Journal of Clinical and Nursing Research, 2022, Volume 6, Issue 2
http://ojs.bbwpublisher.com/index.php/JCNR
ISSN Online: 2208-3693
ISSN Print: 2208-3685

Effect of Cluster Nursing in Preventing Urinary Tract Infection in Postoperative Patients with Indwelling Urinary Catheter

Longhui Zhang, Yuanxia Wang, Jianying Huang*

Yancheng No. 1 People's Hospital, Yancheng 224000, Jiangsu Province, China

***Corresponding author:** Jianying Huang, zlh468@163.com

Abstract: *Objective:* This paper expounds and analyzes the effect of cluster nursing in preventing urinary tract infection in postoperative patients with indwelling urinary catheter. *Methods:* A total of 400 postoperative patients with indwelling urinary catheter, treated in Yancheng No. 1 People's Hospital in recent two years, were recruited as research subjects. The patients were equally divided into group A and group B, with 200 patients in each group, and all received routine anti-infectives. The patients in group A (200 cases) received routine nursing. On the basis of group A, cluster nursing was implemented for patients in group B (200 cases). *Results:* The indwelling time of urinary catheter, the disappearance time of bladder irritation symptoms, and the probability of urinary tract infection were compared between both groups, which showed that the nursing effect of group B was better than that of group A ($P < 0.05$). *Conclusion:* The implementation of cluster nursing in postoperative patients with indwelling urinary catheter can improve the deficiency of routine nursing, consolidate the treatment effect, and reduce the complication rate of urinary tract infection.

Keywords: Urinary tract infection; Indwelling urinary catheter; Cluster nursing; Routine nursing

Online publication: March 23, 2022

1. Introduction

Indwelling urinary catheter is a common practice after surgery. However, this practice tends to affect the bladder function of patients to varying degrees and increase the incidence of urinary tract infection [1]. In accordance with relevant data, cluster nursing, as a humanized nursing model, mainly integrates a series of evidence-based nursing methods to assist in treating a complex disease. Its application in the nursing for postoperative patients with indwelling urinary catheter can improve the nursing effect, consolidate the clinical treatment effect, and reduce the probability of urinary tract infection.

2. Data and methods

2.1. General information

From November 2018 to September 2019, an 11-month study was carried out on postoperative patients with indwelling urinary catheter. A total of 400 postoperative patients with indwelling urinary catheter, treated in Yancheng No. 1 People's Hospital during the study period, were recruited as research subjects. The patients were divided into two groups (group A and group B) by the digital table method. There were 200 patients in group A, including 105 male patients and 95 female patients, aged 51-89 years old, with an average age of 72.51 ± 2.61 years old. There were also 200 patients in group B, including 110 male patients

and 90 female patients, aged 53-87 years old, with an average age of 71.21 ± 3.24 years old. There was no statistically significant difference between the two groups ($P > 0.05$).

Inclusion criteria: (1) patients who received surgical treatment and indwelling urinary catheter after surgery in Yancheng No. 1 People's Hospital; (2) patients with clear consciousness and can communicate normally; (3) patients and their families who understood the content of this study in detail and signed the study consent form.

Exclusion criteria: (1) patients with mental illness and cognitive impairment; (2) patients with blurred consciousness and the inability to communicate; (3) patients with major organ dysfunction; (4) patients who are unwilling to cooperate with the researcher.

This study was reviewed and approved by the hospital ethics committee prior to execution.

2.2. Methods

The patients in both the groups were treated with routine anti-infectives. On this basis, the patients in group A received routine nursing care and health education. Medications were administered in consideration of each patient's situation. Indwelling catheters were avoided to reduce the breeding of bacteria and the risk of infection. A clean and tidy ward environment was ensured and the temperature as well as the humidity of the ward were adjusted to the best state. The patients were instructed to maintain correct posture [2].

