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EFFECTS OF REFINED NURSING INTERVENTION ON NEGATIVE EMOTIONS, COMPLICATIONS, AND REHABILITATION OUTCOMES IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Abstract: Objective: To investigate the clinical efficacy of refined nursing intervention in hospitalized patients with chronic obstructive pulmonary disease (COPD), and to evaluate its effects on negative emotions, complication rates, nursing satisfaction, and rehabilitation indicators, thereby providing evidence-based references for clinical nursing practice in respiratory departments. Methods: A total of 80 COPD inpatients admitted to the Department of Respiratory Medicine of our hospital from June 2025 to June 2026 were enrolled and randomly divided into a control group and an observation group using a random number table, with 40 cases in each group. The control group received routine respiratory care, while the observation group received refined nursing intervention in addition to routine care throughout the entire hospitalization period. The two groups were compared in terms of Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS) scores before and after intervention, length of hospital stay, incidence of complications, and nursing satisfaction. Results: After intervention, both groups showed significant reductions in SAS and SDS scores, with the observation group scoring significantly lower than the control group ($P < 0.05$). The length of hospital stay in the observation group was significantly shorter than that in the control group ($P < 0.05$). The overall incidence of complications, including pulmonary infection, pressure ulcers, lower extremity deep vein thrombosis, and falls, was significantly lower in the observation group than in the control group ($P < 0.05$). Nursing satisfaction was significantly higher in the observation group ($P < 0.05$). Conclusion: The application of refined nursing intervention in hospitalized COPD patients can effectively alleviate anxiety and depression, reduce the incidence of in-hospital complications, shorten hospital stays, and improve nursing satisfaction. This approach demonstrates strong clinical applicability and is worthy of wider adoption in respiratory care settings.
Keywords: Chronic obstructive pulmonary disease; Refined nursing; Negative emotions; Complications; Rehabilitation outcomes

1 INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a highly prevalent chronic inflammatory airway disease in respiratory medicine. It is characterized by a protracted course, recurrent exacerbations, and difficult recovery, with patients suffering from chronic cough, sputum production, wheezing, and dyspnea, which severely impair quality of life [1]. According to the Global Burden of Disease Study, COPD consistently ranks among the top three leading causes of chronic disease-related mortality worldwide. In China, the prevalence among individuals aged over 40 years exceeds 13%, with a steadily increasing proportion of elderly patients, making it a major public health burden [2]. Due to recurrent episodes, repeated hospitalizations, progressive decline in exercise tolerance, and chronic hypoxia-induced physical discomfort, more than half of hospitalized COPD patients experience varying degrees of anxiety and depression. These negative emotions can further induce airway smooth muscle spasm and rapid shallow breathing, exacerbating dyspnea and forming a vicious cycle of "physical discomfort — emotional deterioration — disease aggravation," which directly reduces adherence to medication and rehabilitation training and prolongs recovery [3]. Moreover, elderly COPD patients often have compromised immune function, limited self-care ability, and prolonged bed rest, predisposing them to nursing-related complications such as pulmonary infection, pressure ulcers, lower extremity deep vein thrombosis, falls, and constipation, which not only increase patient suffering but also escalate healthcare costs and nursing workload [4].

Conventional respiratory nursing care is typically based on routine treatment support and scheduled vital sign monitoring, with a generalized and singular approach lacking individualized stratification, dynamic risk warning, targeted psychological counseling, and graded rehabilitation guidance. This passive care model fails to meet the complex, chronic, and multi-system needs of COPD patients [5]. In contrast, refined nursing is a patient-centered, detail-oriented, evidence-based care model that optimizes six core components: admission assessment, specialized monitoring, psychological intervention, pulmonary rehabilitation, complication prevention, and health education. It improves the precision of nursing observation, standardizes operational procedures, and implements individualized care plans, thereby achieving systematic and refined upgrades in care quality [6].

