

## ORIGINAL RESEARCH

# Evaluation on the efficacy of nursing intervention based on the self-efficacy theory model in elderly patients undergoing total laparoscopic hysterectomy

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**Abstract**

The effectiveness of nursing interventions based on the self-efficacy in elderly patients receiving total laparoscopic hysterectomy was assessed. 100 senior patients undergoing total laparoscopic hysterectomy were committed to our hospital from January 2020 to February 2021. Patients were randomized into the study group ( $n = 51$ ) and control group ( $n = 49$ ), according to the time of surgery. The control group was given a conventional care plan, while the study group was given conventional care plus a nurse intervention based on a self-efficacy plan. The total post-operative disease uncertainty scores were relatively lower than before surgery both in the control group and the study group ( $p < 0.05$ ). In particular, the disease uncertainty scale in the post-operative group was reduced in the study group as compared to that in the control group ( $p < 0.05$ ). The post-operative self-efficacy scale scores of patients in the control group and the study group were increased than that in the pre-operative patients ( $p < 0.05$ ). In particular, the post-operative self-efficacy scale scores of patients in the study group were higher than that in the control group. Patients in the study group had a lower incidence of post-operative complications than that in the control group. After one year of follow-up, the overall Pelvic Floor Distress Inventory-20 (PFDI-20) scores at 3 months and 12 months were statistically significant higher than pre-operative scores ( $p < 0.05$ ). In particular, the post-operative patients' pelvic floor function in the study group were lower than that in the control group. It seems that a self-efficacy-based nursing intervention program applied to elderly patients after laparoscopic total hysterectomy was effective in improving patients' disease uncertainty and self-efficacy, shortening the length of hospital stay and reducing the incidence of postoperative complications, with little impact on pelvic floor function.

**Keywords**

Elderly patient; Total laparoscopic hysterectomy; Self-efficacy theory; Nursing intervention; Pelvic floor function

## 1. Introduction

Uterine fibroids are the most common benign tumors of the female genitalia and the most prevalent tumors in the human body. It is caused by the proliferation of smooth muscle tissue of the uterus, interspersed with a small amount of fibrous connective tissue, and depending on the size and location of the tumor, uterine fibroids may be single or numerous. Adenomyoma is characterized by an aberrant invasion of endometrial glands into the myometrium, which results in uterine disease. In recent years, the incidence of uterine fibroids and adenomyoma among the elderly has been on the rise as the population ages and the environment continues to deteriorate. Currently, a total hysterectomy is one of the primary treatments for benign tumors in the elderly. Total hysterectomy is one of the main modalities for treating innocent tumors in elderly women, such

as uterine fibroids and adenomyomas. Nevertheless, patients may experience severe psychological distress as a result of the removal of the uterus. Additionally, the frail physical state of the elderly may lead to stress reactions, which is not ideal for the smooth implementation of operations and the patient's post-operative recovery. Therefore, adequate post-operative care is essential for elderly patients undergoing transabdominal total hysterectomy. The American psychologist Bandura introduced the theory of self-efficacy in 1977 as a primary concept in the social cognitive approach. Specifically, it refers to an individual's subjective evaluation of whether his or her capacity to behave in a way that achieves the desired outcome [1]. The development on nursing intervention strategies based on the self-efficacy model has been proven to enhance self-efficacy and self-management, minimize the occurrence of post-operative complications, and dramatically expedite the

recovery of perioperative patients [2, 3]. However, there is insufficient data to demonstrate the feasibility and effectiveness of improving the recovery of elderly patients undergoing total hysterectomy. This study develops a post-operative care program for elderly individuals undergoing transabdominal total hysterectomy based on the self-efficacy theory. The program was used in clinical care to verify its effectiveness, safety, and feasibility in promoting early recovery in elderly surgical patients and to provide a theoretical foundation for the development of self-efficacy theory in gynecology.

## 2. Materials and Methods

### 2.1 General Information

A total of 100 aged patients who underwent total hysterectomy in our unit from January 2020 to February 2021 were enrolled and divided into two groups according to the time of surgery: the study group ( $n = 51$ ) and the control group ( $n = 49$ ). In the control group, the average age was ( $67.51 \pm 3.98$ ) years, 26 women had uterine fibroids, and 20 women had adenomyosis. In the study group, the mean age was ( $66.75 \pm 3.78$ ) years, and there were 52 and 48 cases, respectively.

### 2.2 Inclusion criteria

(1) Age (60–74 years); (2) benign uterine disease; (3) eligible for transabdominal total hysterectomy surgery; and (4) complete clinical data.

### 2.3 Exclusion criteria

(1) Malignant uterine disease; (2) combined other reproductive infectious diseases, malignant neoplasms, and severe chronic underlying disorders; (3) presence of linguistic and communication impairments, psychiatric and cognitive abnormalities; and (4) reluctance to participate in this study.

