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Original Article

Efficiency of evidence-based collaborative nursing on complications, negative emotions and quality of live in radical prostatectomy

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Abstract: Objective: To evaluate the effectiveness of evidence-based collaborative nursing in reducing complications, alleviating negative emotions, and improving the quality of life in patients undergoing radical prostatectomy. Methods: In this retrospective study, Sixty-three patients who underwent surgery for prostate cancer between September 2021 and August 2022 were included as the control group, while 75 patients hospitalized between September 2022 and August 2023 were selected as the observation group. All these patients were treated at Tianjin Medical University General Hospital. The control group received routine nursing care, while the observation group received evidence-based collaborative nursing in addition to standard care. Complications, emotional state, self-care ability, fear of disease progression, quality of life, urodynamic index and the satisfaction with care were compared and analyzed between the two groups. Results: The observation group experienced significantly fewer complications than the control group ($P<0.05$). After intervention, both groups showed a significant reduction in negative emotional scores and an increase in positive emotional scores compared to pre-intervention (all $P<0.05$), with the observation group demonstrating more pronounced alterations (all $P<0.05$). Self-care ability scores in both groups improved significantly post-intervention ($P<0.05$), with the observation group showing higher scores than the control group ($P<0.05$). Scores related to fear of disease progression were significantly lower in both groups post-intervention, with the observation group showing a greater reduction ($P<0.05$). Quality of life scores in the functional dimension improved and symptom scores decreased in both groups post-intervention ($P<0.05$), with the observation group showing better outcomes than the control group ($P<0.05$). Urodynamic indices, including maximum urine flow, maximum urethral closure, and maximum bladder capacity, improved significantly in both groups post-intervention ($P<0.05$), with the observation group outperforming the control group ($P<0.05$). Additionally, the observation group reported higher satisfaction with nursing care compared to the control group ($P<0.05$). Conclusion: Evidence-based collaborative caring significantly improves emotional well-being, enhances self-care ability and quality of life, and reduces postoperative complications in patients undergoing radical prostatectomy. This approach holds great potential for broader clinical application.

Keywords: Evidence-based medicine, collaborative nursing, prostate cancer, radical surgery, postoperative complications, negative emotions, quality of life

Introduction

Prostate cancer is the most common malignant tumor affecting the reproductive and urinary systems in elderly men and it is the fifth leading cause of death among males. With the changes in the global environment, the incidence of prostate cancer has been increasing annually, severely impacting the physical and mental health, and life expectancy of affected patients [1]. Radical prostatectomy is the primary treatment for early-stage prostate cancer. Nevertheless, the operation involves the removal of the patient's sexual organs, which can be challenging for many to accept, leading to varying degrees of psychological distress. In addition, surgical trauma and high incidence of postoperative complications further aggravates the negative emotions of patients after radical surgery, significantly affecting their postoperative quality of life [2].

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Evidence-based medical care is a new nursing mode guided by scientific evidence, incorporating the professional skills of healthcare providers, relevant research findings, and the specific needs of patients [3, 4]. This model facilitates the development of well-informed nursing decisions and plans by rigorously integrating the latest scientific research with the clinical expertise of nurses and the individual circumstances of the patient. By tailoring care strategies to each patient's condition, evidence-based nursing ensures a higher quality of service delivery [5].

Collaborative care, based on responsibility-based care, emphasizes patient self-care ability and encourages active participation from both patients and their families. This approach allows for a more efficient and reasonable use of available resources [6]. To further improve the psychological well-being and quality of life of prostate cancer patients following surgery, our hospital implemented an evidence-based collaborative nursing model beginning September 2022. This study aims to evaluate the effectiveness of evidence-based collaborative nursing in reducing complications, alleviating negative emotions, and improving the quality of life in patients undergoing radical prostatectomy.

Materials and methods

Clinical profile

In this retrospective study, 63 patients who underwent surgical treatment for prostate cancer between September 2021 and August 2022 were included as the control group, while 75 cases hospitalized from September 2022 to August 2023 were included as the observation group. All patients were treated at Tianjin Medical University General Hospital, and the study was approved by the Hospital Ethics Committee.

Inclusion and exclusion criteria

Inclusion criteria: (1) Patients diagnosed with prostate cancer by prostate biopsy and who underwent laparoscopic radical prostatectomy [7]. (2) Patients with normal mental and verbal communication abilities. (3) Patients with complete clinical data. (4) Patients with primary school education level or above. (5) Patients with stable postoperative vital signs.

