ORIGINAL RESEARCH

Refinement of Specialized Nursing Intervention in Elderly Patients with Diabetes Complicated by Pulmonary Infection and the Impact on the Patient's Condition and Prognosis

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ABSTRACT

Objective • Our aim was to analyze the effect of refined specialized nursing intervention in elderly patients with diabetes and concurrent pulmonary infection and the impact on patients' conditions and outcomes.

Methods • Clinical data from 87 elderly patients with type 2 diabetes (T2D) complicated by pulmonary infection treated in Lishui Municipal Central Hospital in China from February 2021 to February 2023 were retrospectively analyzed. All patients conformed to complete inclusion and exclusion criteria. Patients were divided into a control group (n=43) and an observation group (n=44) based on the nursing intervention they received. The control group received routine nursing intervention, while the observation group received refined specialized nursing intervention. The nursing intervention effects, hospitalization duration, disease knowledge acquisition, blood glucose indicators (fasting plasma glucose [FPG], 2-hour postprandial glucose [2hPG]), inflammatory marker indicators (C-reactive protein [CRP], heparin-binding protein [HBP]) levels, comfort levels and nursing satisfaction were compared between the 2 groups.

Results • (1) Nursing intervention effect and hospitalization duration: The observation group showed significantly higher overall intervention effectiveness and notably shorter hospital stays compared with the control group ($P < .05$). (2) Disease knowledge acquisition and blood glucose indicator levels: Before the intervention, there were no significant differences in disease knowledge acquisition, FPG or 2hPG levels between the 2 groups ($P > .05$); after the intervention, the observation group exhibited significantly higher disease knowledge acquisition and lower FPG and 2hPG levels than the control group ($P < .05$). (3) Inflammatory marker indicator levels: Prior to the intervention, there were no significant differences in CRP or HBP levels between the 2 groups ($P > .05$); post-intervention, the observation group showed markedly lower CRP and HBP levels compared with the control group ($P < .05$). (4) Comfort levels: Prior to the intervention, there were no significant differences in physiological, psychological, environmental or social comfort scores between the 2 groups ($P > .05$); after the intervention, the observation group exhibited significantly higher scores in all comfort aspects compared with the control group ($P < .05$). (5) Nursing satisfaction: Nursing satisfaction in the control group was 74.42%, while in the observation group it was 90.91%, indicating significantly higher nursing satisfaction in the observation group ($P < .05$).

Conclusion • Refined specialized nursing intervention significantly improved outcomes in elderly patients with diabetes and concurrent pulmonary infection. Compared with routine nursing intervention, refined specialized nursing intervention remarkably enhanced patient comfort during hospitalization, improved disease knowledge acquisition, rapidly adjusted blood glucose levels and reduced systemic inflammatory response, facilitating better patient recovery. Moreover, it moderately enhanced satisfaction for patients and their families, holding significant implications for promoting harmonious doctor-patient relationships, hence advocating for its clinical dissemination. (*Altern Ther Health Med.* 2024;30(12):511-517).

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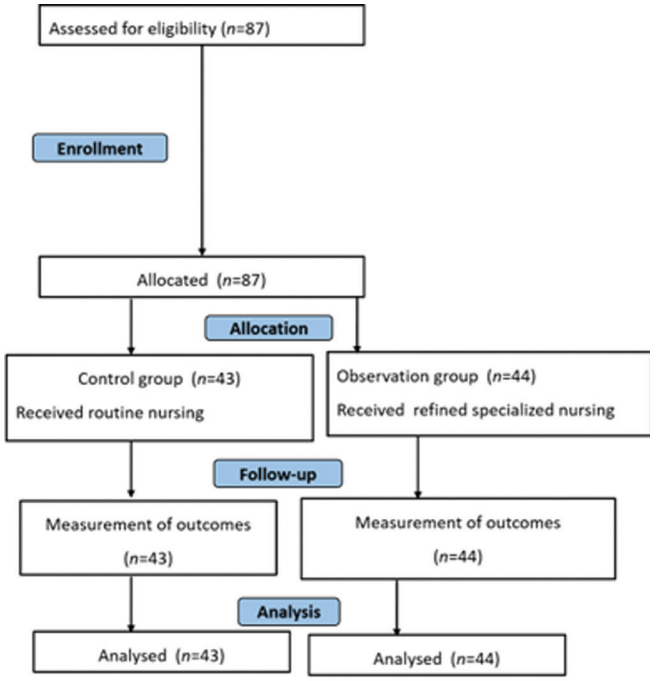
INTRODUCTION

