Application and Satisfaction Analysis of Humanized Quality Nursing Intervention in the Care of Patients with Critical Respiratory Failure

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Abstract: *Objective:* To implement humanized quality care in critical respiratory failure nursing, observe the effect, and analyze the satisfaction. *Methods:* 80 patients with severe respiratory failure were divided into 40 cases per group (admitted from February 2022 to December 2023) by double-blind method, the control group performed routine care, and the observation group was given humanized quality care. *Results:* After the nursing care, two respiratory function indexes of the observation group were lower than those of the control group, and two pulmonary function indexes were higher than those of the control group ($P < 0.05$); regarding the complication situation, the incidence rate of the observation group was lower ($P < 0.05$); regarding the nursing care satisfaction situation, the observation group had a higher level of total satisfaction ($P < 0.05$). *Conclusion:* The application of a humanized quality nursing intervention model in the care of critical respiratory failure can actively improve patients' respiratory status and lung function, reduce complications, and satisfy patients.

Keywords: Critical respiratory failure; Humanized quality nursing; Nursing satisfaction

1. Introduction

Respiratory failure is a critical clinical condition that requires mechanical ventilation therapy to improve respiratory status and ensure normal body function. However, the treatment cycle is relatively long. During the early stages of treatment, patients need to remain immobile, which can lead to ventilator-associated pneumonia and reduced joint and muscle activity, potentially causing muscle atrophy [1]. These complications hinder overall recovery, making it essential to strengthen nursing cooperation. Humanized quality care, which emphasizes patient-centeredness, provides comprehensive, systematic, and targeted nursing responses aimed at promoting early recovery. This study investigates the effects of humanized quality care on patients with severe respiratory failure and analyzes patient satisfaction, with a total of 80 patients being selected.

2. Materials and methods

2.1. General information

Eighty patients with severe respiratory failure were selected, admitted to the hospital from February 2022 to December 2023, and grouped using the double-blind method, resulting in two groups of 40 patients each.

    (1) Control group: 24 male patients and 16 female patients, aged 32–70 years (mean age 57.45 ± 10.13 years).

    (2) Observation group: 23 male patients and 17 female patients, aged 30-71 years (mean age 57.56 ± 10.24 years).

    There were no significant differences in the demographic information between the two groups ($P > 0.05$).

2.2. Inclusion and exclusion criteria

    (1) Inclusion criteria: (a) Meeting the clinical diagnostic criteria for severe respiratory failure and requiring pharmacological or mechanical ventilation therapeutic intervention; (b) Stable vital signs; (c) Good tolerance with normal visual, auditory, and speech abilities; (d) Complete clinical information.

    (2) Exclusion criteria: (a) Severe myocardial infarction; (b) Bronchodilatation, bronchial asthma, pulmonary tuberculosis, or other related diseases; (c) Functional disorders of the immune system; (d) Presence of infectious diseases; (e) Death during the study period.

2.3. Methods

2.3.1. Control group: routine nursing

Patients received routine nursing care, which included:

    (1) Continuously monitor changes in vital signs;

    (2) Regularly detect and record data such as blood pressure, heart rate, and pulse;

    (3) Administering medications as prescribed;

    (4) Maintaining a therapeutic environment and adhering to aseptic operation principles;

    (5) Allowing visits according to hospital rules and regulations;

    (6) Patiently answering questions from patients and their families.

2.3.2. Observation group: humanized quality nursing

Patients received humanized quality nursing care, which included:

    (1) Psychological care: (a) Engage in frequent communication with the patients, using easy topics for benign stimulation; (b) Alleviate anxiety and fear through physical interactions such as shaking hands, stroking the head, and patting the back; (c) Inform patients about their condition changes and cite successful cases to boost their confidence; (d) If the patient's condition permits, play soothing music and incorporate respiratory training to divert attention and regulate body and mind; (e) Arrange family visits per rules and explain the precautions to be taken. Encourage family members to share positive stories to enhance the patient's desire for survival.

    (2) Oxygen therapy care: (a) Set the oxygen flow rate according to the doctor's instructions, and determine the time and method of oxygen administration; (b) Standardize oxygen therapy, ensuring oxygen is humidified and the oxygen-absorbing device is properly fixed; (c) For unconscious patients, assess oxygen therapy effectiveness through arterial blood gas analysis; for conscious patients, monitor heart rate and respiratory status.