### 2.4 Procedures

The control group received standard medical attention. Details: (1) Upon admission, the responsible nurse introduced patients to the ward to enable patients rapidly understand and become familiar with the hospital environment and daily activities. (2) On the day before surgery, health instructions on pre-operative precautions, such as water fasting period, the purpose and administration of pre-operative medication, numerous examinations and specimen retention cautions, *etc.*, were delivered; (3) After surgery, patients and their families have been primarily instructed on the management of pelvic drains, dietary restrictions, and preventive measures for complications. (4) On the day of discharge, the pertinent attention was informed to the patients and their caregivers by the guidelines established by the department. Additional oral discharge directions for precautions were provided to remind the patients to return to the hospital for a visit on time and to seek medical consultation if there was any discomfort.

On the basis of the control group, the study group obtained nursing treatments dependent on self-efficacy theory. Specific content: (1) Direct experience: To describe the causes of morbidity, clinical manifestations, pre- and post-operative care,

and other medical content relevant to this illness knowledge, the inspector carried a video regarding the nursing information of total hysterectomy to the patient's bedside, and also delivered emotional encouragement; then, instructed the patients on the essentials of off-bed exercise and patiently addressed the individual's concerns to ensure that they understand the missionary content. (2) Indirect experience: Organize exchange meetings with patients in the ward to communicate and share experiences about disease prevention and treatment, raising awareness and reconstructing confidence in conquering the disease. (3) Verbal persuasion: Perform an excellent job of communicating well with patients, comprehending the current life quality of elderly patients, attentively listening to patients' requirements, assessing the patient's level of self-efficacy and uncertainty about the condition, and giving supportive psychological implications to avoid the adverse emotional sensation. In addition, encourage relatives to accompany patients more frequently and to offer them greater support. (4) Physical and emotional states: Remind patients to employ empathy treatment to shift their attention and mellow or even get rid of negative feelings such as anxiety and annoyance, fear and tension. For anxiety or depression, use suggestion therapy or compliant emotion and volitional therapy such as mental relaxation and breathing control training to improve self-regulation and psychological contingency.

## 2.5 Evaluation indicators

### 2.5.1 Sense of disease uncertainty

The Disease Uncertainty Scale [4], contains four dimensions, including uncertainty (13 entries), lack of information (5 entries), complexity (7 entries), and unpredictability (7 entries), for a total of 33 items was used to evaluate the sense of illness uncertainty. Each entry was scored on a 5-point Likert scale from 32 to 160, with higher scores indicating higher level of disease uncertainty among patients.

### 2.5.2 Sense of self-efficacy

The General Self-Efficacy Scale (GSES) [5], comprising a total of 10 items, was used to evaluate the sense of self-efficacy in patients and each item was expressed with the 4-point Likert scale from 10 to 40, indicating that better scores have greater self-efficacy.

### 2.5.3 Post-operative complication rate

Using the hospital's electronic health records quality management system and sheet medical records, the post-operative complications (incisional hernia, urinary tract injury, intestinal tube damage, post-operative infection, stumps hemorrhage, *etc.*) were collected. Post-operative complication rate = patients with post-operative complications/total number of patients  $\times 100\%$ .

### 2.5.4 Pelvic floor function

After one year of surgical follow-up in both groups (ending on 26 February 2022), the PFDI-20 questionnaire [6] was used to examine pelvic floor function at 3 and 12 months, respectively. 20 assessment items made up the PFDI-20 questionnaire, assessing symptoms in 3 dimensions: bladder, bowel, and pelvis.

**TABLE 1. Comparison on the patients' sense of disease uncertainty between two groups before and after operation.**

Program	Pre-operative		Post-operative	
	Control	Study	Control	Study
Uncertainty	60.06 ± 9.29	59.22 ± 9.77	40.61 ± 8.48*	33.80 ± 8.46 <sup>a</sup>
Lack of information	22.14 ± 1.90	21.86 ± 1.92	18.33 ± 1.85*	14.98 ± 1.91 <sup>a</sup>
Complexity	32.06 ± 2.12	31.49 ± 1.80	23.80 ± 1.89*	20.88 ± 1.59 <sup>a</sup>
Unpredictable	32.10 ± 1.87	31.73 ± 1.96	26.71 ± 1.96*	23.00 ± 2.02 <sup>a</sup>
Total scores	146.40 ± 9.19	144.30 ± 10.19	109.40 ± 9.10*	92.67 ± 9.02

Compared with pre-operative, \* $p < 0.05$ ; compared with control group, <sup>a</sup> $p < 0.05$ .

