International Journal of General Practice Nursing, 2025, Volume 3, Issue 2
https://ojs.bbwpublisher.com/index.php/IJGPN
ISSN Online: 2981-9423
ISSN Print: 2981-9415

Research on the Effectiveness of High-Quality Nursing in the Treatment of Pleural Effusion with Closed Thoracic Drainage

Cuifang Liu*

Department of Thoracic Surgery, Affiliated Hospital of Hebei University, Baoding 071000, Hebei, China

**Author to whom correspondence should be addressed.*

Abstract: *Objective*: To explore the effectiveness of high-quality nursing applied to the treatment of pleural effusion with closed thoracic drainage. *Methods*: From March 2024, the hospital began to collect case data on the treatment of pleural effusion with closed thoracic drainage. By March 2025, a total of 72 cases were included and randomly grouped using a computer system. One group of 36 cases received routine nursing as the reference group, and another group of 36 cases received high-quality nursing as the experimental group. The drainage volume, complications, and nursing satisfaction were compared between the two groups. *Results*: The daily drainage volume, drainage time, and hospital stay in the experimental group were significantly lower than those in the reference group ($P < 0.05$). The incidence of complications in the experimental group was 11.11%, which was significantly lower than 27.78% in the reference group ($P < 0.05$). The nursing satisfaction in the experimental group was 94.44%, which was significantly higher than 66.67% in the reference group ($P < 0.05$). *Conclusion*: The application of high-quality nursing in the treatment of pleural effusion with closed thoracic drainage can significantly reduce drainage time and volume, with fewer complications and higher overall nursing satisfaction. It can be further promoted in nursing practice.

Keywords: High-quality nursing; Closed thoracic drainage; Pleural effusion

Online publication: June 6, 2025

1. Introduction

Pleural effusion is mainly characterized by the accumulation of a large amount of pathological fluid in the pleural cavity. This fluid accumulation can compress the normal space between the lungs and the chest wall, leading to a series of symptoms such as dyspnea, chest tightness, cough, and possible chest pain [1]. Currently, closed thoracic drainage is a commonly used method to treat pleural effusion in clinical practice. By inserting a thin tube into the chest wall, the fluid in the pleural cavity is drained out, thereby reducing the compression on the lungs and improving the patient's respiratory status [2]. Closed thoracic drainage has the advantages of relatively small

trauma, simple operation, and low risk of infection due to being performed in a closed environment, making it a highly safe procedure. During the treatment process, it is necessary to combine high-quality nursing interventions to effectively relieve patients' symptoms, reduce the occurrence of complications, and promote patients' quick recovery. This study conducted a comparative analysis of 72 patients with pleural effusion who underwent closed thoracic drainage treatment in the hospital in the past year to further understand the effectiveness of high-quality nursing. The details are as follows.

2. Materials and methods

2.1. General information

From March 2024, the hospital began collecting case data on the treatment of pleural effusion with closed thoracic drainage. By March 2025, a total of 72 cases were included and randomly grouped using a computer system. Among the 36 cases in the experimental group, there were 20 males and 16 females, with an age range of 35–67 years and a mean age of 51.74 ± 0.29 years. Among the 36 cases in the reference group, there were 19 males and 17 females, with an age range of 34–66 years and a mean age of 51.56 ± 0.38 years. Comparing the general information between the two groups showed strong comparability ($P > 0.05$).

2.2. Methods

The reference group received routine nursing care with specific measures [3]: Assisting doctors in performing precise puncture and securely placing the drainage tube, cleverly fixing it with a pin to ensure stability and prevent it from falling off. Continuously and carefully monitoring the patient's condition and drainage status, and promptly handling any abnormalities detected.

