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The Clinical Application Value of Bundled Nursing Care in Postoperative Recovery of Lung Cancer Patients

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Abstract: *Objective:* To investigate the clinical application value of bundled nursing care in postoperative recovery of lung cancer patients. *Methods:* Eighty lung cancer patients who underwent surgical treatment from October 2022 to May 2024 were selected as the study subjects. Their clinical data were retrospectively analyzed and grouped by nursing methods. The bundled nursing care group (n = 40) received bundled nursing care, while the conventional nursing care group (n = 40) received routine nursing care. Lung function, immune function, complication rate, pain level, exercise tolerance, and quality of life were compared between the two groups. *Results:* Before nursing, there were no statistically significant differences in lung function, immune function, pain level, exercise tolerance, and quality of life between the bundled nursing care group and the conventional nursing care group ($P > 0.05$). After nursing, both groups showed improvement in lung function, immune function, pain level, exercise tolerance, and quality of life, but the bundled nursing care group had better results and a lower complication rate, with statistical significance ($P < 0.05$). *Conclusion:* The bundled nursing care has a higher clinical application value in postoperative recovery of lung cancer patients and is worthy of widespread clinical use.

Keywords: Bundled nursing care; Lung cancer; Lung function; Immune function; Pain level; Exercise tolerance

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1. Introduction

Lung cancer is a malignant tumor that severely impairs patients' lung function and has a very high fatality rate [1]. Currently, surgery is the main treatment method for this disease. However, due to patients' inadequate knowledge of the disease and fear of surgery, their compliance with medical advice is poor, affecting the surgical outcome [2]. Therefore, comprehensive intervention is needed to improve patients' compliance and enhance the treatment effect. Relevant reports have clearly pointed out that the bundled nursing care has a high clinical application value in postoperative recovery of lung cancer patients [3]. It can provide patients with systematic nursing services, fully

meet their nursing needs, further control complications, enhance immune and lung functions, and improve patients' quality of life. To verify the application value of bundled nursing care, this study selected 80 lung cancer patients who underwent surgical treatment from October 2022 to May 2024 as the study subjects and analyzed their lung function, immune function, complication rate, pain level, exercise tolerance, and quality of life.

2. Materials and methods

2.1. Materials

Eighty lung cancer patients who underwent surgical treatment between October 2022 and May 2024 were selected as the study subjects. Their clinical data were retrospectively analyzed, and they were grouped based on nursing methods. The bundled nursing care group received bundled nursing care (n = 40), while the conventional nursing care group received routine nursing care (n = 40). The conventional nursing care group consisted of 22 males and 18 females, aged between 47 and 72 years, with a mean age of (56.66 ± 5.17) years. The bundled nursing care group consisted of 23 males and 17 females, aged between 48 and 74 years, with a mean age of (56.88 ± 5.63) years. The basic characteristics of the study subjects were comparable ($P > 0.05$).

(1) Inclusion criteria: The experimental content was approved by the ethics committee; The study subjects met the clinical diagnosis guidelines for lung cancer [4], were confirmed by pathological examination, actively cooperated with the experiment, were over 18 years old, and were aware of the experimental procedures and signed a consent form.

(2) Exclusion criteria: Patients with immune diseases, poor communication [5], confusion, mental abnormalities, organ dysfunction [6], and those who withdrew from the study midway.

2.2. Methods

The conventional nursing care group received routine nursing care. Before surgery, patients were introduced to the attending doctor and hospital environment in detail to reduce their strangeness, and were guided to complete various inspection items and make preparations. At the same time, patients were provided with psychological intervention and health knowledge education to eliminate negative emotions, improve knowledge awareness, and strengthen patients' compliance with medical advice. During surgery, actively cooperate with doctors in various operations and dynamically monitor patients' vital signs. After surgery, patients' surgical incisions were closely observed, and adverse reactions such as pressure ulcers and venous thrombosis were actively prevented, and abnormalities were promptly handled.