Exclusion criteria: (1) Patients with significant declines in vital organ function (e.g., heart, liver, kidney). (2) Patients who died during surgery. (3) Patients with concomitant malignant tumors. (4) Patients with contraindications to laparoscopic radical prostatectomy.

Methods

All procedures were performed by the same group of doctors and nurses in our department. Patients in the control group received routine nursing interventions, including preoperative health education, preoperative psychological care, postoperative management, dietary guidance, postoperative activity guidance, and postoperative complication management.

The observation group received evidence-based collaborative nursing interventions in addition to the routine care provided to the control group. The specific nursing process for the observation group: (1) A nursing intervention team consisting of 1 attending physician, 1 head nurse and 2 specialist nurses was established. The team underwent a four-week training period to study theoretical knowledge and methods related to evidence-based nursing and collaborative care before the intervention. (2) The nursing intervention team conducted an overall analysis of the condition of patients undergoing prostatectomy. According to the analysis results, the team members identified factors contributing to postoperative complications and developed evidence-based questions for further investigation. (3) The team gathered evidence from professional books and online literature on prostate cancer. Chinese literature was sourced from databases such as CNKI and Wanfang, while English literature was primarily sourced from Pubmed. The reliability of the retrieved evidence was scientifically assessed, and the team also incorporated clinical nursing experience. The findings provided theoretical support for the development of perioperative and personalized nursing plans. (4) Using the evidence-based program, the team applied collaborative nursing during the perioperative period of radical prostatectomy. Upon admission, nursing staff actively communicated with patients and their families to assess psychological status, provide education on the disease, explain surgical methods, and offer

guidance on diet, medication, and early postoperative activities.

Nurses, in collaboration with physicians, reassured patients that laparoscopic surgery offers the same efficacy as traditional open surgery, while providing additional benefits such as less trauma and quicker recovery. In this way, the medical team helped to dispel the patients' concerns and encouraged them and their families to actively participate in the care process. The team also provided perioperative education on nutrition and immunity. Patients and their families were instructed on diet, such as consuming high-calorie, high-protein, high-vitamin and easily digestible foods. Early postoperative mobilization was emphasized to both patients and family members. The medical team explained the benefits of early mobilization in preventing venous embolism and pulmonary infection, and instructed family members to assist with passive and active exercises. Upon discharge, the nursing team assessed each patient's condition and developed individualized care plans. Families were encouraged to monitor the patient's psychological state, promote social activities, make diet plans based on dietitians' suggestions, and support postoperative rehabilitation exercises. The nursing intervention continued for three months after discharge.

Observation of indicators

Incidence of complications: The incidence of complications were recorded in both groups, including urinary incontinence, urinary tract infection and pressure sores.

Emotional state: The Chinese version of Positive and Negative Affect Schedule (PANAS) was applied to evaluate the emotional state of patients [8]. The scale includes Negative Affect (NA) scale and Positive Affect (PA) scale, each with 10 descriptive adjectives. The total score ranges from 0 to 50 for each subscale, with higher scores indicating a stronger emotional response. The Cronbach α coefficient of the PANAS scale ranged from 0.83 to 0.85, ensuring good reliability.

Self-care ability: The Evaluation of Self Care Activities (ESCA) scale was used to assess patients' self-care ability [9]. The scale consists of four dimensions and 43 items, including self-concept (8 items), self-responsibility (6 items), self-care skills (12 items) and health knowledge level (17 items). Each item is scored from 0 to 4, with a total possible score ranging from 0 to 172. The higher scores indicated better self-care ability. The Cronbach α coefficient for the ESCA scale was 0.836.

Fear of disease progression: The Fear of Progression Questionnaire (FoP-Q) was used to assess patients' fear of disease progression [10]. The scale contains 41 items in 5 dimensions, including emotional response (11 items), anxiety coping (14 items), loss of autonomy (6 items), occupational concerns (5 items), and family relationship (5 items). Each item is scored from 1-5, with lower scores indicating less fear of disease progression. The Cronbach α coefficient for the scale was 0.872.

Quality of life: The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) was adopted to assess quality of life [11]. The scale includes 8 dimensions (5 functional dimensions and 3 symptom dimensions). The five functional dimensions include physical function, emotional function, role function, cognitive function, and social function, respectively. The symptom dimensions included nausea/vomiting, pain and fatigue. Higher scores in the functional dimensions indicate better quality of life, while higher scores in the symptom dimensions indicate more severe symptoms. The coefficient of Cronbach α for the scale was 0.851.

Urodynamic index: Urodynamic indicators, including maximum urine flow, maximum urethral closure pressure, and maximum bladder capacity, were detected by urodynamic analyzer before and after intervention.