    (3) Respiratory tract care: (a) Regularly inspect and check the respiratory tract; (b) Assess sputum expectoration ability and assist with sputum expulsion by back tapping as needed; (c) Observe respiratory status and use a fiberoptic bronchoscope for suctioning secretions if sputum expulsion is

difficult; (d) Promote sputum expulsion with medication and instrumentation.

(4) Activity Nursing: (a) After the patient regains consciousness, elevate the head of the bed to about 65° and assist with upper limb joint activities; (b) Provide muscle massage to relax the limbs, assess limb function and muscle status every 24 hours, and adjust the activity program every two days; (c) Ensure activity safety by equipping first-aid items and using a ventilator as needed.

(5) Dietary care: (a) For patients who can eat by mouth, provide light and easily digestible food with high fiber and protein content; (b) Control calorie intake to prevent high blood sugar, offer small and regular meals and supplement dietary fiber; (c) Encourage the consumption of fresh fruits and vegetables, and advise against strong stimulating foods like coffee and pastries.

(6) Skin care: (a) Ensure bed sheets and bedding are clean and comfortable, and replace disposable urinary pads promptly; (b) Adjust the mask tightness for patients receiving oxygen via mask to reduce facial skin pressure; (c) Use anti-pressure sore dressings reasonably and replace contaminated bedding and clothing in time.

(7) Pulmonary rehabilitation care: (a) During the patient's awake time, train their ability to cough up sputum effectively, and perform abdominal and lip-contraction breathing exercises; (b) For abdominal breathing training, the patient should lie down with hands placed naturally on the abdomino-thoracic area. Instruct them to inhale through the nose, causing the abdomen to bulge, then contract the diaphragm and exhale slowly while controlling the breathing frequency to 7–8 times per minute; (c) For lip-contraction breathing, the patient should inhale naturally and exhale slowly through narrowed lips to facilitate gas exchange, maintaining an inhalation-to-exhalation ratio of 1:2 or 1:3. Conduct training three times a day for 10–20 minutes each session, depending on the patient's condition.

2.4. Observation indicators

(1) Respiratory function indexes: Includes peak airway pressure and mean airway pressure.

(2) Lung function indicators: Includes the first second expiratory volume (FEV1) and exertion lung volume.

(3) Statistical complications: Includes pressure ulcers, pulmonary heart disease, and ventilator-associated pneumonia.

(4) Nursing satisfaction: Measured using the hospital's own nursing satisfaction questionnaire. Survey results were categorized into very satisfied, generally satisfied, and less satisfied. Total satisfaction was calculated as the sum of the very satisfied rate and the generally satisfied rate.

2.5. Statistical methods

Data were analyzed using SPSS version 25.0 statistical software. Measurement data conforming to a normal distribution were expressed as mean ± standard deviation (SD) and analyzed using the *t*-test. Count data were expressed as frequencies [n (%)] and analyzed using the χ^2 test. A *P*-value of less than 0.05 was considered statistically significant.

3. Results

3.1. Respiratory function index

Table 1 shows that there was no significant difference between the respiratory function indexes of the two groups before nursing ($P > 0.05$), but the peak airway pressure and mean airway pressure of the observation group were significantly lower than that of the control group after nursing ($P < 0.05$).

Table 1. Respiratory function indexes (mean ± SD, cmH$_2$O)

Group	Cases (n)	Peak airway pressure		Mean airway pressure	
		Pre-nursing	Post-nursing	Pre-nursing	Post-nursing
Control group	40	19.40 ± 2.37	15.84 ± 2.13	14.30 ± 2.15	12.03 ± 2.14
Observation group	40	19.36 ± 2.24	12.22 ± 2.05	14.18 ± 2.31	9.57 ± 1.18
t	-	0.078	7.745	0.240	6.367
P	-	0.938	0.000	0.811	0.000

3.2. Lung function indexes

As shown in **Table 2**, the difference between the lung function indexes of the two groups before nursing is not significant ($P > 0.05$). However, after nursing, the observation group exhibited significantly higher first second expiratory volume and exertion lung volume as compared to the control group ($P < 0.05$).

