

# Observing the Effects of Predictive Nursing in Laparoscopic Urological Surgery

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## Abstract

**Objective:** This study aims to analyze the application value of predictive nursing in laparoscopic urological surgery. **Methods:** From February 2022 to January 2024, 78 patients undergoing laparoscopic surgery in the urology department of our hospital were randomly divided into an experimental group and a control group. The experimental group received predictive nursing, while the control group received standard nursing care. Indicators such as the length of hospital stay, incidence of complications, pain levels (Visual Analogue Scale, VAS score), and nursing satisfaction were compared between the two groups. **Results:** The length of hospital stay for the experimental group was ( $5.79 \pm 0.85$ ) days, significantly shorter than the control group's ( $6.83 \pm 0.97$ ) days ( $P < 0.05$ ). The incidence of complications in the experimental group was 0.0%, markedly lower than the control group's 12.82% ( $P < 0.05$ ). After the intervention, the VAS score of the experimental group was lower than that of the control group ( $P < 0.05$ ). The nursing satisfaction rate in the experimental group was 97.44%, higher than the control group's 79.49% ( $P < 0.05$ ). **Conclusion:** The application of predictive nursing in laparoscopic urological surgery can effectively shorten the length of hospital stay, reduce the incidence of complications, lessen pain intensity, and significantly improve patient satisfaction, demonstrating important clinical application value.

## Keywords

Predictive Nursing, Laparoscopic Surgery, Length of Hospital Stay, Nursing Satisfaction

## 1. Introduction

In clinical practice, urological diseases are numerous and varied, including kidney cancer, bladder cancer, prostate cancer, and others., which not only impair

patients' health but also significantly reduce their quality of life [1]. With the rapid development of medical technology, laparoscopic surgery has been widely applied in the treatment of urological diseases due to its unique advantages. Despite its many benefits, laparoscopic surgery remains an invasive procedure and inevitably induces a certain level of stress response and trauma in patients, such as pressure sores and subcutaneous emphysema. These complications not only cause additional discomfort but also prolong recovery time and affect patient outcomes [2] [3]. Therefore, alongside actively conducting laparoscopic surgery for urological diseases, it is crucial to enhance perioperative care for patients. Predictive nursing is a new model of nursing care that is centered on "patient-centered" care, integrating modern nursing concepts. It breaks the limitations of traditional nursing by emphasizing proactivity and prevention. By comprehensively assessing patients' conditions, psychological state, and physiological needs, it anticipates potential issues and formulates targeted nursing interventions to effectively prevent complications and promote rapid recovery. In this study, 78 patients who underwent laparoscopic surgery in the Department of Urology at our hospital between February 2022 and January 2024 were enrolled to evaluate the application value of predictive nursing in laparoscopic urological procedures.

## **2. Materials and Methods**

### **2.1. General Information**

From February 2022 to January 2024, 78 patients undergoing laparoscopic surgery in the urology department of our hospital were selected and randomly divided into an experimental group and a control group, with 39 patients in each group. The inclusion criteria for this study were as follows: (1) Patients aged 18 - 70 who underwent laparoscopic surgery in the urology department; (2) Patients who provided informed consent and signed the consent form; (3) Patients who were conscious, had normal cognitive function, and could complete the questionnaire; (4) No history of drug allergies; (5) Complete clinical data. Exclusion criteria [4]: (1) Hepatic or renal insufficiency; (2) Pregnant or lactating women; (3) Presence of systemic or localized purulent infections; (4) Severe cardiovascular or cerebrovascular diseases; (5) Hematological disorders; (6) Voluntary withdrawal or loss to follow-up during the study period; (7) History of mental illness or currently receiving psychiatric treatment.

### **2.2. Nursing Intervention Methods**

1) The control group received standard perioperative nursing, including preoperative preparation, medication guidance, and vital sign monitoring.

2) The experimental group received predictive nursing interventions in addition to the standard nursing. The specific measures were as follows:

(1) Preoperative Interventions: Health Education and Psychological Support

a) Utilize a multimedia health education model, incorporating visual materials

and video demonstrations to educate patients on disease-related knowledge, the laparoscopic surgery process, and anesthesia methods;

b) Develop personalized communication plans, patiently addressing patients' questions to alleviate preoperative anxiety;

c) Share successful cases with patients to build their confidence in the treatment;

d) Implement humanistic care, respect patient privacy, and safeguard patient dignity;

e) Employ techniques such as distraction methods, music therapy, and interest-based conversation to regulate patients' psychological states.

(2) Intraoperative Interventions: Comfort Care and Optimized Surgical Coordination

a) Provide continuous accompaniment to help patients become familiar with the operating room environment, and offer psychological support through appropriate communication techniques, such as eye contact and encouraging gestures, to alleviate fear.

b) Optimize patient positioning, using soft pillows to protect bony protrusions.

c) Implement temperature protection strategies, including the use of warming blankets or heated infusions.

d) Closely monitor vital signs and promptly address any abnormalities.

e) Standardize the process for passing surgical items to improve the efficiency of surgical cooperation.

f) Optimize surgical process management to reduce operation time.