Diabetes in the elderly has gradually emerged as a significant public health concern worldwide—particularly when complicated by pulmonary infection—posing substantial challenges to both healthcare systems and the patients themselves.[1] Statistics indicate that the incidence and mortality rates of pulmonary infection in elderly patients with diabetes are higher than in non-diabetic populations, thus demanding a higher level of care from healthcare providers.[2] The degeneration of the immune system and the instability in glucose metabolism among elderly patients with diabetes render them more susceptible to infections, particularly pulmonary infections. In addition, these patients often present complex conditions with heightened inflammatory responses and compromised immune systems, resulting in greater treatment complexities and prolonged recovery periods.[3] Therefore, personalized and refined care for this specific population demographic is crucial.

While conventional routine care offers fundamental nursing and treatment, it has limitations in meeting the specific needs of elderly patients with diabetes and concurrent pulmonary infection.[4] Hence, the introduction of refined specialized nursing intervention emerged as a robust measure to meet these requirements. Refined nursing emphasizes personalized nursing plans tailored to the patient's specific condition, aiming to enhance the patient's treatment experience and outcomes.[5]

This study retrospectively analyzed clinical data from 87 elderly patients with diabetes with concurrent pulmonary infection admitted to Lishui Municipal Central Hospital in China over the past 2 years. The control group received

Figure 1. Study flowchart.



routine nursing intervention, while the observation group received refined specialized nursing intervention. We meticulously compared multiple performance aspects in both groups to reveal the impact of refined specialized nursing intervention on patients' condition and outcomes. This study focused on nursing intervention effects, hospitalization duration, disease knowledge acquisition, blood glucose indicators, inflammatory marker indicators, comfort levels and nursing satisfaction. Through these multidimensional comparisons, we aimed to comprehensively understand the role of refined specialized nursing intervention in elderly patients with diabetes and concurrent pulmonary infection, and thus provide more substantial evidence for clinical practice. We not only focused on the physiological indicators but also delved into more comprehensive and humanized indicators such as patient comfort and nursing satisfaction.

We believe that improvements in these indicators will not only enhance the patient's treatment experience but also offer beneficial insights for the enhancement and refinement of healthcare systems. Through this research, we aspired to elevate the treatment quality in elderly patients with diabetes and concurrent pulmonary infection, advocate for the broader application of refined nursing models in clinical practice and provide reliable theoretical and practical support.

MATERIALS AND METHODS

Study Participants

Clinical data from 87 elderly patients with diabetes with concurrent pulmonary infection admitted to Lishui Municipal Central Hospital in China between February 2021 and February 2023 were retrospectively analyzed.

Inclusion criteria

All patients (1) were aged ≥60 years; (2) were clinically diagnosed with type 2 diabetes (T2D); (3) presented clear symptoms of pulmonary infection, such as fever, cough, sputum production, dyspnea, along with clinical chest signs like rales or a laboratory-supported diagnosis of pulmonary infection; (4) had complete, authentic clinical data that was available for analysis.

Exclusion criteria

Patients (1) were diagnosed with type 1 diabetes or other special types of diabetes; (2) had autoimmune, neoplastic or cardiovascular disease; organ dysfunction or other related conditions; (3) had systemic acute or chronic infectious diseases; (4) had a history of chronic pulmonary diseases; (5) had mental or consciousness disorders were excluded from the study.

Based on the nursing intervention received, patients were divided into the control group (n=43) and the observation group (n=44). The control group received routine nursing intervention, while the observation group received refined specialized nursing intervention.

The study flowchart is presented in Figure 1.

Methods

Both groups of patients received anti-infective and hypoglycemic treatments upon admission, including oxygen therapy and tracheostomy if needed.

Control group

The control group received routine nursing intervention. After admission, patients received oral and skin care, routine percussion and sputum suction, dietary education, nutritional supplementation and routine monitoring of vital signs including respiration, pulse, blood pressure and heart rate.