The experimental group received high-quality nursing care with the following specific measures: (1) High-quality nursing before puncture. Provide patients with a detailed introduction to the treatment process and disease-related knowledge to ensure they fully understand their condition and treatment. Offer necessary psychological support, listen, encourage, and provide positive information to help patients cope with emotional issues and enhance their confidence in overcoming the disease [4]. Additionally, nursing staff should guide patients to avoid violent coughing. If it is difficult to suppress, cough suppressants can be appropriately used to alleviate symptoms. (2) High-quality nursing during puncture. When performing the puncture, it is essential to ensure that the patient's body parts are appropriately exposed. Medical staff should adjust the indoor environment to maintain optimal humidity and temperature, minimizing the risk of discomfort or colds due to exposed skin. Patients should be guided to adopt a proper puncture position, avoid coughing or making large movements that could deviate the puncture needle from its intended location. Closely monitor the patient's reaction during the puncture. If abnormal symptoms such as paleness, chest pain, or palpitations occur, which may indicate an allergic reaction or other serious complications, the puncture should be immediately stopped, and emergency measures should be taken promptly [5]. (3) High-quality nursing after puncture. After the puncture, the patient's vital signs still need to be closely monitored. The initial drainage volume of pleural effusion should be controlled below 1000 milliliters to prevent complications such as re-expansion pulmonary edema or mediastinal swing caused by rapid fluid drainage. The subsequent daily drainage volume should be maintained between 1000 and 2000 milliliters. Meanwhile, the nature and color of the drained fluid should be carefully observed. The drainage speed should be moderately controlled to prevent complications such as re-expansion pulmonary edema or mediastinal swing

due to excessive drainage speed [6]. During the drainage process, patients should be kept in a semi-recumbent position. Medical staff should ensure that the drainage tube is unobstructed without twists, bends, or breaks, as these conditions could hinder normal fluid drainage or even cause drainage failure. When patients are active, the drainage tube should always be kept below the puncture site to prevent fluid backflow. If the drainage tube is higher than the puncture site, fluid may flow back into the chest cavity, increasing the risk of retrograde infection. (4) Nursing care for preventing complications. Common complications during intravenous catheter drainage treatment for pleural effusion patients include catheter blockage, catheter slipping, and infection. In this treatment and nursing stage, nursing staff should dynamically monitor the patency of the drainage tube and regularly squeeze the closed thoracic drainage tube to prevent blockage. In case of tube blockage, a 20-milliliter 0.9% sodium chloride solution should be immediately used for pulsed flushing of the catheter, and the doctor should be informed promptly for treatment. Attention should be paid to precisely controlling the flushing force and speed to ensure effective removal of blockages inside the catheter while avoiding unnecessary pain or injury to the patient [7]. Additionally, nursing staff should closely monitor the puncture site, regularly check the catheter's fixing belt and dressing to ensure stable fixation, and promptly take measures to address any catheter detachment. The puncture site and surrounding skin should always be kept clean and dry, and disinfection should be performed every two days to ensure the puncture site remains sterile and prevent drainage fluid from flowing backward. Effective treatment must be provided to patients who have developed infections. (5) Nutritional support. Maintain a nutritious diet, ensuring that food contains high calories to quickly provide energy and help patients maintain normal physiological functions and enhance physical strength. High-protein foods are essential as protein is crucial for repairing damaged tissue and maintaining muscle mass. Ensure adequate vitamin intake to strengthen the patient's immune system and promote wound healing. Avoid stimulating foods that may irritate the digestive system, causing discomfort or pain. Additionally, control salt intake as excessive salt can lead to hypertension and other health issues. Ensure patients receive the most suitable nutritional support for their recovery.

2.3. Observation of indicators

Observation of indicators: Observe and record the daily drainage volume, drainage time, length of hospital stay, and other indicator levels for both groups of patients. Complications: Observe and document the occurrence of complications such as catheter infection, puncture site leakage, phlebitis, and arrhythmia during the closed thoracic drainage treatment for both groups of patients. Calculate the total incidence rate for statistical analysis. Evaluation of nursing satisfaction: Develop a self-administered nursing satisfaction questionnaire that includes aspects such as nursing service quality, nursing efficiency, and nursing operations. Use the Likert 5-point rating scale for objective evaluation, with a maximum score of 5. A score of 4–5 indicates satisfaction; a score of 2–3 indicates general satisfaction; and a score of 1 indicates dissatisfaction. The total satisfaction rate is calculated as 100% minus the dissatisfaction rate.