(3) Postoperative Interventions

a) Assist with nursing care during the anesthesia recovery phase, clear oral secretions, maintain airway patency, continuously monitor vital signs, and promptly address any abnormal indicators.

b) Regularly reposition the patient (every 2 - 3 hours) and massage pressure areas to promote blood circulation.

c) Timely observe the wound condition, perform dressing changes as scheduled, and prevent infection.

d) Guide patients on proper coughing techniques to expel phlegm, and administer nebulization therapy for patients with thick sputum.

e) Implement multimodal pain management, including non-pharmacological methods (breathing exercises, acupressure, etc.), and promptly assess pain levels, providing analgesics when pain is severe.

f) Conduct simultaneous health education for family members to build a social support system and provide emotional support to the patient.

g) Develop personalized dietary plans and guide patients on balanced nutritional intake.

## 2.3. Observation Indicators

### 2.3.1. Length of Hospital Stay

Record and compare the total length of hospital stay for both groups from admis-

sion to discharge (measured in days).

### **2.3.2. Incidence of Complications**

Record the occurrence of postoperative complications in both groups, including common complications such as subcutaneous emphysema, pressure sores, and infections.

### **2.3.3. Pain Assessment**

Use the Visual Analogue Scale (VAS) to evaluate the level of pain before and after predictive nursing interventions. The VAS scale ranges from 0 to 10, with the following scoring criteria: 0 indicates no pain, 1 - 3 indicates mild pain, 4 - 6 indicates moderate pain, and 7 - 10 indicates severe pain. The score is positively correlated with the level of pain. Assessments are conducted before the intervention (1 day preoperatively) and after the intervention (24 hours postoperatively).

### **2.3.4. Evaluation of Nursing Satisfaction**

A self-designed "Patient Nursing Satisfaction Survey Questionnaire" was used for assessment. The questionnaire covered four dimensions: comfort of the treatment environment (20 points), nursing operational level (30 points), health education (30 points), and service attitude (20 points), consisting of a total of 20 items. The scoring criteria are as follows: Unsatisfactory (0 - 75 points), Fair (76 - 90 points), and Satisfactory (91 - 100 points). Overall satisfaction is calculated as (number of Fair cases + number of Satisfactory cases)/total number of cases  $\times$  100%. The survey was conducted on the day of patient discharge, with trained nursing staff responsible for distributing and collecting the questionnaires before patient discharge.

## **2.4. Statistical Analysis**

Data analysis was performed using SPSS 23.0 statistical software. Measurement data are expressed as mean  $\pm$  standard deviation ( $\bar{x} \pm s$ ), and intergroup comparisons were conducted using an independent sample t-test. Count data are expressed as numbers and percentages [n (%)], with intergroup comparisons conducted using the  $\chi^2$  test. A P-value of less than 0.05 was considered statistically significant.

## **3. Research Results**

### **3.1. Baseline Data Comparison**

A total of 79 patients were included in the study, with 39 in the experimental group (18 females and 21 males) and 39 in the control group (17 females and 22 males). The age range in the experimental group was 28 - 56 years, with an average age of ( $41.79 \pm 8.24$ ) years. The body mass index (BMI) was ( $22.15 \pm 2.36$ ) kg/m<sup>2</sup>. The control group had an age range of 26 - 55 years, with an average age of ( $41.45 \pm 8.02$ ) years, and a BMI of ( $21.98 \pm 2.18$ ) kg/m<sup>2</sup>. Statistical analysis showed no significant differences between the two groups in terms of gender composition ( $\chi^2 = 0.052$ ,  $P = 0.820$ ), age ( $t = 0.189$ ,  $P = 0.851$ ), and body mass index ( $t = 0.341$ ,  $P =$

0.734), indicating that the groups are comparable ( $P > 0.05$ ).

### 3.2. Comparison of Length of Hospital Stay

The average length of hospital stay in the experimental group was ( $5.79 \pm 0.85$ ) days, which was significantly shorter than the ( $6.83 \pm 0.97$ ) days in the control group. This difference is statistically significant ( $t = 4.0136$ ,  $P < 0.05$ ).

### 3.3. Comparison of Complication Rates

The postoperative complication rate in the experimental group was 0.0%, significantly lower than the 12.82% observed in the control group ( $P < 0.05$ ), as shown in **Table 1**.