The bundled nursing care group received bundled nursing care. Preoperative intervention included providing patients with extensive health knowledge education, including disease pathogenesis, pathogenic factors, surgical procedures, precautions, and possible complications. Animations and short videos were used to mobilize patients' enthusiasm for learning and strengthen their mastery of disease knowledge. At the same time, during the preoperative visit stage, active communication with patients was initiated to accurately evaluate their psychological state. By sharing successful cases and introducing mature medical technology, patients' anxiety and unease were reduced, thereby improving their confidence in treatment.

Intraoperative intervention involved establishing intravenous access for patients, guiding them to maintain a correct and comfortable surgical position, connecting vital sign monitors, instructing patients to wear respiratory masks, performing oxygen inhalation operations, and placing hot water bags on the skin of the surgical area, with the water temperature controlled at about 50°C. Abnormalities such as shortness of breath and coughing were

promptly reported and intervened as indicated. Postoperative intervention involved continuously monitoring patients' vital signs, providing low-flow oxygen inhalation, ensuring warmth, observing incision conditions such as redness, swelling, and bleeding, and paying attention to patients' skin color and urine output. At the same time, pain management was provided to patients. As patients often experience stronger pain 1–2 days after surgery, methods such as watching videos and listening to music were used to distract their attention and reduce pain. If the pain was unbearable, pain medication was administered as prescribed. In addition, patients were guided on proper postoperative eating habits, with a focus on liquid foods within 6 hours after surgery, avoidance of spicy and cold foods, adherence to the principle of eating small, frequent meals, drinking warm water to accelerate metabolism, and engagement in rehabilitation interventions.

Postoperative activity guidance was provided based on the patient's condition. On the day of removing the chest closed drainage tube, patients were instructed to avoid holding their breath, straining to defecate, violent coughing, and strenuous exercise. On the first postoperative day, patients were encouraged to perform bedside activities for 3–5 minutes. On the 2nd and 3rd postoperative days, patients walked for 5–10 minutes three times a day. From the 4th postoperative day until discharge, patients walked for 10–20 minutes once a day and climbed 10 flights of stairs twice a day without resting. Within two weeks of discharge, patients exercised for 10–20 minutes twice a day, and from two weeks to one month, they exercised for 20–30 minutes twice a day. Exercise options included walking, climbing stairs, and hiking. After discharge, to ensure that patients maintained a safe and effective exercise frequency and intensity, they were taught how to monitor their exercise pulse. Follow-up visits were conducted to urge patients to continue their exercise training.

2.3. Observation indicators

(1) Lung function was tested using a spirometer, analyzing forced expiratory volume in one second and forced vital capacity (FEV1, FVC) levels [7].

(2) Immunoglobulin G and immunoglobulin A (IgG, IgA) were determined by immunofluorescence assay, while CD4 and CD8 were measured using enzyme-linked immunosorbent assay [8]

(3) Daily logs were used to analyze the occurrence of complications such as lung infection, atelectasis, high fever, and bleeding

(4) The VAS scoring scale was utilized to evaluate the degree of pain, with higher scores indicating greater pain [9]; the 6-minute walk test was employed to assess exercise tolerance, with longer distances indicating better endurance [10].

(5) The SF-36 scoring scale was used to evaluate social functioning, vitality, physiological functioning, and mental health, with higher scores indicating better quality of life [11].

2.4. Statistical methods

SPSS 26.0 system was applied. Count data were represented by (n, %) and tested using chi-square test; measurement data were expressed as (±s) and tested using t-test. Statistical significance was indicated by $P < 0.05$.