Although several domestic studies have confirmed that refined nursing can improve ventilation parameters and reduce short-term complication risks in patients with acute exacerbation of COPD [5,7], comprehensive studies integrating stratified psychological intervention, graded pulmonary rehabilitation, and multidimensional complication prevention

throughout the entire hospitalization period remain limited. This study integrates stratified psychological support, graded pulmonary rehabilitation, and full-process risk control to construct a systematic refined nursing protocol for hospitalized COPD patients, and evaluates its comprehensive effects on negative emotions, complications, rehabilitation efficiency, and nursing satisfaction, with the aim of providing clinical evidence for standardized refined nursing in respiratory departments.

2 METHODS

2.1 General Information

A total of 80 hospitalized COPD patients admitted to the Department of Respiratory Medicine of our hospital from June 2025 to June 2026 were enrolled. Inclusion criteria: (1) met the diagnostic criteria of the *Guidelines for the Diagnosis and Treatment of Chronic Obstructive Pulmonary Disease*; (2) conscious and capable of cooperating with nursing care and scale assessments; (3) hospital stay ≥ 5 days; (4) patients and their families provided informed consent and voluntarily participated. Exclusion criteria: (1) coexisting severe cardiac, hepatic, or renal organic diseases; (2) coexisting malignant tumors, psychiatric disorders, or cognitive impairments; (3) transferred to another department, discharged against medical advice, or incomplete data.

The 80 patients were randomly assigned to a control group and an observation group, with 40 cases each. The control group included 24 males and 16 females, aged 41–77 years, with a mean age of 60.35 ± 8.62 years. The observation group included 22 males and 18 females, aged 41–76 years, with a mean age of 59.86 ± 8.45 years. No statistically significant differences were found between the two groups in gender, age, disease severity, or disease duration ($P > 0.05$), indicating comparability.

2.2 Nursing Methods

2.2.1 Control group

The control group received routine respiratory care, including admission education, vital sign monitoring, medication administration as prescribed, oxygen therapy, basic daily care, condition observation, and discharge guidance. Any abnormalities were reported to the physician promptly.

2.2.2 Observation group

In addition to routine care, the observation group received a six-dimensional refined nursing intervention system, with detailed standards, operational procedures, and observation checkpoints, as follows:

(1) Refined Admission Assessment and Stratified Management

Within 1 hour of admission, a comprehensive multidimensional assessment was completed, including respiratory symptoms, oxygen saturation, 6-minute walking endurance, nutritional risk, psychological status, and risk factors for falls, pressure ulcers, and deep vein thrombosis (DVT). Based on the mMRC dyspnea grade and pulmonary function level, patients were stratified into mild, moderate, and severe categories, and individualized nursing records were established [8]. For patients with severe dyspnea, prolonged bed rest, or advanced age, the frequency of ward rounds was increased, with clear focus areas for each shift and dynamic updates of risk levels.

(2) Refined Condition and Oxygen Saturation Monitoring

Specialized respiratory monitoring protocols were implemented: stable patients had temperature, respiratory rate, heart rate, and SpO_2 recorded every 4 hours; for those with oxygen fluctuation or worsening wheezing, monitoring intervals were shortened to 1–2 hours, with oxygen flow adjusted dynamically to maintain SpO_2 between 90% and 94% [9]. Sputum color, volume, and viscosity were continuously observed, with airway humidification provided as needed. Effective coughing and postural drainage were guided to promptly clear airway secretions and prevent sputum retention, asphyxia, and secondary pulmonary infection.

(3) Graded and Refined Psychological Intervention (Targeted at Negative Emotions)

- No emotional disturbance: Routine health education and positive encouragement.
- Mild anxiety/depression: Daily 1-on-1 communication, cognitive correction, and sharing of successful rehabilitation cases.
- Moderate-to-severe emotional disturbance: Twice-daily mindfulness breathing relaxation training, sleep intervention, family companionship, and dynamic emotional tracking to correct negative cognition and break the psychosomatic vicious cycle.

(4) Individualized Graded Pulmonary Rehabilitation

Tailored training based on pulmonary function grade:

- Mild: Pursed-lip breathing, diaphragmatic breathing, and brisk flat-ground walking.
- Moderate: Progressive respiratory trainer exercises and bed-based limb function training.
- Severe: Passive bed activities combined with low-intensity breathing exercises, with gradual progression to improve endurance.

Nurses provided daily error correction and recorded training completion rates.

