider the satisfactory knowledge.

The research complied with Resolution 466/2012 and was approved by the Ethics Committee in Research of the State University of Paraíba, Brazil, according to Certificate of Presentation of Ethical Ap-

preciation no. 34912614,1,0000,5187 and Opinion nº 855,257.

Results

Nineteen nurses participated, of these, ten worked in Pediatrics and nine in Neurology. The average age was 36 years. There was a majority of females ($n=18$), with a partner ($n=10$) and catholic ($n=12$). Regarding professional information, 13 were from public institutions, with an average of 8.6 years of training, with 5.7 standard deviation (SD), 18 specialists, but none in Nursing in Nephrology or Neurology. They worked as nurses, with an average of eight years ($SD=6.17$), 15 had up to five years of service in the hospital, 16 worked with people with spinal cord injury for a maximum of five years, and nine never received any type of training to assist people with spinal cord injury.

Regarding spinal cord injury and urinary tract dysfunction, seven nurses correctly answered at least 11 questions, of which four had a success rate of 11, and three a score of 13 questions. Table 1 contains the information about the satisfactory knowledge for complications in changes in micturition pattern, nocturnal fluid intake and calcium-rich foods, intermittent catheterization and delayed catheterization associated with infection, as well as limited knowledge about manifestations of autonomic hyperreflexia, maneuvers of Credé, Valsalva maneuver and urodynamic examination.

There was an association between nurses' knowledge about care for people with spinal cord injury and the nature of the training institution of the participants, and the magnitude of association was moderate, according to Table 2. The sociodemographic and professional characteristics did not present statistical significance with the level of hits ($p > 0.05$).

Table 1 – Distribution of successful nurses' answers about knowledge concerning spinal cord injury and urinary dysfunction

Variables	Right	Wrong	p*
	n(%)	n(%)	
Types of urinary tract dysfunction after spinal cord injury	6 (32.0)	13(68.0)	0.167
Clinical manifestations of autonomic hyperreflexia	7(37.0)	12(63.0)	0.359
Complications due to changes in micturition pattern	17(89.0)	2(11.0)	<0.001
Volume of urine during 600mL intermittent catheterization	12(63.0)	7(37.0)	0.359
Stimulus to liquid intake of about 1l/day	13(68.0)	6(32.0)	0.167
Discouragement of liquid intake during nighttime	15(79.0)	4(21.0)	<0.005
Advice on eating calcium-rich food	14(74.0)	5(26.0)	0.063
Intermittent catheterization as the best method of choice	14(74.0)	5(26.0)	0.063
Delay catheterization associated with lower risk of infection	18(95.0)	1(5.0)	<0.001
Factor related to urinary infection in spinal cord injury	14(74.0)	5(26.0)	0.063
Relevant aspects for monitoring signs of urinary tract infection	13(68.0)	6(32.0)	0.167
Replacement of catheterization by the male external catheter	12(63.0)	7(37.0)	0.359
Intermittent bladder catheterization should not be taught	13(68.0)	6(32.0)	0.167
Guidance of the maneuvers of Credé and Valsalva	2(11.0)	17(89.0)	<0.001
Urodynamic examination to guide intermittent catheterization	7(37.0)	12(63.0)	0.359

*Chi-square test

Table 2 – Association between professional training institution and knowledge about spinal cord injury

Hits (%)	Institution			p*	c†
	Private n (%)	Public n (%)	Total n (%)		
40	1 (50.0)	1 (50.0)	2 (10.5)		
47	4 (100.0)	-	4 (21.0)		
53	-	2 (100.0)	2 (10.5)		
60	-	2 (100)	2 (10.5)	0.032	0.640
67	-	2 (100.0)	2 (10.5)		
73	1 (25.0)	3 (75.0)	4 (21.0)		
87	-	3 (100.0)	3 (16.0)		
Total	6 (31.6)	13 (68.4)	19 (100.0)		

*Fisher's exact test; † Contingency Coefficient

Discussion

The study presents limitations due to the reduction of the power of generalization of the results, by using a non-probabilistic small sample of professionals from a single health service, and may not reflect the reality of other services. However, the selected hospital is the center with the highest number of visits to people with spinal cord injury in the city selected for investigation. Thus, it is suggested to carry out more extensive research, in other scenarios, with different samples. Further research should also focus on the opinions of nurses and other caregivers involved in the management of urinary tract dysfunction.

With regard to knowledge about urinary tract dysfunction after spinal cord injury, the results of this study are similar to those of a research conducted in Milan, where knowledge gaps were detected, approaching 50.0% of incorrect answers and differences concerning the adherence to best practice principles for prevention and control of infections associated with health care⁽¹⁴⁾.

Knowledge gaps were also detected in a study carried out in Belgium with 244 urologists specialized in spinal cord injury, in which it was found that almost one urologist out of five preferred to use a permanent catheter, claiming a shortage of qualified nurses in this area⁽¹⁰⁾. Also, it is worrisome that nurses present difficulties in relation to some items of the applied instrument. This result indicates that, in addition to continuing education, it is urgent to include this theme in the pedagogical project of undergraduate and postgraduate courses, as a way to strengthen this knowledge and improve professional practice, giving more safety in clinical and managerial decision making.

Regarding the test questions, the majority of nurses mentioned at least one of the main complications due to spinal cord injury and neurogenic urinary tract dysfunction were: urinary tract infection, hydronephrosis, urethral obstruction, urolithiasis, renal amyloidosis, vesicoureteral reflux and renal deterioration⁽¹⁾. A fact that merits approximation is the

disregard of the participants of the complications of the psycho-emotional order, indicating the existence of care more focused on the physical aspects.