The patients in group B received cluster nursing on the basis of routine nursing based on the following steps: (1) relevant data on cluster nursing should be first consulted, and a reasonable nursing plan in consideration of each patient's situation and nursing experience should then be formulated; (2) if micturition is ineffective, the nurses should insert an indwelling catheter for the patient and then comprehensively evaluate the physical condition of the patient; silicone catheters of reasonable types and models should be selected, and aseptic procedure after disinfection should be adhered to, so as to prevent infection or mucosal damage [3]; (3) closed anti countercurrent drainage bag should be used and replaced regularly, and the interface should be carried out according to nursing procedures and fully disinfected to avoid infection; the catheter bag should be placed below the bladder level to avoid countercurrent; (4) after each defecation, the patient should gently wipe the urethral orifice with warm water to reduce the probability of infection [4]; (5) shift handover should be strictly implemented, and the patient's urinary catheter should be checked on time every day and adjusted in case of bending and falling out; (6) in regard to humanized nursing, patients with indwelling catheter may feel anxious, fearful, or even other negative psychological emotions; therefore, the nursing staffs should strengthen their communication with patients, constantly pacify the patients' emotions, and ensure that the patients actively cooperate with the nursing intervention; the urethral orifice and anal orifice in female patients are close to each other, so there is a higher risk for infection; therefore, the nursing staffs should clean the anus regularly and pay attention to hand hygiene to control infection [5]; (7) the indwelling time of urinary catheter should be timely evaluated by the nurses regularly, and the catheter should be removed as early as possible as the longer the indwelling time, the greater the risk of urinary tract infection; according to data, the incidence of urinary tract infection increases by 3-7% every day with indwelling urinary catheter; therefore, from the second day after the insertion of the catheter, the nursing staffs need to timely evaluate and remove the catheter as soon as possible.

2.3. Observation indicators

The indwelling time of urinary catheter and the disappearance time of bladder irritation symptoms were observed. The incidence of urinary tract infection was determined correspondingly to the indwelling time. A self-made nursing satisfaction questionnaire by Yancheng No. 1 People's Hospital was distributed to the patients to fill in, and the medical staffs collected the questionnaire. The nursing satisfaction was graded

based on statistical scores, in which 0-60 points correspond to dissatisfied, 60-80 points correspond to generally satisfied, and 80-100 points correspond to very satisfied; total satisfaction = (generally satisfied + very satisfied) / total number of cases × 100% [6].

The quality-of-life scale (SF-36) [7] was used to evaluate the patients' postoperative quality of life, mainly from the aspects of physical function, mental health, mental state, and social function. The score of each item was on a 0-100 range. The higher the score is, the higher the quality of life.

2.4. Statistical analysis

The clinical nursing data of group A and group B were based on SPSS 20.0. The results were expressed in $\bar{x} \pm s$ and percentage (%). $P < 0.05$ indicated a significant difference in the nursing results between group A and group B.

3. Results

3.1. Analysis of the clinical symptoms in group A and group B

After different nursing interventions, the time of indwelling catheter and the disappearance time of bladder irritation symptoms in group A and group B were compared. As shown in **Table 1**, the time of indwelling catheter and disappearance time of bladder irritation symptoms of group B were significantly shorter than those of group A ($P < 0.05$), indicating that the effect of cluster nursing is better.

Table 1. Analysis of the clinical symptoms in group A and group B

Group	Time of indwelling catheter	Disappearance time of bladder irritation symptoms
Group A (n = 200)	16.35 ± 2.26	5.55 ± 1.45
Group B (n = 200)	10.35 ± 1.68	3.27 ± 1.08
t	30.1321	17.8340
P value	0.0000	0.0000

3.2. Probability of postoperative urinary tract infection in group A and group B

As shown in **Table 2**, the incidence of urinary tract infection in each time period was observed. There was no significant difference between group A and group B within one day after the insertion of urinary catheter, $P > 0.05$. However, the incidence of urinary tract infection in group B was lower than that in group A ($P < 0.05$) when the indwelling time was 1-3 days, 4-7 days, and > 8 days.

Table 2. Incidence of urinary tract infection in group A and group B at each time period

Group	< 1 day	1-3 days	4-7 days	> 8 days
Group A (n = 200)	1 (0.50)	9 (4.50)	14 (7.00)	17 (8.50)
Group B (n = 200)	0 (0.00)	2 (1.00)	5 (2.50)	7 (3.50)
X^2	1.0025	4.5805	4.4758	4.4326
P value	0.3167	0.0323	0.0343	0.0352

3.3. Nursing satisfaction

According to the statistics from the nursing satisfaction questionnaire in **Table 3**, the nursing satisfaction of patients in group A was 92.50%, and that of patients in group B was 97.00%. It can be seen from the comparison that the satisfaction of patients in group B was higher than that of patients in group A, $P < 0.05$.

