

Effects of holistic nursing on chronic pulmonary heart disease complicated with heart failure

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ABSTRACT

Objective: To evaluate the effects of holistic nursing on chronic pulmonary heart disease (CPHD) complicated with heart failure (HF).

Methods: A total of 60 CPHD patients complicated with HF in Department of Cardiology of our hospital from January 2018 to December 2019 were selected, and divided into 2 groups using a random number table (n=30). Routine nursing was given in control group, while holistic nursing was given in observation group. The negative emotion score, treatment compliance, pulmonary ventilation function, cardiac function and quality-of-life score were compared between the two groups.

Results: After nursing, the self-rating anxiety scale (SAS) and self-rating depression scale (SDS) scores were lower in observation group than those in control group (P<0.05). The total rate of treatment compliance was higher in observation group (93.33%) than that in control group (73.33%) (P<0.05). After nursing, the forced expiratory volume in 1 s (FEV1), FEV1/forced vital capacity (FVC), and left ventricular ejection fraction were higher and the 6-min walking distance was longer in observation group than those in control group, while observation group had a lower quality-of-life score than control group (P<0.05).

Conclusion: Holistic nursing can relieve negative emotions, enhance treatment compliance, improve cardiopulmonary function, and augment the quality of life of CPHD patients complicated with HF.

Key words: cardiology, holistic nursing, chronic pulmonary heart disease, heart failure.

1. Introduction

Chronic pulmonary heart disease (CPHD) is a common type of heart disease caused by pulmonary arterial hypertension. After the onset of disease, patients are often accompanied by heart failure (HF), seriously threatening their lives. (Benza et al., 2015) (Gavazzi et al., 2015) (Campo et al., 2015). CPHD patients complicated with HF should receive symptomatic treatment. (Guo Y. et al., 2015). During the treatment, however, some patients suffer from problems such as low

compliance and poor psychological status, thus affecting the treatment effect and harming the prognosis. (Chang W.T. et al., 2016). Therefore, nursing intervention is also needed. Holistic nursing is a nursing model characterized by "integration of nursing services", in which the holistic nursing services are emphasized for patients in medical activities. Its nursing plan forms a whole, and its nursing measures are more comprehensive and coherent. To explore the effect of this nursing model on CPHD complicated with HF, a total of 60 CPHD patients complicated with HF in the Department of Cardiology of our hospital from January 2018 to December 2019 were enrolled in this paper, and a randomized controlled study was conducted.

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2. Materials and methods

2.1. Baseline clinical data

A total of 60 CPHD patients complicated with HF in Department of Cardiology of our hospital from January 2018 to December 2019 were selected, and divided into 2 groups using a random number table ($n=30$). In control group, there were 16 males and 14 females aged 50-83 years old, with an average of (66.59 ± 12.31) years old. In observation group, there were 17 males and 13 females aged 50-84 years old, with an average of (66.78 ± 12.23) years old. The age and gender of patients were comparable ($P>0.05$). This study was approved by the Medical Ethics Committee, and the patients and their families gave informed consent to the study.

2.2. Methods

Routine nursing was given in control group. For example, the drugs were administered according to the doctor's instructions, and the patients were informed of the specific medication methods and precautions after medication, and instructed to rest in bed, with the bedhead elevated by 30° and the head tilting to one side.

In observation group, holistic nursing was given, the holistic nursing group was established, and the holistic nursing plan was discussed and developed by the group. The nursing measures were specifically as follows: (1) Psychological nursing: The group members actively talked with the patient, listened to the patient's complaints, summarized the psychological problems of the patient and analyzed their causes when listening, then provided targeted psychological counseling, comforted the patient, and carried out health education by means of health knowledge manuals and videos about the knowledge of CPHD complicated with HF, such as cause of disease and treatment methods, in a gentle voice as far as possible. (2) Music nursing: Based on the patient's preference, soft and relaxing music was played, such as folk music (*Dancing Butterflies, High Mountain and Running River*) and piano music (*For Elise, Moonlight, Spring Song*), to guide the patient to relax with the music, and the volume was adjusted according to the environment. (3) Diet nursing: The patient was instructed to eat more high-fiber and high-vitamin foods, such as fresh fruits and vegetables. The diet should be light, highly digestible, and low in calorie, salt and fat. The group members massaged the abdomen of patients after meals to promote gastrointestinal motility and avoid increasing the heart load due to