Each item was scored by a 5-point Likert scale of “no symptoms”, “no effect”, “mildly affected”, “moderately affected”, and “severely affected” on a scale from 0 to 4, respectively. The mean score (0–4) is multiplied by 25 and the range for each dimension is 0–100. The total score was the sum of the values for three dimensions, ranging from 0 to 300, with higher score indicating more severe pelvic floor dysfunction.

## 2.6 Statistical analysis

All data were statistically analyzed using SPSS (22.0, IBM Company, Chicago, USA). The Shapiro-Wilk test revealed that measurement materials exhibited a normal distribution. The measurement materials were expressed as mean ± standard deviation (SD), and the Student's *t*-test was used to compare between two groups. Categorical data were expressed as%, and differences between groups were assessed using the  $\chi^2$  test.  $p \leq 0.05$  were regarded as statistically significant.

## 3. Results

### 3.1 Comparisons on the patients' sense of disease uncertainty between two groups before and after operation

The disease uncertainty scale, which contains four dimensions, including uncertainty, lack of information, complexity, and unpredictability, were used to evaluate the sense of disease uncertainty. The comparisons between the control group and the study group were shown in Table 1. The total post-operative disease uncertainty scores were relatively lower than before surgery both in the control group and the study group ( $p < 0.05$ ). In particular, the disease uncertainty scale in the post-operative group was reduced in the study group as compared to that in the control group ( $p < 0.05$ ).

### 3.2 Comparisons on the patients' self-efficacy comparison between two groups before and after operation

As shown in Table 2, the post-operative self-efficacy scale scores of patients in the control group and the study group were increased than that in the pre-operative patients ( $p < 0.05$ ). In particular, the post-operative self-efficacy scale scores of patients in the study group were higher than that in the control group ( $p < 0.05$ ).

**TABLE 2. Comparisons on the patients' self-efficacy between two groups before and after operation.**

Groups	Pre-operative	Post-operative
Control group (n = 49)	13.14 ± 1.98	19.00 ± 2.01
Study group (n = 51)	12.75 ± 1.90	24.12 ± 1.79
<i>t</i>	1.027	13.470
<i>p</i>	0.307	0.000

### 3.3 Comparisons on the patients' post-operative complications between groups

The post-operative complications including incisional hernia, urinary tract injury, intestinal tube damage, post-operative infection, stumps hemorrhage were collected. According to Table 3, patients in the study group had a lower incidence of post-operative complications than that in the control group ( $p < 0.05$ ).

### 3.4 Comparisons of patients' pelvic floor function between two groups

The patients' pelvic floor function was assessed through 3 dimensions: bladder, bowel, and pelvis. As shown in Table 4, after one year of follow-up, the overall PFDI-20 scores at 3 months and 12 months were statistically significant higher than pre-operative scores ( $p < 0.05$ ). In particular, the post-operative patients' pelvic floor function in the study group were lower than that in the control group ( $p < 0.05$ ).

## 4. Discussion

Due to psychological and age-related variables, aging patients undergoing total hysterectomy have difficulty categorizing and perceiving disease-related information throughout the treatment process, resulting in a generally low sense of self-efficacy and a high grade of disease uncertainty [7, 8]. Increased self-efficacy reduced the sense of disease uncertainty in patients and has been further used as an effective approach to enhance self-management capability. In turn, self-efficacy is influenced by the age of patients, psychological variables, disease perception, and social support are all factors that influence [9]. Therefore, strengthening the self-cognition of elderly patients undergoing total hysterectomy, improving their mental health, and providing them with social support and

**TABLE 3. Comparisons on the of patients' postoperative complications between two groups.**

Groups	Incisional hernia	Urinary tract injury	Intestinal tube damage	Post-operative infection	Stump hemorrhage	Incidence of post-operative complications
Control group (n = 49)	3	1	2	1	4	22.45% (11/49)
Study group (n = 51)	0	1	0	1	2	7.84% (4/51)
$\chi^2$						4.181
<i>P</i>						0.041

**TABLE 4. Comparisons on the pre-operative and post-operative (3 months and 12 months) pelvic floor function in the two groups.**

Items	Pre-operative		3 months after surgery		12 months after surgery	
	Control	Study	Control	Study	Control	Study
Bladder	20.88 ± 5.60	21.92 ± 6.59	50.31 ± 4.19*	40.41 ± 6.03* <sup>a</sup>	37.49 ± 5.98*	31.29 ± 5.86* <sup>a</sup>
Intestine	16.57 ± 5.80	16.75 ± 5.39	43.12 ± 5.16*	36.84 ± 5.54* <sup>a</sup>	28.53 ± 6.13*	21.20 ± 5.22* <sup>a</sup>
Pelvic	28.12 ± 3.94	27.86 ± 4.83	62.98 ± 4.05*	57.08 ± 4.10* <sup>a</sup>	40.86 ± 3.96*	32.76 ± 4.49* <sup>a</sup>
Total Scores	65.57 ± 7.46	66.53 ± 10.28	155.90 ± 8.59*	134.30 ± 10.32* <sup>a</sup>	106.90 ± 9.92*	85.25 ± 8.48* <sup>a</sup>