Observation group

The observation group received the refined specialized nursing intervention, with specific measures as follows:

Establishment of infection department nursing management quality and service standards. (1) Regular theoretical training sessions for nurses on pulmonary infections, coughing with sputum and specialized diabetes nursing, enhancing their knowledge and skills; (2) Formulation of standardized nursing procedures and regular assessments of nursing staff

Specific measures for specialized nursing intervention include: (1)Disease observation: (a) Rigorously monitor vital signs, with a particular focus on temperature variations. (b) Pay attention to the fever process, types of fever, duration, accompanying symptoms, and adjust temperature measurement intervals based on the patient's specific condition. (2) Cooling measures: (a) Assess the effects of physical or chemical cooling techniques and observe any discomfort experienced by the patient during the cooling process. (3) Oral care guidance and assistance: (a) Provide

guidance and assistance to patients in performing gargling before meals, after meals, in the morning, and before sleep. (b) Administer relevant oral care procedures as needed. (4) Management of perspiration: (a) Promptly wipe down heavily perspiring patients with warm water. (b) Change damp bedsheets and clothing to maintain clean and dry skin, ensuring patient comfort. (5) Intervention during convulsions: (a) Take immediate action to prevent tongue injuries during convulsions. (b) Collaborate with physicians to administer sedation if necessary. (6) Oxygen inhalation: (a) Administer prescribed oxygen inhalation therapy to patients as per their medical requirements. (7) Chest physiotherapy for cough and sputum: (a) Perform body turning and back tapping techniques to promote sputum excretion in patients with a cough and excessive sputum. (c) Improve symptoms and enhance respiration in cases of pulmonary infection. (d) Administer nebulization inhalation or prescribed expectorants to thin viscous sputum, combined with body turning and tapping to facilitate expectoration if necessary. (8) Risk assessment: (a) Conduct comprehensive risk assessments for patients and implement appropriate preventive measures accordingly. (9) Enhanced protection measures: (a) Increase surveillance frequency based on the patient's condition. (b) Identify factors that may hinder elderly patients' mobility and rest, taking necessary precautions to prevent falls or bed falls and ensure patient safety. (10) Reinforced repositioning in bed: (a) Regularly reposition the patient in bed to prevent pressure injuries and other complications.

Dietary care and health education: Dietary therapy plays a fundamental role in the treatment of diabetes. The specialized nursing intervention includes the following measures: (1) Guiding patients in controlling their total caloric intake. (2) Balancing food combinations to ensure a well-rounded diet. (3) Emphasizing the importance of a diet rich in fiber. (4) Implementing scheduled and measured meals to regulate blood sugar levels. (5) Encouraging the consumption of high-protein, high-energy, and high-vitamin liquid or semi-liquid foods that are easily digestible. (6) Promoting increased water intake if the patient's condition allows for it.

The aim is to provide comprehensive dietary care to elderly patients with diabetes and concurrent pulmonary infection, supporting their overall health and well-being.

Rest and positioning: To optimize the patient's condition and facilitate recovery, the specialized nursing intervention focuses on the following aspects: (1) Providing a conducive rest environment, ensuring that the patient's room is as quiet as possible. (2) Maintaining suitable temperature and humidity levels in the patient's room. (3) Implementing bedrest to reduce oxygen consumption and conserve energy. (4) Applying appropriate positioning techniques based on the patient's condition, such as the semi-recumbent position for patients experiencing breathlessness. (5) Assisting patients in establishing good sleep habits, promoting restful and rejuvenating sleep.

These measures aim to create a comfortable and supportive environment for patients, promoting their rest and overall well-being.

Psychological care: Recognizing the impact of psychological well-being on the patient's overall health, the specialized nursing intervention includes the following psychological care measures: (1) Providing psychological intervention and support to patients with abnormal psychological conditions. (2) Calming abnormal emotional states and addressing psychological distress. (3) Preventing agitation, restlessness, or negative emotions that could increase oxygen consumption and hinder the patient's recovery process.

By addressing the psychological needs of patients, the nursing team aims to promote emotional well-being and enhance the overall effectiveness of the treatment.

Strengthening ward management: To ensure a safe and clean healthcare environment, the specialized nursing intervention emphasizes the following aspects of ward management: (1) Maintaining cleanliness in patient rooms, including regular cleaning and disinfection procedures. (2) Ensuring proper air circulation throughout the ward to minimize the risk of cross-infection. (3) Strictly adhering to nursing routines and protocols to prevent cross-infection and ensure standardized care practices.