3. Results

3.1. Comparison of lung function indicators between the bundled care group and the conventional care group

Before nursing, there was no statistical difference in lung function indicators between the bundled care group and the

conventional care group ($P > 0.05$). After nursing, the lung function indicators of the bundled care group were higher than those of the conventional care group, showing statistical significance ($P < 0.05$), as seen in **Table 1** below:

Table 1. Comparison of lung function indicators between the bundled care group and the conventional care group ($\bar{x} \pm s$)

Group/Number of Cases	FVC(L)		FEV1(L)	
	Before Nursing	After Nursing	Before Nursing	After Nursing
Bundled care group (n = 40)	1.43 ± 0.27	2.46 ± 0.53	0.77 ± 0.14	1.52 ± 0.51
Conventional care group (n = 40)	1.42 ± 0.28	1.63 ± 0.41	0.73 ± 0.15	1.25 ± 0.25
t	0.466	5.214	0.536	6.845
P	0.427	0.000	0.364	0.000

3.2. Comparison of immune function indicators between the conventional care group and the bundled care group

Before nursing, there was no statistical difference in immune function indicators between the bundled care group and the conventional care group ($P > 0.05$). After nursing, the immune function indicators of the bundled care group were more ideal than those of the conventional care group, showing statistical significance ($P < 0.05$), as seen in the table below:

Table 2. Comparison of immune function indicators between the conventional care group and the bundled care group ($\bar{x} \pm s$)

Group/ Number of Cases	IgA(g/L)		IgM(g/L)		CD^4		CD^8	
	Before Nursing	After Nursing	Before Nursing	After Nursing	Before Nursing	After Nursing	Before Nursing	After Nursing
Bundled care group (*n* = 40)	2.24 ± 0.32	2.52 ± 0.34	1.33 ± 0.36	1.75 ± 0.33	35.25 ± 10.39	42.27 ± 9.23	31.36 ± 3.38	25.47 ± 3.43
Conventional care group (*n* = 40)	2.22 ± 0.44	2.31 ± 0.25	1.31 ± 0.33	1.53 ± 0.25	34.37 ± 10.44	38.56 ± 8.35	32.17 ± 3.39	28.62 ± 3.16
t	0.327	2.563	0.247	3.154	0.135	2.144	0.352	2.454
P	0.842	0.000	0.741	0.000	0.924	0.000	0.805	0.000

3.3. Comparison of complication rates between the conventional care group and the bundled care group

The complication rate in the bundled care group was lower than that in the conventional care group, showing statistical significance ($P < 0.05$), as seen in **Table 3**.

Table 3. Comparison of complication rates between the conventional care group and the bundled care group [cases (%)]

Group/ Number of cases	Pulmonary infection(n)	Atelectasis(n)	High fever(n)	Bleeding(n)	Total incidence [n(%)]
Bundled care group (n = 40)	1	0	1	0	2(5.50)
Conventional care group (n = 40)	4	2	2	1	9(22.50)
X^2					4.984
P					< 0.05

3.4. Comparison of pain level and exercise tolerance between the conventional care group and the bundled care group

Before nursing, there was no statistical difference in pain level and exercise tolerance between the conventional care group and the bundled care group (P > 0.05). After nursing, the pain level in the bundled care group was lower than that in the conventional care group, and the exercise tolerance was stronger than that in the conventional care group, showing statistical significance (P < 0.05), as shown in **Table 4**.

Table 4. Comparison of VAS scores between the conventional care group and the bundled care group ($\bar{x} \pm s$, points)

Group/ Number of cases	VAS Score		Exercise tolerance	
	before nursing	After nursing	Before nursing	After nursing
Bundled care group (n = 40)	8.59 ± 1.73	3.47 ± 0.37	237.49 ± 29.37	420.78 ± 50.95
Conventional Care Group(n=40)	8.92 ± 1.85	5.81 ± 1.66	238.06 ± 28.14	330.28 ± 36.82
t	0.217	6.944	0.428	9.149
P	< 0.05	< 0.05	> 0.05	< 0.05

3.5. Comparison of quality of life scores between the conventional care group and the bundled care group

Before nursing, there was no statistical difference in quality of life scores between the conventional care group and the bundled care group (P > 0.05). After nursing, the quality of life scores in the bundled care group were higher than those in the conventional care group, showing statistical significance (P < 0.05), as seen in **Table 5**.