Satisfaction with nursing: A self-designed nursing satisfaction questionnaire was used to investigate patient satisfaction with nursing after intervention. The questionnaire consisted of 20 items, each scored 1-5 points. Total scores ranged from 0 to 100, with scores of 90-100 indicating very satisfied, 80-89 indicating satisfied, and scores below 80 indicating dissatisfaction. The satisfaction rate = (very satisfied + satisfied)/total number of cases × 100%.

Table 1. Comparison of clinical data between the two groups

Clinical data	Observation group (n=75)	Control group (n=63)	$t/\chi^2/Z$	*P*
Age (yrs, $\bar{x}\pm s$)	67.39±7.22	66.95±6.95	0.363	0.717
Gleason score (points, $\bar{x}\pm s$)	7.06±0.83	7.04±0.79	0.144	0.886
Education degree				
Junior high school and below	44	35	0.135	0.713
High school and above education	31	28		
Marital status				
Married	46	40	0.068	0.794
Unmarried/divorced/widowed	29	23		
Pathological types				
Adenocarcinoma	68	57	-0.076	0.939
Squamous cell carcinoma	5	3		
Neuroendocrine carcinoma	2	3		
Preoperative PSA (ng/ml, $\bar{x}\pm s$)	17.62±4.15	18.01±3.97	0.561	0.576
PSA one week after the operation (ng/ml, $\bar{x}\pm s$)	0.38±0.14	0.40±0.12	0.892	0.374

Note: PSA: prostate-specific antigen.

Table 2. Comparison of the incidence of complications [n (%)]

Group	Number of cases	Urinary incontinence	Urinary tract infection	Pressure ulcer	Total
Observation group	75	3 (4.00)	2 (2.67)	2 (2.67)	7 (9.33)
Control group	63	7 (11.11)	3 (4.76)	4 (6.35)	14 (22.22)
χ^2	-	-	-	-	4.409
P	-	-	-	-	0.036

The internal consistency reliability was confirmed with a Cronbach's alpha score of 0.873.

Statistical analysis

SPSS 27.0 was adopted for statistical analysis. Measurement data were expressed as ($\bar{x}\pm s$), and count data were expressed as percentages. Quantitative data were compared using the t-test, count data were compared using the χ^2, and ordinal data were analyzed using rank sum test. A *P*-value of less than 0.05 was considered statistically significant.

Results

Comparison of clinical data between the two groups

There were no statistically significant differences between the two groups in terms of age, Gleason score, education level, marital status, or pathological type (all *P*>0.05), as shown in **Table 1**.

Comparison of incidence of complications between the two groups

There were 3 cases of urinary incontinence, 2 cases of urinary tract infections, and 2 cases of pressure ulcers in the observation group, with a postoperative complication rate of 9.33%. In the control group, there were 7 cases of urinary incontinence, 3 cases of urinary tract infections, and 2 cases of pressure ulcers, with a postoperative complication rate of 22.22%. The observation group had notably fewer postoperative complications than the control group (*P*<0.05) (**Table 2**).

Comparison of emotional states between the two groups

There was no statistical difference in scores of negative emotion and positive emotion between the two groups before intervention (both *P*>0.05). After intervention, both groups experienced a significant decrease in negative emo-

Table 3. Comparison of emotional states (points, $\bar{x}\pm s$)

Group	Number of cases	Negative affect		Positive affect	
		Before intervention	After intervention	Before intervention	After intervention
Observation group	75	36.48±3.42	18.39±3.21	20.39±2.97	35.40±3.52
Control group	63	35.95±3.17	23.42±2.98	20.85±2.70	31.32±2.84
t	-	0.397	9.472	0.944	7.396
P	-	0.350	<0.001	0.347	<0.001

Table 4. Comparison of self-care capability (points, $\bar{x}\pm s$)

Index	Observation group (n=75)				Control group (n=63)			
	Before intervention	After intervention	t	P	Before intervention	After intervention	t	P
Self-concept	22.37±3.10	29.16±3.25*	13.092	<0.001	22.08±2.79	25.93±2.96	7.513	<0.001
Self-responsibility	14.95±2.39	22.28±2.67*	17.715	<0.001	15.27±3.01	19.64±2.55	8.793	<0.001
Self-care skills	30.28±3.27	40.08±4.21*	15.921	<0.001	29.85±2.69	36.41±4.03	10.746	<0.001
Health knowledge degree	47.58±3.62	61.12±5.29*	18.293	<0.001	48.02±3.88	56.06±4.28	11.047	<0.001

Note: Compare with control group, *$P<0.05$.