2.4. Statistical Analysis

Analyze the recorded data using SPSS 25.0 statistical software. Express measurement data such as drainage volume as (±s) and perform a *t*-test. Represent count data such as incidence rate as [n(%)] and conduct an x^2 test. The study is considered meaningful when the statistical analysis yields $P < 0.05$.

3. Results

3.1. Comparison of clinical indicators

The experimental group showed significantly lower levels of daily drainage volume, drainage time, and length of hospital stay compared to the reference group ($P < 0.05$), as shown in **Table 1**.

Table 1. Comparative analysis of relevant clinical indicator levels between the two groups (Mean ± SD)

Group	Number of cases	Daily drainage volume (ml)	Drainage time (d)	Hospital stay (d)
Reference group	36	950.52 ± 27.73	9.87 ± 1.26	13.47 ± 1.36
Experimental group	36	715.44 ± 25.26	6.02 ± 1.15	8.84 ± 1.51
t	-	27.3916	6.6149	7.4315
P	-	<0.05	<0.05	<0.05

3.2. Complications

The incidence of complications in the experimental group was significantly lower at 11.11% compared to 27.78% in the reference group ($P < 0.05$), as shown in **Table 2**.

Table 2. Comparative analysis of complications between the two groups [n(%)]

Group	Number of cases	Catheter infection	Puncture site leakage	Phlebitis	Arrhythmia	Total incidence rate
Reference group	36	2 (5.56%)	2 (5.56%)	3 (8.33%)	3 (8.33%)	10 (27.78%)
Experimental group	36	1 (2.78%)	1 (2.78%)	1 (2.78%)	1 (2.78%)	4 (11.11%)
x^2	-					11.1358
P	-					<0.05

3.3. Comparison of nursing satisfaction

The nursing satisfaction in the experimental group was significantly higher at 94.44% compared to 66.67% in the reference group ($P < 0.05$), as shown in **Table 3**.

Table 3. Comparative analysis of nursing satisfaction evaluation between the two groups [n(%)]

Group	Number of cases	Satisfied	Generally satisfied	Dissatisfied	Overall satisfaction rate
Reference group	36	14 (38.89%)	10 (27.78%)	12 (33.33%)	24 (66.67%)
Experimental group	36	19 (52.78%)	15 (41.67%)	2 (5.56%)	34 (94.44%)
x^2	-				19.4786
P	-				<0.05

4. Discussion

Pleural effusion, a common clinical abdominal condition, can progressively worsen without prompt and effective treatment, potentially leading to severe complications that threaten patients' quality of life and overall health. The treatment of pleural effusion typically involves the scientific drainage of fluid from the body, with closed thoracic drainage being a widely adopted therapeutic approach that effectively reduces chest compression in patients.

However, without adequate nursing intervention during the drainage process, there exists a risk of complications that may adversely affect the drainage outcome. Therefore, it is imperative to strictly implement nursing interventions for patients undergoing drainage to ensure treatment efficacy, promote early recovery, and ultimately enhance their quality of life.

Traditional nursing intervention models often fail to provide precise care tailored to individual differences when managing patients undergoing drainage treatment for pleural effusion, resulting in suboptimal nursing outcomes that negatively impact patient recovery and prognosis [8]. Conversely, high-quality nursing services, grounded in the patient-centered philosophy, significantly enhance nursing standardization and professionalism by optimizing care processes. This approach better meets the specific needs of patients and ensures the smooth progression of closed thoracic drainage. Such nursing strategies comprehensively cover all aspects of closed drainage, effectively reducing the risks associated with puncture and minimizing the damage caused to patients' bodies. In the later stages of treatment, high-quality nursing also emphasizes the prevention of complications through strengthened measures such as monitoring drainage tubes, securing catheters, and maintaining skin cleanliness, thereby effectively reducing the occurrence of adverse events like infection, tube dislocation, and bleeding, and enhancing the overall safety of closed thoracic drainage [9]. Furthermore, this nursing model pays close attention to adjusting patients' dietary and nutritional intake plans, avoiding irritation of wounds and gastrointestinal function caused by unsuitable foods, ensuring good nutritional status during drainage, and preventing nutritional deficiencies, ultimately promoting early patient recovery.