Compared with pre-operative, \* $p < 0.05$ ; compared with control group, <sup>a</sup> $p < 0.05$ .

specialized medical treatment may be effective in developing their self-efficacy. In this study, a self-efficacy care intervention program was constructed based on the self-efficacy paradigm in four areas: direct experience, indirect experience, verbal persuasion, and physical and emotional states. The findings indicated that relative to the control group, the overall and individual dimension scores of illness uncertainty and self-efficacy scale ratings decreased in the study group with intervention measures. A possible explanation for this is that when patients were admitted to the hospital, nurses employed various forms and provided a variety of support forces to educate the senior patients, improving their recognition of uterine disorders, total hysterectomy, and variables influencing post-operative recovery. This can help to disrupt the confusion and apprehensive conditions when dealing with issues related to the disease diagnosis and treatment of their disease, and convince them that their correct behavior could promote clinical recovery [10].

Transabdominal total hysterectomy has become the most widely used total hysterectomy due to the advantages of a large surgical field and the simplicity of intraoperative hemostasis. However, this procedure also has significant disadvantages and is prone to post-operative complications such as incisional hernia and intestinal canal damage [11, 12]. This study found that the study group experienced fewer hospitalization days and a lower frequency of post-operative complications than the control group, similar to the research by Li *et al.* [7] and Yu *et al.* [13]. These investigations revealed that under the nursing intervention model, the psychological, physical, and social care needs of elderly patients can be met, with patients' disease perceptions and their psychological status improving. As a result, they fell confident in the treatment and care and believe that the medical professionals' professional medical

care to satisfactorily ensure surgical recovery and prognosis. Accordingly, the self-efficacy interference strategy can significantly reduce the occurrence of post-surgery complications in elderly patients undergoing total hysterectomy, facilitating their recovery, and shortening their hospital stay.

The main uterine ligament, sacral ligament, and surrounding fascial tissues are removed during transabdominal total hysterectomy, which compromises the integrity of the pelvic floor structures and results in dysfunction. Besides, damage to the pelvic visceral nerves and the inferior abdominal plexus, which innervate the bladder, may lead to post-operative urinary and defecatory dysfunction. Consequently, evaluation of pelvic function in terms of the bladder, intestine, and pelvis has emerged as a major prognostic indicator after total hysterectomy [14, 15]. In line with these above results, our study also demonstrated an increment of overall and each dimension scores in PFDI-20 at 3 and 12 months after surgery in both groups compared to the pre-operative period. These results suggested that radical hysterectomy impedes the pelvic floor performance of patients in the immediate and long-term. Notably, following a care intervention based on self-efficacy theory, the total PFDI-20 score and scores on all dimensions were diminished in the elderly individuals than in the usual care group at 6 and 12 months postoperatively. The proposed reason was that the elderly patients given the self-efficacy instrument were aware of the deterioration of postpartum pelvic floor movements prior to radical hysterectomy. In addition to relieving the patients' psychological anguish, these also empowered patients to actively manage their condition, strengthening treatment outcomes and minimizing the risk of impaired pelvic floor function [16].



## 5. Conclusions

In conclusion, a nursing interference based on the concept of self-efficacy in elderly patients after total hysterectomy was successfully in enhancing patients' perception of illness confusion and managerial efficacy, shortening the days of hospitalization, reducing the frequency of complications after surgery, and having less impact on long-term pelvic floor function. However, there are certain restrictions due to the relatively small sample size and the fact that all subjects were recruited from the gynecology division of our hospital. Further research is needed by expanding the sample size and conducting multicenter investigations.

### AVAILABILITY OF DATA AND MATERIALS

The authors declare that all data supporting the findings of this study are available within the paper and any raw data can be obtained from the corresponding author upon request.

### AUTHOR CONTRIBUTIONS

BBL, YLL and XG—designed the research study. BBL, YLL and XG—performed the research. BBL, YLL and XG—analyzed the data. BBL, YLL and XG—wrote the manuscript. All authors read and approved the final manuscript.

### ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval was obtained from the Fifth Affiliated Hospital of Xinjiang Medical University (Approval no. XYDWFYLSk-2019-29). Written informed consent was obtained from a legally authorized representative(s) for anonymized patient information to be published in this article.

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### CONFLICT OF INTEREST

The authors declare no conflict of interest.

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