Table 3. Comparison of nursing satisfaction between group A and group B

Group	Very satisfied	Generally satisfied	Dissatisfied	Total satisfaction rate
Group A (n = 200)	85	100	15	185 (92.50)
Group B (n = 200)	91	103	6	194 (97.00)
X^2				4.0709
P value				0.0436

3.4. Quality of life

From the evaluation of the quality-of-life scale in **Table 4**, the physical function, mental health, mental state, and social function scores of group B were higher than those of group A ($P < 0.05$).

Table 4. Comparison of patients' postoperative quality of life between group A and group B

Group	Physical function	Mental health	Mental state	Social function
Group A (n = 200)	76.37 ± 3.58	76.43 ± 3.64	77.25 ± 3.73	75.39 ± 4.05
Group B (n = 200)	81.45 ± 4.12	82.07 ± 3.88	82.14 ± 3.69	82.58 ± 3.66
t	13.1625	14.9924	13.1804	18.6273
P value	0.0000	0.0000	0.0000	0.0000

4. Discussion

Clinically, patients are not able to urinate normally after surgery, and they tend to require indwelling urinary catheters. Improper nursing may lead to urinary tract infection and the aggravation of patients' condition. Complicated with urinary tract infection, patients will experience symptoms such as bladder pain during micturition. If timely and effective treatment is not given, these patients may suffer from further complications, such as bacteremia and pyelonephritis, in serious cases. As a cutting-edge nursing model, cluster nursing can make up for the defects and deficiencies of routine nursing, formulate scientific and reasonable nursing plan, and improve the quality of nursing in consideration of each patient's situation and the experience of nurses [8]. In the process of cluster nursing, evidence-based clinical nursing should be referred to; in addition, according to clinical nursing guidelines and considering the actual situation, scientific and reasonable nursing intervention should be carried out, with high purpose and sequence, to provide professional nursing services for patients. The core of cluster nursing is to provide continuous cluster nursing intervention, so as to effectively improve the nursing effect and ensure that patients receive continuous and effective nursing intervention, thus reducing the incidence of urinary tract infection.

The indwelling time of catheter, the disappearance time of bladder irritation symptoms, and the probability of urinary tract infection were compared between group A and group B after nursing intervention, showing that the nursing effect of group B was better than that of group A. Therefore, cluster nursing is worthy of extensive promotion and implementation.

In conclusion, the implementation of cluster nursing in postoperative patients with indwelling urinary catheter has a significant effect on the prevention of urinary tract infection, reducing the probability of infection and improving the quality of life of patients.

Disclosure statement

The authors declare no conflict of interest.

References

[1] He M, 2018, Application Effect of Cluster Nursing in Preventing Postoperative Patients with Indwelling Urinary Catheter Complicated with Urinary Tract Infection. Contemporary Medicine Forum, 16(17): 273-274.

[2] Guan C, 2018, Analysis of the Preventive Effect of Cluster Nursing on Urinary Tract Infection Associated with Indwelling Catheter in ICU. China Continuing Medical Education, 10(01): 144-145.

[3] Lu H, Wu H, Xie D, et al., 2017, Preventive Effect of Cluster Nursing on Catheter-Associated Urinary Tract Infection in Indwelling Catheter Patients. China Practical Medicine, 12(11): 173-174.

[4] Liao Y, Zhou Y, 2020, Effect of Cluster Nursing on Postoperative Urinary Tract Infection and Indwelling Time of Urinary Catheter in Patients with Urology. Medical Higher Vocational Education and Modern Nursing, 3(5): 354-356.

[5] Han N, 2019, Clinical Observation and Nursing Experience of Cluster Nursing Strategy in Preventing Urinary Tract Infection Associated with Urinary Catheter. Super Baby, 000(008): 246.

[6] Wang Y, Zhang N, Wang L, 2015, Application of Nursing Intervention in Preventing Urinary Tract Infection in Patients with Indwelling Catheterization. Women's Health Research, 000(022): 142.

[7] Hu X, Liang H, Tang J, 2108, Application of Home Nursing in Preventing Urinary Tract Infection in Stroke Patients with Indwelling Catheterization. China Nursing Management, 18(3): 378-381.

[8] Zhang C, Cheng X, Zhao J, et al., 2015, Application of Baiduobang Ointment in Preventing Urinary Tract Infection in Patients with Indwelling Catheterization after TURP. Journal of Qilu Nursing, 21(2): 105-107.