Outcome Indices (1) Nursing intervention effectiveness: Remarkable: Laboratory tests, clinical signs, and symptoms of patients demonstrated complete restoration to the normal state following targeted treatment. X-ray examinations revealed a remarkable improvement in density and texture.

Effective: Significant improvements were observed in laboratory tests, clinical signs, and symptoms after the implementation of targeted treatment. X-ray examinations exhibited a discernible enhancement in density and texture. Ineffective: No significant changes were observed in the aforementioned indicators despite the application of targeted treatment.

(2) Hospitalization duration: Hospitalization duration refers to the period from patients' admission and the initiation of nursing care until their discharge. The duration of hospitalization for all patients was uniformly recorded by the competent medical staff in our hospital.

(3) Mastery of disease knowledge: Before and after the intervention, the Diabetes Knowledge Questionnaire and Pulmonary Infection Knowledge Questionnaire, internally developed, were employed to assess patients' mastery of disease knowledge. The scoring range was from 0 to 100, with higher scores indicating a more comprehensive understanding of the disease.

(4) Blood glucose: Before and after the intervention, a volume of 3 mL of morning fasting venous blood was collected from patients. The blood glucose levels, including fasting plasma glucose (FPG) and 2-hour postprandial glucose (2hPG), were measured using a blood glucose analyzer.

(5) Inflammatory factor: Before and after the intervention, a volume of 3 mL of morning fasting venous

Table 1. Comparison of Baseline Data

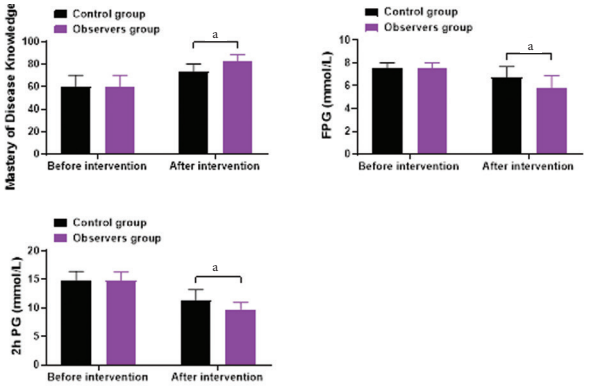
Characteristic	Control Group (n=43)	Observation Group (n=44)	t/χ^2	*P* value
Gender			0.092	.760
Male	26	28		
Female	17	16		
Age (yrs)	72.39±7.84	72.57±8.03	0.105	.916
Duration of diabetes (yrs)	9.52±2.86	9.47±2.95	0.080	.936
HbA_{1c} (%)	7.69±1.54	7.87±1.41	0.568	.571
Concomitant hypertension			0.288	.591
Yes	6	8		
No	37	36		

Abbreviations: HbA_{1c}, glycated hemoglobin.

Table 2. Comparison of Nursing Intervention Effects and Hospital Stay

Group	n	Marked Effect	Effective	Ineffective	Overall Effective Rate (%)	Hospital Stay (days)
Control	43	10	24	9	79.07%	11.32±2.07
Observation	44	15	27	2	95.45%	8.15±1.93
t/χ^2	—	—	—	—	5.285	7.390
P value	—	—	—	—	.021	<.001

Figure 2. Comparison of disease knowledge mastery and blood sugar index levels.



[a]Inter-group comparison, $P < .05$.

blood was collected from patients. After routine centrifugation, the serum was collected and analyzed for the levels of C-reactive protein (CRP) and human beta-defensin (HBP) using an automated biochemical analyzer.

(6) Comfort level: Before and after the intervention, the General Comfort Questionnaire (GCQ) was administered to comprehensively assess the patient's comfort level. This questionnaire encompasses four dimensions: physiological comfort, psychological comfort, environmental comfort, and social comfort. Each item is rated on a scale ranging from 1 to 6, with 1 indicating the lowest level of comfort and 6 indicating an exceptionally high level of comfort. Higher scores denote an improved level of patient comfort.

(7) Nursing satisfaction: A self-designed Satisfaction Survey Questionnaire was distributed to patients and their family members for evaluation. The questionnaire comprises 20 questions, allowing respondents to assess their satisfaction with the hospital's treatment and nursing interventions. Each question carries a weight of 5 points, with a total score below 70 indicating dissatisfaction, a score between 70 and 89 indicating satisfaction, and a score of 90 or above indicating high satisfaction.