On liquid intake during the night period, most nurses responded against such stimulation, according to a scientific report that excessive fluid intake can lead to nocturia, especially if fluid intake occurs at night. This evidence was confirmed in a study in Japan with 67 patients who adjusted their water and food intake so that the production of urine of 24 hours/body weight was equal to or less than 30ml/kg. This sample behavior was shown to be safe, effective and therapeutic, without any adverse event⁽¹⁵⁾.

Regarding the bladder catheter associated with the risk of infection, the majority of nurses correctly answered, in consonance with the literature, that this type of catheter is not recommended due to the high risk of urinary tract infection, bacteriuria, stones, urethral erosion or damage to the urethral sphincter, obstructions, false path or fistula formation, hematuria, injury, urethral pain, bladder cancer and impaired renal function⁽¹⁾. For this reason, the withdrawal of this should be done as soon as possible, assertive, whose findings of the study were encouraging to the knowledge of nurses.

Regarding Credé and Valsalva maneuvers to aid in complete bladder emptying, nurses have stated that these procedures are widely used and should be taught to people with spinal cord injury. However, it is worth mentioning that there is guidance in the literature that discourages these maneuvers, due to the scientific evidence that patients with bladder emptying due to intermittent catheterization evolve better than those performing Credé or Valsalva maneuvers⁽¹¹⁾.

Regarding urinary tract dysfunctions after spinal cord injury, some nurses responded correctly, exemplifying detrusor hyperactivity and detrusor contractility, in agreement with authors who consider both hyperactive and hypoactive bladder risk factors for urologic changes⁽¹⁶⁾. However, most of these professionals presented knowledge gaps on this aspect,

which may hamper the clinical decision on intermittent bladder catheterization, which consists of the gold standard in the care and rehabilitation of the person with spinal cord injury and urinary tract dysfunction.

On the clinical manifestations of autonomic hyperreflexia, the signs and symptoms of this dysfunction were studied in people with spinal cord injury: blood pressure around 20mmHg of usual systolic blood pressure, pulsatile headache, piloerection, redness and sweating above the level of lesion and pallor below it⁽¹⁷⁾.

There was also assertion of nurses for the volume of 600ml of urine drained during intermittent bladder catheterization, as the protocol for standardization of the urinary volume to be drained, and in the spinal cord shock phase, four to six daily catheterizations are recommended, drainage of 600ml of urine and, with resolution of the shock phase, the drained volume should not exceed 400ml⁽¹¹⁾.

Regarding diet, it was stated that the person with spinal cord injury should not be advised to ingest foods rich in calcium, such as milk, yogurt and cheese at will, assertive confirmed by most nurses because excess calcium in people with spinal cord injury and urinary tract dysfunction is not adequate given the possibility of crystalline and/or stone formation. To assist in calculus prevention, most nurses indicated that it is necessary to guide the patient about the ideal liquid intake of two liters per day.

About the fact that intermittent bladder catheterization is the preferred procedure to empty the bladder most nurses confirmed the technique considering the minimization of complications and better therapeutic results. The assertion is supported by specialists who suggest to the nurse to encourage patients to perform bladder rehabilitation and continue using the catheter after being released from the hospital⁽¹⁸⁾.

Regarding the factors for urinary tract infection in people with spinal cord injury, such as urinary retention and incomplete emptying of the bladder, as well as the importance of monitoring the signs and

symptoms of this complication, participants demonstrated satisfactory knowledge and it is important to follow signs of fever, dysuria, urine staining, odor, pyuria and increased urinary losses, as reported in a study by researchers in India on urinary tract infection associated with catheter morbidity, which showed discomfort, fever, indisposition and unnecessary use of antibiotics, contributing to increase the resistance of these microorganisms⁽¹⁹⁾.

Regarding the use of the male external catheter instead of the catheterization, the majority of nurses indicated this procedure as correct. However, there is no scientific evidence to justify such an exchange of procedure. Also, the orientation of the patient or family members on how to perform intermittent bladder catheterization when in the home environment was correct, and it was the practical recommendation of specialists in the area. Also, on the need for urodynamic examination to guide the use of intermittent bladder catheterization, not all nurses responded correctly. It is emphasized that this test is recommended by the literature, but not mandatory, in the analysis of bladder dysfunctions⁽¹¹⁾.

As for the association identified in the institution where the professional concluded the graduation with the index of correctness, it was verified that the nurses of public institution demonstrated greater knowledge about the nursing care to the people with spinal cord injury and dysfunction of the urinary tract. The finding relates to an exacerbated expansion of undergraduate courses, a fact that allows access to higher education to the greater part of the population and without the necessary infrastructure to the proper functioning. A study carried out in the state of Rio de Janeiro, Brazil, on the portrait of undergraduate nursing courses corroborates such evidence, when it is pointed out that the proliferation of private undergraduate courses has aggravated the massification of the training process and, as a result, important in the quality of education⁽²⁰⁾.

Therefore, considering that there are still gaps in the knowledge of professionals to care for patients with spinal cord injury and urinary tract dysfunction,

it is believed that lifelong education requires deep national discussion involving government officials, managers and health professionals, education and the plural society, aiming the decision making on the strategies to be adopted to prevent infections.

Conclusion

The study made it possible to report that the professionals knew the complications due to the changes in the micturition pattern, the catheterism of delay associated with greater risks of infection and the importance of water intake decreased at night, being the highest rates of correctness of the graduates of public institutions. Therefore, the participating nurses presented knowledge on the subject, despite the finding of incorrect answers about some items related to Credé and Valsalva maneuvers.

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Collaborations

França ISX and Sousa ETG contributed with project design, data analysis, writing and critical review of intellectual content and final approval of the version to be published. Coura AS, Pagliuca LMF, Sousa FS and Santos SR collaborated with article writing and relevant critical review of the intellectual content.

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