Table 5. Comparison of quality of life scores between the conventional care group and the bundled care group ($\bar{x}$ ±s, points)

Group/ Number of cases	Social functioning		Vitality		Physiological function		Mental health	
	Before Nursing	After Nursing	Before Nursing	After Nursing	Before Nursing	After Nursing	Before Nursing	After Nursing
Bundled care group (n = 40)	71.66 ± 2.94	91.07 ± 3.39	70.47 ± 1.84	93.47 ± 3.56	70.16 ± 2.45	92.75 ± 2.39	68.27 ± 8.03	93.85 ± 2.27
Conventional care group (n = 40)	71.47 ± 2.66	81.11 ± 5.26	69.48 ± 2.11	81.46 ± 4.16	69.33 ± 3.32	83.22 ± 1.14	67.27 ± 8.33	82.44 ± 3.55
t	0.342	3.407	0.363	3.667	0.235	3.514	0.537	4.106
P	> 0.05	< 0.05	> 0.05	< 0.05	> 0.05	< 0.05	> 0.05	< 0.05

4. Discussion

Lung cancer often presents with no obvious symptoms in its early stages, and as it progresses, symptoms such as chest pain and cough become apparent. As a clinically common malignant tumor, it has a very high mortality rate, necessitating timely and effective treatment to prolong lifespan. Among diversified treatment options, surgical treatment stands out due to its effectiveness. However, it has a certain degree of invasiveness, and coupled with the poor physical condition of patients, it can easily lead to various postoperative complications. Effective intervention is required to improve patients' physical functions and enhance their quality of life [12].

The results of this study indicate that before nursing, there was no statistical difference in lung function indicators between the bundled care group and the conventional care group ($P > 0.05$). After nursing, the lung function indicators of the bundled care group were higher than those of the conventional care group, showing statistical significance ($P < 0.05$). Similarly, before nursing, there was no statistical difference in immune function indicators between the two groups ($P > 0.05$). After nursing, the immune function indicators of the bundled care group were more ideal than those of the conventional care group, demonstrating statistical significance ($P < 0.05$). The bundled care group also had a lower complication rate compared to the conventional care group, with statistical significance ($P < 0.05$).

Furthermore, before nursing, there was no significant difference in pain level and exercise tolerance between the two groups ($P > 0.05$). However, after nursing, the bundled care group had a lower pain level and stronger exercise tolerance than the conventional care group, exhibiting statistical significance ($P < 0.05$). Additionally, before nursing, there was no statistical difference in quality of life scores between the two groups ($P > 0.05$). After nursing, the bundled care group had higher quality of life scores than the conventional care group, indicating statistical significance ($P < 0.05$).

The reasons for these findings can be attributed to the preoperative psychological nursing and health education, which not only alleviate patients' negative emotions but also improve their knowledge level, strengthening their compliance with medical advice. This ensures the smooth implementation of surgery, avoids stress reactions, and consequently reduces postoperative complications and pain levels. Simultaneously, intraoperative nursing prevents patients from experiencing hypothermia and adverse reactions, enhancing their comfort and facilitating the successful completion of surgery. Furthermore, postoperative pain management, dietary nursing, and rehabilitation care effectively reduce patients' pain, improve bodily nutrition, boost immunity, and promote early recovery. These results fully demonstrate the clinical application value of the bundled nursing care program for postoperative recovery of lung cancer patients, and also validate the value of conducting this experiment.

5. Conclusion

In summary, the bundled nursing care program has a more significant clinical application value for postoperative recovery of lung cancer patients. It is beneficial for strengthening patients' lung function and immune function, reducing postoperative complications, and further improving their exercise tolerance and quality of life. Therefore, it should be widely applied in clinical practice.

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Disclosure statement

The authors declare no conflict of interest.

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