The results of this study indicate that the experimental group had significantly lower levels of daily drainage volume, drainage time, hospital stay, and complication rates compared to the reference group. Additionally, the nursing satisfaction rate in the experimental group was significantly higher at 94.44% compared to 66.67% in the reference group. Analysis suggests that the high-quality nursing intervention strategy particularly emphasizes meticulous care before, during, and after patient treatment. The nursing phase prior to closed drainage therapy focuses on psychological care, health education, and adequate preoperative preparation, aiming to alleviate patients' negative emotions, enhance their disease knowledge, and ensure smooth treatment execution through comprehensive surgical readiness. During treatment, rigorous monitoring of vital signs such as blood pressure, respiration, and heart rate is performed, and patients are assisted in adopting appropriate positions to guarantee effective drainage and minimize the risk of complications. Any abnormal patient conditions are promptly reported to physicians for swift management, ensuring patient safety. Post-treatment nursing efforts concentrate on various aspects, including drainage management, position adjustment, and health guidance, with drainage care being particularly critical. During this process, the wound height is adjusted based on the specific length of the drainage tube, minimizing tension and preventing tube twisting or dislodging, thereby ensuring unobstructed drainage, facilitating smooth fluid removal, reducing drainage and hospital stay durations, lowering complication rates, and supporting patients' healthy recovery [10].

5. Conclusion

In conclusion, the application of high-quality nursing in the treatment of pleural effusion with closed thoracic drainage can significantly reduce drainage time and volume, decrease complications, and increase overall nursing satisfaction. This approach can be further promoted in nursing practice.

Funding

Science and Technology Support Program of Baoding City, Hebei Province (Project No: 2241ZF326)

Disclosure statement

The author declares no conflict of interest.

References

[1] Sun Y, 2020, Application Value of High-quality Nursing Intervention in the Treatment of Pleural Effusion with Closed Thoracic Drainage. Journal of Clinical Medical Literature (Electronic Edition), 7(6): 129–130.

[2] Zhou J, Guan X, Han J, 2020, Evaluation of the Clinical Efficacy and Application Effect of Nursing Intervention in the Treatment of Pleural Effusion with Closed Thoracic Drainage. Psychology Monthly, 15(2): 17–19.

[3] Xu CL, Deng M, Zhang JM, et al., 2020, Application Effect of High-quality Nursing Intervention in the Treatment of Rib Fractures with Pneumothorax using Closed Thoracic Drainage. Clinical Research and Practice, 5(5): 18–19.

[4] Fu LD, 2021, Application Value of High-quality Nursing Intervention Model in Patients with Rib Fractures and Hemopneumothorax Treated with Closed Thoracic Drainage. Guide of China Medicine, 19(2): 187–188.

[5] Wang JH, 2019, Application Value of High-quality Nursing Intervention in the Treatment of Pleural Effusion with Closed Thoracic Drainage. World Latest Medicine Information (Electronic Edition), 19(29): 296–298.

[6] Tian D, 2022, Observing the Application Effect of Whole-process High-quality Nursing in Draining Large Amounts of Pleural Effusion. Chinese Journal of Metallurgical Industry Medicine, 35(6): 658.

[7] He QX, Li H, Zhang YF, 2022, Analysis of Nursing Effects of Systematic Nursing in the Treatment of Pleural Effusion with Closed Thoracic Drainage. Journal of Chengde Medical College, 33(6): 496–497.

[8] Tao XY, 2022, Application of Comprehensive Systematic Nursing in Patients with Pleural Effusion Treated by Closed Thoracic Drainage. Chinese Journal of Ethnomedicine and Ethnopharmacy, 23(16): 97.

[9] Zhou JQ, Zhang RZ, 2019, Nursing Effect of Systematic Nursing in the Treatment of Pleural Effusion with Closed Thoracic Drainage. Cardiovascular Disease Journal of Integrated Traditional Chinese and Western Medicine (Electronic Edition), 7(18): 145–146.

[10] Deng GZ, 2022, The Influence of Nursing Intervention on the Efficacy of Closed Thoracic Drainage in the Treatment of Pleural Effusion. Journal of Chinese Pharmaceutical Sciences, 23(9): 124–125.