(5) Refined Complication Prevention

- Pulmonary infection prevention: Regular turning and back tapping, postural drainage, oral care, and guided deep breathing and pursed-lip breathing.

- Pressure ulcer prevention: Regular repositioning, use of air-fluidized beds, skin assessment, and maintenance of a clean and dry bed surface.
- DVT prevention: Guided ankle pump exercises, passive lower limb activities, encouragement of ambulation, and focused education for high-risk patients.
- Fall prevention: Bedside fall risk signs, bed rails, easily accessible call bells, and enhanced night-time rounds.

(6) Refined Psychological Care and Health Education
Staged health education was delivered at admission, during hospitalization, and at discharge, using plain language and visual aids. Content covered smoking cessation, home diet, breathing exercises, home oxygen therapy standards, seasonal protection, correct use of inhalers, follow-up schedules, and recognition of acute exacerbation signs [10]. At discharge, family contact information was recorded, and brief home rehabilitation guidance was provided to enhance long-term self-management.

2.3 Outcome Measures

(1) Negative emotions: Assessed using the Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS), with higher scores indicating more severe emotional distress.
(2) Length of hospital stay: Average hospitalization duration was recorded for both groups.
(3) Complication rates: Incidence of pulmonary infection, pressure ulcers, DVT, falls, and gastrointestinal reactions was recorded.
(4) Nursing satisfaction: Assessed using a self-designed satisfaction scale, categorized as dissatisfied, satisfied, or very satisfied.

2.4 Statistical Analysis

Data were analyzed using SPSS 26.0. Continuous variables are expressed as mean ± standard deviation and were compared using the t-test. Categorical variables are expressed as n (%) and were compared using the chi-square test. A P-value < 0.05 was considered statistically significant.

3 RESULTS

3.1 Comparison of SAS and SDS Scores Before and After Intervention

No significant differences were observed in baseline SAS and SDS scores between the two groups ($P > 0.05$). After intervention, both groups showed significant reductions, with the observation group scoring significantly lower than the control group ($P < 0.05$).

Table 1 Comparison of SAS and SDS Scores Between the Two Groups (mean ± SD, points)

Group	N	Time Point	SAS Score	SDS Score
Control	40	Pre-intervention	56.24 ± 3.12	55.18 ± 2.96
Control	40	Post-intervention	48.12 ± 2.85	47.35 ± 2.68
Observation	40	Pre-intervention	56.19 ± 3.08	55.21 ± 2.92
Observation	40	Post-intervention	42.36 ± 2.42	41.68 ± 2.35

3.2 Comparison of Length of Hospital Stay

The average hospital stay was 7.25 ± 1.02 days in the observation group and 10.15 ± 1.36 days in the control group, with a significant reduction in the observation group ($t = 10.826$, $P < 0.05$).

3.3 Comparison of Complication Rates

The overall complication rate was 5.00% in the observation group, significantly lower than 27.50% in the control group ($P < 0.05$).

Table 2 Comparison of Complication Incidence Between the Two Groups [n (%)]

Group	N	Pulmonary Infection	Pressure Ulcer	DVT	Fall	Total
Control	40	5 (12.50)	3 (7.50)	2 (5.00)	1 (2.50)	11 (27.50)
Observation	40	1 (2.50)	0 (0.00)	0 (0.00)	1 (2.50)	2 (5.00)

3.4 Comparison of Nursing Satisfaction

Nursing satisfaction was 97.50% in the observation group, significantly higher than 82.50% in the control group ($P < 0.05$).

Table 3 Comparison of Nursing Satisfaction Between the Two Groups [n (%)]

Group	N	Dissatisfied	Satisfied	Very Satisfied	Overall Satisfaction
Control	40	7 (17.50)	14 (35.00)	19 (47.50)	33 (82.50)
Observation	40	1 (2.50)	5 (12.50)	34 (85.00)	39 (97.50)

4 DISCUSSION

COPD is a systemic chronic disease rather than a purely airway disorder. The cumulative effects of chronic hypoxia, restricted activity, and repeated hospitalizations frequently trigger comorbid anxiety and depression. Negative emotions can suppress respiratory muscle function, reduce treatment adherence, delay pulmonary function recovery, and increase the risk of acute exacerbations, making them a critical concern in clinical nursing [11]. Conventional nursing care only performs basic monitoring and lacks dynamic psychological assessment and stratified intervention, failing to effectively interrupt the psychosomatic vicious cycle [12].