Table 2. Pulmonary function indexes (mean ± SD, L)

Group	Cases (n)	First second expiratory volume		Exertion lung volume	
		Pre-nursing	Post-nursing	Pre-nursing	Post-nursing
Control group	40	1.18 ± 0.13	1.50 ± 0.11	1.97 ± 0.20	2.19 ± 0.12
Observation group	40	1.20 ± 0.17	1.63 ± 0.15	1.95 ± 0.13	2.56 ± 0.14
t	-	0.591	4.420	0.530	12.691
P	-	0.556	0.000	0.597	0.000

3.3. Complications

The observation group showed a complication rate of 5.00%, which was significantly lower than the 20.00% of the control group ($P < 0.05$; **Table 3**).

Table 3. Complications [n (%)]

Group	Cases (n)	Pressure ulcers	Pulmonary heart disease	Ventilator-associated pneumonia	Total
Control group	40	4 (10.00)	1 (2.50)	3 (7.50)	8 (20.00)
Observation group	40	1 (2.50)	0 (0.00)	1 (2.50)	2 (5.00)
χ^2	-	-	-	-	4.114
P	-	-	-	-	0.043

3.4. Nursing care satisfaction

Table 4 shows that the total nursing satisfaction level of the observation group was 100.00%, which was significantly higher than the control group of 82.50% ($P < 0.05$).

Table 4. Nursing care satisfaction [n (%)]

Group	Cases (n)	Very satisfied	Fairly Satisfied	Not very satisfied	Total satisfaction
Control group	40	19 (47.50)	14 (35.00)	7 (17.50)	33 (82.50)
Observation group	40	26 (65.00)	14 (35.00)	0 (0.00)	40 (100.00)
χ^2	-	-	-	-	7.671
P	-	-	-	-	0.006

4. Discussion

Respiratory failure results from a variety of complex factors leading to ventilation dysfunction, manifesting in symptoms such as visible cyanosis and dyspnea. Pneumonia and chronic pulmonary diseases, like chronic obstructive pulmonary disease (COPD), are primary causes of respiratory failure. As the disease progresses, cardiopulmonary function continues to deteriorate, and complications are common, posing significant risks to life [2].

Clinical treatment of severe respiratory failure primarily relies on mechanical ventilation therapy. This therapy improves lung ventilation function and regulates gas retention disorders [3]. However, due to the lengthy treatment period and other factors, overall patient recovery is often poor, necessitating scientific nursing interventions.

Conventional nursing practices are simple and lack diversity, resulting in suboptimal outcomes. Humanized quality care represents a new nursing model that integrates the benefits of humanized and quality nursing methods, enriching the nursing content and emphasizing its importance. This model includes seven key elements:

(1) Psychological care: Regulating the patient's psychological state to improve cooperation and facilitate smooth clinical care.

(2) Oxygen therapy care: Regularly assessing the effectiveness of oxygen therapy and managing oxygen therapy devices to reduce adverse events [4,5].

(3) Respiratory care: Promoting effective sputum discharge to prevent respiratory-related issues like pneumonia and asphyxia.

(4) Activity care: Enhancing limb function to prevent muscle atrophy and reduce the risk of pressure ulcers.

(5) Dietary care: Supplementing nutrition to enhance physical fitness and control pressure ulcer formation rates [6].

(6) Skin care: Preventing skin damage and maintaining hygiene to reduce pressure ulcer incidence.

(7) Pulmonary rehabilitation training: Guiding patients in exercises to enhance pulmonary function.

In this study, 40 patients in the observation group received humanized quality care. The results indicated that after nursing intervention, the respiratory function and pulmonary function indexes of patients in the observation group improved significantly. Additionally, the complication rate was lower compared to the control group, demonstrating the effectiveness of humanized quality care in enhancing patient health and reducing complications.

Humanized quality care emphasizes comprehensive and targeted nursing methods [7], focusing on patient-centered, personalized services. This approach not only monitors the patient's condition but also addresses their psychological, physical, and functional needs [8,9], achieving optimal nursing outcomes. Nursing satisfaction is a key indicator of care quality, influencing patient cooperation and indirectly affecting the nursing outcome [10]. This study showed that the total satisfaction level in the observation group reached 100%, compared to 82.50% in the control group. The higher satisfaction rate is attributed to the emphasis on humanistic care and psychological support, which enhances patient cooperation and results in better intervention outcomes [11].

In conclusion, the condition of patients with severe respiratory failure is variable. Combining clinical treatment with humanized quality care can actively improve respiratory status, enhance lung function, reduce complications, and increase patient satisfaction, making it a valuable approach for promotion.

Disclosure statement

The author declares no conflict of interest.

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