Statistical Analysis

GraphPad Prism 8 software (Boston, Massachusetts USA) was used for graphing, and IBM SPSS version 22.0 software (IBM, Waltham, Massachusetts USA) was used for data analysis. Descriptive statistics using mean and standard deviation were applied for continuous data distribution, and statistical analysis was performed using t tests or analysis of variance (ANOVA). For categorical data, frequency and percentages were used to describe distributions, and statistical analysis was conducted using chi-square or Fisher's exact tests. A *P* value < .05 was considered statistically significant.

RESULTS

Comparison of Baseline Data

The baseline data of both patient groups were comparable, showing no significant differences ($P > .05$). Refer to Table 1 for details.

Comparison of Nursing Intervention Effects and Hospital Stay

The control group demonstrated an overall effective rate of 79.07%, with a hospital stay of 11.32±2.07 days. The observation group exhibited a significantly higher overall effective rate of 95.45% and a markedly shorter hospital stay of 8.15±1.93 days compared with the control group ($P < .05$). See Table 2 for details.

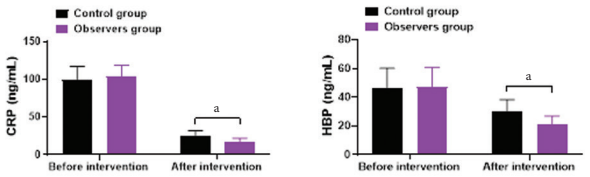
Comparison of Disease Knowledge Mastery and Blood Sugar Index Levels

As shown in Figure 2, before and after intervention the disease knowledge mastery in the control group was 59.74±10.23 and 73.04±7.25, FPG levels were 7.53±0.47 and 6.74±0.95 and 2hPG levels were 14.82±1.56 and 11.32±1.89, respectively. In the observation group, before and after intervention disease knowledge mastery was 60.15±9.87 and 82.19±6.31, FPG levels were 7.49±0.51 and 5.76±1.12 and 2hPG levels were 14.77±1.49 and 9.74±1.23, respectively. Before intervention, there were no significant differences between the 2 groups in disease knowledge mastery, FPG or 2hPG levels ($P > .05$). After intervention, the disease knowledge mastery in the observation group was significantly higher than in the control group, and FPG and 2hPG levels were significantly lower than in the control group ($P < .05$).

Comparison of Inflammatory Factor Index Levels

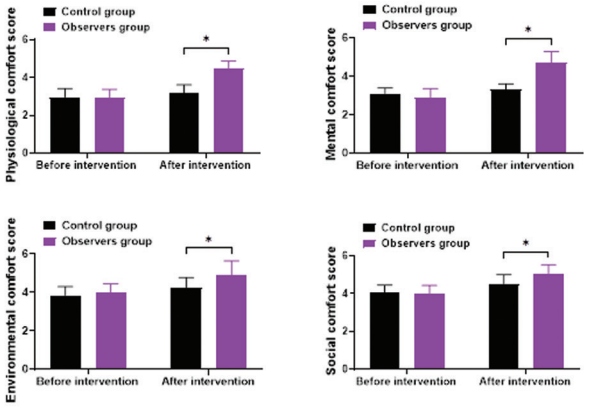
As depicted in Figure 3, before and after intervention the CRP levels in the control group were 99.57±17.27 and 25.26±6.39 and HBP levels were 46.53±13.62 and 29.65±8.64, respectively. In the observation group, before and after intervention CRP levels were 103.78±14.65 and 16.42±5.57 and HBP levels were 47.19±13.56 and 20.67±6.32, respectively. Before intervention, there were no significant differences between the 2 groups in CRP or HBP levels ($P > .05$). After intervention, both CRP and HBP levels in the observation group were significantly lower than in the control group ($P < .05$).

Figure 3. Comparison of inflammatory factor index levels.



[a]Inter-group comparison, $P < .05$.

Figure 4. Comparison of comfort levels.



[a]Inter-group comparison, $P < .05$.

Table 3. Comparison of Nursing Satisfaction Levels.