**Table 1.** Comparison of postoperative complication rates between the two groups [n (%)].

| Group              | No. of Cases | Pressure Sores | Subcutaneous Emphysema | Infection | Incidence Rate (%) |
|--------------------|--------------|----------------|------------------------|-----------|--------------------|
| Experimental Group | 39           | 0 (0.0)        | 0 (0.0)                | 0 (0.0)   | 0.0                |
| Control Group      | 39           | 2 (5.13)       | 2 (5.13)               | 1 (2.56)  | 12.82              |
| $\chi^2$           |              |                |                        |           | 6.7139             |
| P                  |              |                |                        |           | 0.0324             |

### 3.4. Comparison of VAS Scores

There was no statistically significant difference in VAS scores between the two groups before the intervention ( $P > 0.05$ ). After the intervention, the VAS score in the experimental group was ( $2.71 \pm 0.64$ ), significantly lower than the control group's ( $3.98 \pm 0.82$ ) ( $P < 0.05$ ), as shown in **Table 2**.

**Table 2.** Comparison of VAS scores between the two groups before and after intervention (scores,  $\bar{x} \pm s$ ).

| Group              | No. of Cases | Before Intervention | After Intervention |
|--------------------|--------------|---------------------|--------------------|
| Experimental Group | 39           | $5.78 \pm 1.69$     | $2.71 \pm 0.64$    |
| Control Group      | 39           | $5.42 \pm 1.91$     | $3.98 \pm 0.82$    |
| t                  |              | 0.1359              | 4.0527             |
| P                  |              | 0.2146              | 0.0000             |

### 3.5. Comparison of Nursing Satisfaction

The nursing satisfaction rate in the experimental group was 97.44%, significantly higher than the 79.49% in the control group ( $P < 0.05$ ), as shown in **Table 3**.

**Table 3.** Comparison of nursing satisfaction between the two groups [n (%)].

| Group              | No. of Cases | Unsatisfactory | Fairly Satisfactory | Satisfactory | Satisfaction Rate |
|--------------------|--------------|----------------|---------------------|--------------|-------------------|
| Experimental Group | 39           | 1 (2.56)       | 10 (25.64)          | 28 (71.79)   | 97.44             |

Continued

|               |    |           |            |            |        |
|---------------|----|-----------|------------|------------|--------|
| Control Group | 39 | 8 (20.51) | 15 (38.46) | 16 (41.03) | 79.49  |
| $\chi^2$      |    |           |            |            | 7.2158 |
| P             |    |           |            |            | 0.0263 |

4. Discussion

The results of this study indicate that predictive nursing offers significant advantages in the perioperative management of patients undergoing urological laparoscopic surgery. These advantages include reduced hospital stay, lower incidence of complications, decreased pain levels, and increased nursing satisfaction, ultimately improving patient outcomes. These findings are consistent with previous research [5].

Laparoscopic surgery, as a commonly used minimally invasive treatment in urology, has the benefits of minimal invasion and reduced pain. However, being an invasive procedure, it can still have a certain impact on patients' physical and mental well-being. Moreover, most patients have insufficient awareness of their condition and concerns about postoperative complications, making them more prone to anxiety and fear, which reduces their compliance and affects their early recovery [6] [7]. During the perioperative period, although conventional nursing can provide basic care services, it often falls short of meeting patients' diverse needs, particularly in areas like psychological support, pain management, and complication prevention, leading to ineffective improvement in nursing quality [8]. Predictive nursing, as a novel approach, maximizes the "patient-centered" nursing concept. It encompasses various aspects such as pain management, family support, position management, emotional counseling, dietary adjustments, cognitive interventions, and wound management. Through systematic interventions, predictive nursing provides refined care to patients, reducing the incidence of complications and thereby improving patient outcomes [9].

The results of this study show that the average hospital stay in the experimental group was reduced by 1.04 days compared to the control group. This can be attributed to predictive nursing, which optimizes perioperative management processes, enhances health education, and improves patient compliance, thereby accelerating the postoperative recovery process and shortening the hospital stay [10]. In terms of complication prevention, the experimental group experienced no complications such as pressure sores, subcutaneous emphysema, or infections, significantly superior to the control group (12.82%). This success is due to measures in predictive nursing, such as standardized position management and strict infection control. Regarding pain management, the post-intervention VAS scores in the experimental group were significantly lower than those in the control group. Predictive nursing effectively alleviated postoperative pain through multimodal analgesia strategies combined with non-pharmacological interventions, leading to improved patient outcomes and significantly enhanced nursing satisfaction [11] [12].

## 5. Conclusion

This study confirms that predictive nursing can significantly improve the clinical outcomes of patients undergoing urological laparoscopic surgery. Specifically, it shortens hospital stays, reduces the incidence of complications, alleviates postoperative pain, and improves nursing satisfaction. Therefore, it is recommended that predictive nursing be adopted as the preferred nursing model for patients undergoing urological laparoscopic surgery and promoted in clinical practice. Future research will further explore the long-term effects of predictive nursing and its application value across different types of surgeries.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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