unsmooth defecation and excessive straining. (4) Cardiopulmonary training guidance: The patient was instructed to lie on the bed quietly with eyes closed slightly and muscles of the whole body relaxed, and slowly took deep breaths (inhaled through noses, and exhaled through the mouth) for 5 min, twice a day. (5) Environmental nursing: The ward environment of patients during hospitalization was improved, the indoor air was disinfected regularly, the indoor light was adjusted to a soft state, and direct sunlight was avoided. The indoor temperature and indoor humidity were controlled at $22-25^\circ\text{C}$ and 50-60%, respectively. Moreover, warm posters were put up on the wall, and living articles and daily necessities were supplemented. The curtains were hung, thus creating an independent space for patients and protecting their privacy, and the room should be kept as quiet as possible.

2.3. Observation indices

The negative emotion score, treatment compliance, pulmonary ventilation function, cardiac function and quality-of-life score were compared between the two groups.

Negative emotion score: The self-rating anxiety scale (SAS, 0-100 points) and self-rating depression scale (SDS, 0-100 points) were used for evaluation. The score is positively proportional to the degree of anxiety and depression. (Xu W. et al., 2016).

Treatment compliance: Full compliance (the patient consciously cooperated in the treatment), partial compliance (the patient cooperated in the treatment after supervision), and non-compliance (the patient always resisted the treatment). Total compliance rate = (full compliance cases + partial compliance cases)/total cases $\times 100\%$.

Pulmonary ventilation function indices included forced expiratory volume in 1 s (FEV1) and FEV1/forced vital capacity (FVC), and they were detected using a Medisoft/BODYBOX lung function tester (Medisoft, Belgium).

Cardiac function indices included left ventricular ejection fraction (LVEF) and 6-min walking distance. LVEF was measured through color Doppler ultrasonography. 6-min walking distance (the total distance of walking for 6 min) was mainly measured using a tape.

The quality-of-life score was given using the Minnesota living with heart failure questionnaire,

including three domains: emotion (0-25 points), body (0-40 points) and others (0-40 points). The total score is 0-105 points, and it is inversely proportional to the quality of life. (Wan C. et al., 2014).

2.4. Statistical analysis

3. Results

3.1. Negative emotion scores

The SAS and SDS scores in both groups were lower after nursing than those before nursing ($P < 0.05$). The SAS and SDS scores had no significant differences between the two groups before nursing ($P > 0.05$), while they were lower in observation

All data were statistically analyzed by SPSS 22.0 software. The numerical data (n) were subjected to the χ^2 test, and the quantitative data ($\bar{x} \pm s$) were subjected to the t test. $P < 0.05$ was considered statistically significant.

group than those in control group after nursing ($P < 0.05$) (Table 1).

3.2. Treatment compliance

The total rate of treatment compliance was higher in observation group (93.33%) than that in control group (73.33%) ($P < 0.05$) (Table 2).

Table 1: Negative emotion scores ($\bar{x} \pm s$, point)

Group	Time	SAS score	SDS score
Control (n=30)	Before nursing	54.57±6.91	55.28±6.74
	After nursing	47.23±5.47#	48.37±5.86#
Observation (n=30)	Before nursing	54.43±6.95	55.16±6.80
	After nursing	41.68±4.83#*	42.50±5.19#*

Compared with the same group before nursing, # $P < 0.05$; compared with control group, * $P < 0.05$.

Table 2: Treatment compliance [case (%)]

Group	Case	Full compliance	Partial compliance	Non-compliance	Total compliance rate
Control	30	8 (26.67%)	14 (46.67%)	8 (26.67%)	22 (73.33%)
Observation	30	12 (40.00%)	16 (53.33%)	2 (6.67%)	28 (93.33%)*

Compared with control group, * $P < 0.05$.

3.3. Pulmonary ventilation function and cardiac function indices

After nursing, FEV1, FEV1/FVC, LVEF and 6-min walking distance were increased in the two groups

compared with those before nursing, while they were higher and longer in observation group than those in control group ($P < 0.05$) (Table 3).