Table 5. Comparison of fear of disease progression (points, $\bar{x}\pm s$)

Index	Observation group (n=75)				Control group (n=63)			
	Before intervention	After intervention	t	P	Before intervention	After intervention	t	P
Emotional response	43.38±6.95	17.69±3.20*	29.077	<0.001	44.05±7.21	23.84±4.95	18.342	<0.001
Occupation	20.52±3.94	11.52±1.36*	18.700	<0.001	20.83±4.11	14.28±1.58	11.807	<0.001
Loss of autonomy	21.95±3.16	12.15±1.94*	22.889	<0.001	22.18±3.52	16.03±2.18	11.790	<0.001
Coping with anxiety	31.58±4.59	16.38±2.63*	24.884	<0.001	32.01±3.98	21.24±2.39	18.414	<0.001
Family relationships	21.85±3.06	14.52±1.79*	17.906	<0.001	22.16±3.22	17.48±2.10	9.663	<0.001

Note: Compare with control group, *$P<0.05$.

tional scores and an increase in positive emotional scores (all $P<0.05$) compared to pre-intervention. Among them, the observation group had significantly lower negative emotional scores and higher positive emotional scores compared to the control group after the intervention (all $P<0.05$) (**Table 3**).

Comparison of self-care capability between the two groups

The two groups demonstrated no significant difference in self-care ability before intervention ($P>0.05$). After the intervention, the self-care capability scores across all dimensions in both groups increased significantly compared to pre-intervention scores ($P<0.05$). Additionally, the observation group had significantly higher post-intervention self-care scores than the control group (P<0.05) (**Table 4**).

Comparison of fear of disease progression between the two groups

Before the intervention, there was no significant difference in fear of disease progression between the two groups ($P>0.05$). After intervention, both groups showed a significant reduction in fear of disease progression compared to their pre-intervention levels ($P<0.05$), and the observation group had a notably lower score than control group ($P<0.05$) (**Table 5**).

Comparison of quality of life between the two groups

Pre-intervention, the two groups showed no significant differences in quality of life, functional scores, or symptom scores (all $P>0.05$). After the intervention, the functional dimension scores of both groups improved significantly compared to pre-intervention ($P<0.05$), while the

Table 6. Comparison of quality of life (points, $\bar{x}\pm s$)

Index	Observation group (n=75)				Control group (n=63)			
	Before intervention	After intervention	t	P	Before intervention	After intervention	t	P
Body function	75.69±4.28	88.37±4.12*	16.941	<0.001	74.58±5.10	84.52±2.97	13.368	<0.001
Emotional function	79.56±4.83	89.47±4.06*	12.466	<0.001	78.69±4.57	85.63±3.10	9.975	<0.001
Role function	78.19±3.49	88.59±4.03*	16.895	<0.001	78.95±3.97	83.42±3.72	6.521	<0.001
Cognitive function	79.30±3.75	89.57±5.02*	14.194	<0.001	78.96±4.21	85.63±5.48	7.661	<0.001
Social function	75.68±6.51	88.76±4.59*	14.221	<0.001	76.69±5.69	82.48±6.42	5.357	<0.001
Nausea vomiting	73.29±6.11	61.45±5.89*	12.082	<0.001	72.95±5.03	67.59±4.27	6.448	<0.001
Pain	71.95±5.98	62.46±3.96*	11.459	<0.001	72.79±6.44	68.74±4.08	4.217	<0.001
Fatigue	73.40±5.21	61.09±4.92*	14.877	<0.001	72.99±6.30	67.95±5.28	4.867	<0.001

Note: Compare with control group, *$P<0.05$.

Table 7. Comparison of urodynamic parameters ($\bar{x}\pm s$)

Index	Observation group (n=75)				Control group (n=63)			
	Before intervention	After intervention	t	P	Before intervention	After intervention	t	P
Maximum urine flow (kPa)	23.48±3.52	31.58±2.97*	15.231	<0.001	24.10±3.16	28.41±3.01	7.839	<0.001
Maximum urethral closure (mL/s)	12.96±1.46	16.83±1.52*	15.902	<0.001	13.04±1.73	15.97±1.66	9.700	<0.001
Maximum bladder capacity (ml)	329.58±25.68	408.82±31.28*	16.956	<0.001	331.83±27.52	379.65±30.26	9.280	<0.001

Note: Compare with control group, *$P<0.05$.