Group	n	Not Satisfied	Satisfied	Very Satisfied	Total Satisfaction Rate (%)
Control	43	11	27	5	74.42%
Observation	44	4	29	11	90.91%
χ^2	—	—	—	—	4.114
P value	—	—	—	—	.041

Comparison of Comfort Levels

As shown in Figure 4, before and after intervention the control group's physiological comfort score was 2.95±0.47 and 3.15±0.46, psychological comfort score was 3.04±0.35 and 3.32±0.29, environmental comfort score was 3.84±0.47 and 4.23±0.54 and social comfort score was 4.03±0.42 and 4.47±0.53, respectively. In the observation group, before and after intervention physiological comfort scores were 2.92±0.45 and 4.49±0.38, psychological comfort scores were 2.89±0.47 and 4.72±0.57, environmental comfort scores were 4.02±0.43 and 4.89±0.76 and social comfort scores were 3.97±0.46 and 5.03±0.49, respectively. Before intervention, there were no significant differences between the 2 groups in physiological, psychological, environmental or social comfort scores ($P > .05$). After the intervention, all comfort scores in the observation group were significantly higher than in the control group ($P < .05$).

Nursing Satisfaction Comparison

The nursing satisfaction rate in the control group was 74.42%, whereas in the observation group, it reached 90.91%. The nursing satisfaction rate in the observation group was notably higher than that in the control group ($P < .05$). Refer to Table 3 for details.

DISCUSSION

In recent years, there has been a continuous increase in the total number of patients with T2D due to population aging and improved living standards.[7] The risk for infections among elderly patients with diabetes has significantly risen due to elevated blood sugar levels and the presence of other coexisting conditions.[8] Treatment for patients with T2D and concurrent lung infection not only involves treatment with conventional medication to control infections but also demands particular attention to overall care for the elderly. The unique medication requirements of the elderly elevate the standards of care they require.[9]

Precision nursing, an emerging nursing model in recent years, has been widely applied across various clinical departments.[10-12] Precision nursing involves establishing high-level nursing standards and standardized nursing processes. It guides nurses to meticulously implement various details in nursing practices, minimizing the probability of potential issues in nursing care and maximizing both the quality of care and clinical outcomes, ultimately promoting patients' swift recovery.[13] Moreover, our study, based on precision nursing, developed specialized nursing measures tailored to the characteristics of our department. Initially, nursing staff underwent specialized training to thoroughly understand the essence of precision nursing, enhancing their grasp of nursing details and refining their nursing practices. Subsequently, a specialized precision nursing team was established to collaborate and execute precision nursing practices. Finally, specific specialized nursing measures were formulated targeting lung infections in elderly patients with diabetes. We believe that precision specialized nursing interventions can further prevent negligence or errors in nursing practices, consequently enhancing the quality of patient care.

Elderly patients with T2D commonly have multiple complications, poor physical conditions and unstable blood sugar control.[14] Once these patients contract a lung infection, they are prone to adverse outcomes. Even if their condition improves, they tend to have prolonged illnesses compared with patients who do not have diabetes, among other complications.[15] The precision specialized nursing used in this study involved caring for patients with diabetes with lung infections from various perspectives: environmental, physiological, psychological and social. It aimed to reduce patients' stress levels caused by tension and anxiety. Individualized care was provided for symptoms such as coughing, fever and breathing difficulties in patients with lung infections. Measures like repositioning, back tapping and sputum suction performed every 2 hours were applied to further facilitate the resolution of lung infection lesions. Moreover, diabetic nutritional management education was conducted to ensure adequate nutrition for patients, enhance their immune systems, improve resistance, and promote recovery. Simultaneously, managing the ward environment and visitation systems effectively reduced cross-infections and the risk for introducing bacteria, thereby aiding patient recovery.

The results of our study indicated that the intervention's overall effectiveness in the observation group was significantly higher than in the control group, while hospitalization duration was significantly shorter in the observation group than in the control group ($P < .05$). After the intervention, the observation group showed significantly higher levels of disease knowledge compared with the control group, and both FPG and 2h-PG levels were significantly lower in the observation group than in the control group ($P < .05$). The observation group's comfort levels in terms of physical, psychological, environmental and social aspects were significantly higher than in the control group after the intervention ($P < .05$). The control group had a nursing satisfaction rate of 74.42%, while the observation group had a satisfaction rate of 90.91%, which was significantly higher ($P < .05$). These results align with previous studies,[16-18] demonstrating the positive effects of using precision specialized nursing to improve the condition of patients with T2D with concomitant lung infection.