Table 3: Pulmonary ventilation function and cardiac function indices

Group	Time	FEV1 (L)	FEV1/FVC (%)	LVEF (%)	6-min walking distance (m)
Control (n=30)	Before nursing	1.59±0.22	52.14±4.39	37.64±4.87	304.63±52.47
	After nursing	1.83±0.24#	57.62±5.13#	43.17±5.52#	372.59±65.18#
Observation (n=30)	Before nursing	1.60±0.23	52.29±4.35	38.29±4.91	305.38±52.04
	After nursing	2.09±0.27#*	63.94±6.07#*	49.36±6.25#*	443.72±70.35#*

Compared with the same group before nursing, # $P < 0.05$; compared with control group, * $P < 0.05$.

3.4. Quality-of-life scores

The quality-of-life score was lower in the two groups after nursing than that before nursing ($P < 0.05$). There was no significant difference in the

quality-of-life score between the two groups before nursing ($P > 0.05$), and the score was lower in observation group than that in control group after nursing ($P < 0.05$) (Table 4).

Table 4: Quality-of-life scores ($\bar{x} \pm s$, point)

Group	Time	Emotion	Body	Others	Total score
Control (n=30)	Before nursing	9.53±1.72	14.36±2.10	13.91±1.87	37.82±5.68
	After nursing	7.89±1.43#	12.27±1.82#	12.05±1.54#	32.21±4.79#
Observation (n=30)	Before nursing	9.40±1.75	14.15±2.17	13.76±1.83	37.31±5.64
	After nursing	6.47±1.29#*	10.46±1.65#*	10.51±1.32#*	27.44±4.26#*

Compared with the same group before nursing, # $P < 0.05$; compared with control group, * $P < 0.05$.

4. Discussion

CPHD mainly refers to the heart disease caused by the increase in pulmonary arterial pressure due to pulmonary tissue and pulmonary artery lesions, whose incidence is mainly related to chronic obstructive pulmonary disease. In the late stage of chronic obstructive pulmonary disease, there are abnormal changes in pulmonary blood vessels in patients, and the pulmonary parenchyma is destroyed, leading to pulmonary ventilation dysfunction and pulmonary arterial hypertension, and ultimately causing heart disease. (van Riel et al., 2015) (Krahnke et al., 2015) (Raina et al., 2015). After the onset of CPHD, patients are often accompanied by cardiac injury and complicated with HF, worsening the patients' condition and seriously threatening the life safety of patients. (Bhuvavajhala et al., 2015). Therefore, prompt treatment is advocated for CPHD patients complicated with HF in clinical practice.

During the treatment of CPHD complicated with HF, the patients are prone to poor treatment compliance and unhealthy emotions due to the condition of disease, which is not conducive to the implementation of therapeutic regimen, and may affect the treatment effect. Therefore, nursing intervention is also needed for patients. (Luo L. et al., 2020). Previously, routine nursing measures were often taken for CPHD complicated with HF, such as simple medication guidance, but they were less targeted and the effect of nursing intervention was not satisfactory. Different from routine nursing, holistic nursing model emphasizes the integration of nursing services, and the nursing plan is mainly developed based on the core idea of "integration". Compared with the routine nursing plan, the holistic nursing plan is more intact, targeted and comprehensive throughout the patient's medical activities. (Mandal L. et al., 2020). In this study,

References

- Benza, Raymond L., Raina, Amresh, Abraham, William T. et al. (2015). Pulmonary hypertension related to left heart disease: Insight from a wireless implantable hemodynamic monitor. *The Journal of heart and lung transplantation*, 34(3), 329-337.
- Gavazzi, Antonello, De Maria, Renata, Manzoli, Lamberto et al. (2015). Palliative needs for heart failure or chronic obstructive pulmonary disease: Results of a multicenter observational registry. *International Journal of Cardiology*, 184, 552-558.
- Campo, Gianluca, Pavašini, Rita, Malagu, Michele et al. (2015). Chronic Obstructive Pulmonary Disease and Ischemic Heart Disease Comorbidity: Overview of Mechanisms and Clinical Management. *Cardiovascular drugs and therapy*, 29(2), 147-157.
- Guo Y, Zhao D, Liu J. Epidemiological study of heart failure in China. (2015). *Cardiovascular Innovations and Applications*, 1(1), 47-55.
- Chang WT, Weng SF, Hsu CH, Shih JY, Wang JJ, Wu