Table 8. Comparison of nursing satisfaction [n (%)]

Group	Number of cases	Very satisfied	Satisfied	Dissatisfied	Satisfaction degree (%)
Observation group	75	59 (78.67)	14 (18.67)	2 (2.67)	97.33
Control group	63	35 (55.55)	19 (30.16)	9 (14.29)	85.71
Z	-	-	-	-	-3.081
P	-	-	-	-	0.002

symptom dimension scores decrease ($P<0.05$). Specifically, the observation group had higher functional dimension scores in quality of life assessment and lower symptom dimension scores than the control group after intervention ($P<0.05$), as shown in **Table 6**.

Comparison of urodynamic parameters between the two groups

Before the intervention, there were no significant differences in maximal urine flow, maximal urethral closure pressure, or maximal bladder capacity between the two groups (all $P>0.05$). Post-intervention, both groups showed significant improvements in these urodynamic parameters (all $P<0.05$). The observation group had apparently superior post-intervention indicators than the control group ($P<0.05$) (**Table 7**).

Comparison of nursing satisfaction between the two group

In terms of satisfaction with nursing work, 59 patients were very satisfied (78.67%), 14 were satisfied (18.67%), and 2 were dissatisfied (2.67%) in the observation group, with a satisfaction rate of 97.33%. In the control group, 35 patients were very satisfied (55.55%), 19 were satisfied (30.16%), and 9 were dissatisfied (14.29%), with a nursing satisfaction rate of 85.71%. The observation group showed significantly higher satisfaction with nursing care compared to the control group ($P<0.05$), as shown in **Table 8**.

Discussion

Radical prostatectomy is currently an important way to treat prostate cancer. It can effec-

tively remove the tumor lesions, prolonging patient survival and improve clinical outcomes [12]. However, radical prostatectomy can also negatively impact the urinary system, causing complications such as urinary incontinence and retention, which increase psychological stress and diminish the quality of life [13]. Clinical studies have shown that radical prostatectomy places enormous psychological burden on patients, leading to negative psychological affections of inferiority, anxiety, and depression. In addition, urinary function decline after operation may influence normal life of patients and further aggravate their anxiety [14-16]. Evidence-guided nursing is a new caring mode that integrates evidence-based medicine principles [17]. This approach combines professional nursing skills, scientific research, and patient needs, to guide nursing decision-making with precision and objectively allows for the development of tailored care plans [18-20]. This research shows that evidence-based nursing enables the development of well-founded and reasonable care programs that are aligned with the latest scientific findings and the practical conditions of both nurses and patients [21, 22]. Meanwhile, using the most up-to-date scientific evidence as the basis for clinical nursing decisions allows for the delivery of higher-quality care to patients [23-25].

Our hospital put forward a model of evidence-based collaborative nursing, aiming to improve the negative emotion and life quality of those with prostate cancer after operation. According to research results, the observation group had lower negative emotional scores and higher positive emotional scores post-intervention compared to the control group. This indicates that the evidence-based collaborative nursing model can effectively reduce patients' negative emotions after operation and encourage a more positive attitude toward disease [26]. Collaborative nursing models engage patients and their families, encouraging active participation in the care process. In addition, integrating evidence-based medicine with collaborative nursing enhances the scientific rigor of nursing practices [27, 28]. The fear of disease progression across all dimensions was significantly lower in the observation group than in the control group after the intervention. Under the collaborative caring mode based on evidence-guided medicine, patients and their families can better understand the importance of active nursing, which in turn promotes a proactive approach to disease management and reduces fears about disease progression. Postoperative complications were fewer, and urodynamic improvements were more pronounced in the observation group compared to the control group. The active involvement of patients in the postoperative rehabilitation process, along with improved understanding of their condition and higher treatment compliance, contributed to better recovery outcomes, improved urinary flow dynamics, and a reduction in postoperative complications. These findings align with those reported in similar studies [29-31]. Furthermore, the observation group exhibited a significantly better post-intervention quality of life and greater satisfaction with nursing care than the control group. This suggests that the evidence-based collaborative nursing model not only improves psychological well-being and reduces fear of disease progression but also enhances postoperative urodynamic outcomes and reduces complications. As a result, it leads to improved patient satisfaction and overall quality of life [32-35].

Overall, due to the small sample size included in this study and the lack of prospective research analysis, there may be certain deviations in the research results. In future research, we plan to expand the sample size and enhance the nursing interventions to provide higher-quality nursing services for patients undergoing radical prostatectomy. In summary, evidence-guided collaborative caring can effectively reduce negative emotions after radical prostate cancer surgery, improve patients' self-care ability and quality of life, and diminish postoperative complications, which is worthy of clinical promotion.

Disclosure of conflict of interest

None.

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