CRP and HBP are non-specific systemic inflammatory markers. CRP, an acute-phase protein, usually indicates inflammation, infection or other disease when found at high levels.[19] HBP, on the other hand, is a multifunctional granule-related protein produced by neutrophils. As a chemotactic agent, it mainly activates monocytes and macrophages to release various inflammatory substances, leading to tissue inflammatory edema.[20] The results of this study revealed that after the intervention, both CRP and HBP levels were significantly lower in the observation group than in the control group ($P < .05$). This outcome suggests that precision nursing, in tandem with therapeutic measures, further promotes the resolution of inflammatory stress in infected patients, aiding in their recovery.

The findings of this study have significant clinical relevance as they demonstrate the positive impact of the refined specialized nursing intervention in elderly patients with diabetes with concurrent pulmonary infection. Our study showed that compared with routine nursing intervention, refined specialized nursing intervention resulted in improved outcomes in several key parameters:

First, the nursing intervention in the observation group was found to be more effective, leading to notably shorter hospital stays. This suggests that refined specialized nursing intervention facilitated a faster recovery and improved the overall condition of the patients. By implementing personalized nursing plans tailored to the specific needs of each patient, the intervention addressed the complex conditions of elderly patients with diabetes with pulmonary infection more effectively.

Second, the observation group exhibited higher levels of disease knowledge acquisition and better control of blood glucose levels. This indicates that refined specialized nursing intervention enhanced patient education and self-management of diabetes. By improving disease knowledge and glucose control, the intervention may contribute to long-term health outcomes and reduce the risk for complications in these patients.

Third, the intervention resulted in reduced levels of inflammatory markers, such as C-CRP and HBP. This suggests that refined specialized nursing intervention helped mitigate the systemic inflammatory response associated with pulmonary infection. By reducing inflammation, the intervention may contribute to improved prognosis and faster recovery.

Moreover, the observation group reported higher comfort levels, including physiological, psychological, environmental and social comfort. This indicates that refined specialized nursing intervention created a more favorable and supportive care environment for the patients. Enhanced comfort levels can contribute to a better patient experience during hospitalization and may positively impact their overall well-being and satisfaction with care.

Summary

Overall, the findings of this study demonstrate that refined specialized nursing intervention in elderly patients with diabetes and concurrent pulmonary infection can lead to meaningful improvements in various parameters. These improvements include faster recovery, increased disease knowledge, better glucose control, reduced inflammation and enhanced patient comfort. By addressing the specific needs of this patient population, refined nursing intervention has the potential to improve outcomes and promote a more patient-centered approach to care.

Study Limitations

It is important to acknowledge the limitations of this study, as they may have an impact on the generalizability of the results. First, this study was conducted at a single hospital, which may limit the generalizability of the findings to other healthcare settings or populations. The effectiveness of refined specialized nursing intervention may vary in different contexts, and further research is needed to confirm these findings in diverse settings. Second, this study was retrospective in nature, relying on the analysis of existing clinical data. Retrospective studies are subject to inherent limitations, such as the potential for selection bias and incomplete or missing data. These limitations may affect the internal validity of the study and should be considered when interpreting the results. In addition, the study focused on a specific population of elderly patients with diabetes and concurrent pulmonary infection. The findings may not be directly applicable to other patient groups or different comorbidities. Further research is needed to investigate the effectiveness of the refined specialized nursing intervention in diverse patient populations. Furthermore, the study primarily assessed short-term outcomes and did not explore long-term follow-up or the impact of the intervention on patient survival rates or other long-term clinical outcomes. Future studies should consider evaluating the sustained effects of refined nursing intervention over a more extended period.

Despite these limitations, this study provides valuable insights into the potential benefits of refined specialized nursing intervention in elderly patients with diabetes and

concurrent pulmonary infection. Further research with larger sample sizes and diverse populations is warranted to validate these findings and optimize the implementation of refined nursing intervention models in clinical practice.

CONCLUSION

The application of precision specialized nursing intervention in elderly patients with diabetes and concurrent lung infection demonstrates significant effectiveness. Compared with conventional nursing intervention, precision specialized nursing significantly enhances patient comfort and disease knowledge during hospitalization, swiftly regulates patients' blood sugar levels and reduces their body's inflammatory responses, thus fostering better recovery. In addition, precision specialized nursing intervention also moderately increases both patient and their family members' satisfaction with nursing care. This bears significant importance in promoting harmony between medical staff and patients, suggesting its considerable value in clinical application and wider adoption.

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