observation group was treated with holistic nursing, and compared with control group treated with routine nursing. It was found that (1) after nursing, observation group had lower SAS and SDS scores and a higher total rate of treatment compliance than control group. Holistic nursing can enhance the treatment compliance and improve the psychological status of CPHD patients complicated with HF. The main reason is that in the holistic nursing plan, the psychological nursing can help patients solve their psychological problems, and music nursing can make patients relax and adjust mood, thereby reducing the negative emotions and enabling the patients to better cooperate in the treatment. (2) After nursing, FEV1, FEV1/FVC, and LVEF were higher and 6-min walking distance was longer in observation group than those in control group, suggesting that holistic nursing can improve the pulmonary function and cardiac function of CPHD patients complicated with HF. It is mainly because the more intact holistic nursing plan can raise the treatment compliance of patients, so that nursing intervention can be fully implemented, thus ensuring the treatment effect. (3) After nursing, the quality-of-life score in observation group was lower than that in control group, indicating that holistic nursing can enhance the quality of life of CPHD patients complicated with HF. The main reason is that holistic nursing improves the pulmonary function and cardiac function of patients, which is conducive to controlling the condition of disease and reducing the interference of disease on the quality of life.

In conclusion, holistic nursing can effectively relieve negative emotions, enhance treatment compliance, help improve pulmonary ventilation function and cardiac function, and raise the quality of life of CPHD patients complicated with HF.

- CY, Chen ZC. (2016). Prognostic factors in patients with pulmonary hypertension—a nationwide cohort study. *Journal of the American Heart Association*, 5(9), e003579.
- Xu W, Yao J, Chen L. (2016). Anxiety in Patients with Chronic Cor Pulmonale and Its Effect on Exercise Capacity. *Anxiety in Patients with Chronic Cor Pulmonale and Its Effect on Exercise Capacity. Iran J Public Health*, 45(8), 1004-1011.
- Wan C, Li H, Fan X, Yang R, Pan J, Chen W, Zhao R. (2014). Development and validation of the coronary heart disease scale under the system of quality of life instruments for chronic diseases QLICD-CHD: combinations of classical test theory and Generalizability theory. *Health and quality of life outcomes*, 12(1), 82.
- van Riel, Annelieke C. M. J., de Bruin-Bon, Rianne H. A. C. M., Gertsen, Emma C. et al. (2015). Simple stress echocardiography unmasks early pulmonary vascular disease in adult congenital heart disease. *International Journal of Cardiology*, 197, 312-314.
- Krahnke, Jason S., Abraham, William T., Adamson, Philip B. et al. (2015). Heart Failure and Respiratory Hospitalizations Are Reduced in Patients With Heart Failure and Chronic Obstructive Pulmonary Disease With the Use of an Implantable Pulmonary Artery Pressure Monitoring Device. *Journal of cardiac failure*, 21(3), 240-249.
- Raina, Amresh, Abraham, William T., Adamson, Philip B. et al. (2015). Limitations of right heart catheterization in the diagnosis and risk stratification of patients with pulmonary hypertension related to left heart disease: Insights from a wireless pulmonary artery pressure monitoring system. *The Journal of heart and lung transplantation*, 34(3), 438-447.
- Bhryavavajhala, Srinivas, Velam, Vanajakshamma, Polapragada, Nishanth V. et al. (2015). Reliability of Doppler-Based Measurement of Pulmonary Vascular Resistance in Congenital Heart Disease with Left-to-Right Shunt Lesions. *Echocardiography*, 32(6), 1009-1014.
- Luo L, Li J, Lian S, Zeng X, Sun L, Li C, Huang D, Zhang W. (2020). Using machine learning approaches to predict high-cost chronic obstructive pulmonary disease patients in China. *Health informatics journal*, 26(3), 1577-98.
- Mandal L, Seethalakshmi A, Rajendrababu A. (2020). Rationing of nursing care, a deviation from holistic nursing: A systematic review. *Nursing Philosophy*, 21(1), e12257.