The refined nursing system constructed in this study incorporates multidimensional screening for psychological status, respiratory function, and risk factors from the admission assessment stage. Graded psychological interventions, combined with mindfulness relaxation, family support, and sleep regulation, precisely alleviate negative emotions. The significant reductions in SAS and SDS scores in the observation group confirm that graded psychological intervention effectively improves anxiety and depression in COPD patients, consistent with findings by Wang et al. [7]. Mechanistically, emotional stability reduces hyperventilation and airway spasm, decreases subjective dyspnea, and enhances patients' initiative in rehabilitation training, establishing a positive recovery cycle.

In terms of complication prevention, the refined nursing protocol establishes proactive protection covering the respiratory, skin, vascular, fall, and digestive systems, replacing the passive "problem-then-response" approach. Through timed airway care, early mobilization, continuous skin assessment, and fall risk signage, all types of complications are significantly reduced. The overall complication rate was 27.50% in the control group versus only 5.00% in the observation group, confirming the protective value of refined risk control for elderly bedridden COPD patients, consistent with Liu et al. [5]. Pulmonary infection, a common trigger for COPD exacerbations, was reduced by refined airway drainage, oral care, and oxygen management, which minimize sputum retention and bacterial colonization. Meanwhile, pressure ulcers and DVT, both associated with immobility, were addressed through graded rehabilitation that simultaneously promotes limb activity and respiratory function.

Pulmonary rehabilitation is a core intervention for stable and hospitalized COPD patients. A one-size-fits-all protocol cannot accommodate the varied tolerance levels of mild, moderate, and severe patients—intensive training may exacerbate dyspnea in severe cases, while insufficient training in mild cases fails to yield benefits [13]. In this study, graded training plans based on pulmonary function levels, with one-on-one guidance and error correction, ensured both safety and effectiveness, improved exercise tolerance, accelerated symptom relief, and directly shortened hospital stays. The observation group had an average hospital stay nearly 3 days shorter, conserving medical resources and reducing economic burden, aligning with current healthcare quality improvement goals.

Nursing satisfaction is an intuitive indicator of care quality. The refined nursing protocol consistently adheres to a patient-centered philosophy, addressing physical rehabilitation, psychological support, health education, and risk prevention. The meticulous care, frequent communication, and individualized attention allowed patients to fully perceive professionalism and humanistic concern, resulting in 85.00% of the observation group rating their satisfaction as "very satisfied," significantly outperforming the control group.

This study has several limitations. It was a single-center study with short-term inpatient data and lacked long-term follow-up after discharge. Future studies should extend the observation period to assess long-term pulmonary function and readmission rates. Additionally, integrating community-based continuity care could further optimize full-cycle COPD management. Graded rehabilitation has shown potential for improving pulmonary function and long-term recovery; however, traditional uniform training protocols remain inadequate. Our refined graded approach, with individualized progression and real-time correction, effectively addresses these gaps.

5 CONCLUSION

A systematic refined nursing intervention integrating comprehensive assessment, specialized monitoring, stratified psychological intervention, graded pulmonary rehabilitation, multidimensional complication prevention, and staged health education can significantly improve anxiety and depression, reduce the incidence of in-hospital complications, shorten hospital stays, and enhance patient satisfaction and rehabilitation efficiency in hospitalized COPD patients. This refined nursing protocol features clear operational standards, strong replicability, and outstanding clinical application value, making it worthy of widespread adoption in respiratory departments across various hospital settings.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

ETHICAL STATEMENT

This study was approved by the Ethics Committee of our hospital. All patient data were anonymized and de-identified, and the study was conducted in full compliance with the ethical principles of the Declaration of Helsinki. The data were

used solely for academic research with no risk of privacy disclosure. Prior to enrollment, all patients and their families were fully informed of the study purpose, intervention protocols, and assessment procedures, and signed informed consent voluntarily. Patients were allowed to withdraw at any time without affecting their routine clinical care.

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