The clinical effect of WeChat-based MUST education model on patients with chronic heart failure

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Abstract

Objective: To explore the effect of WeChat-based MUST nursing intervention on self-care ability and quality of life in patients with chronic heart failure.

Method: Convenient sampling was used to select CHF patients who received treatment in XX Hospital from January 1, 2020, to December 30, 2020, as the study subjects and was divided into the experimental group (n = 60) and the control group (n = 60) according to the random number table. The experimental group used the WeChat-based MUST nursing intervention, and the control group used the routine education and follow-up model. Cardiac function parameters, self-care ability, and other indicators were compared between the two groups before and after nursing. The clinical effect of two groups was evaluated.

Results: After the nursing intervention, LVEF levels were increased to different extents and NT-proBNP was decreased to different extents in both groups. LVEF level in the experimental group was higher than that in the control group, and the NT-proBNP level in the experimental group was lower than that in the control group. After the nursing intervention, the self-care ability and quality of life of the two groups were increased to varying degrees. Self-care ability was higher in the experimental group than in the control group, and quality of life was higher in the experimental group than in the control group.

Conclusion: The WeChat-based MUST nursing intervention model in patients with chronic heart failure, compared with the conventional cardiology nursing model, can effectively improve the self-care ability of patients, improve the knowledge level and quality of life of patients with heart failure, and reduce the readmission rate.

KEYWORDS
chronic heart failure, MUST, outcome evaluation, self-care, WeChat
1 | INTRODUCTION

Chronic heart failure (CHF) is a series of syndromes mainly characterized by dyspnea, significantly decreased exercise tolerance, and excessive sodium and water load due to various chronic cardiomyopathies and long-term ventricular overload, resulting in decreased myocardial contractility, decreased cardiac output, and insufficient venous return bleeding, which in turn result in hypoperfusion (Tougaard et al., 2020; Wang, Chen, & Dong, 2019). Chronic heart failure, as the terminal stage of various structural heart diseases, has high morbidity and mortality. It has been reported that there are about 8.9 million patients with heart failure and about 200,000 new patients with heart failure each year in China (Hu et al., 2019), and there are characteristics that the incidence and prevalence increase with age (Wang, Zhou, et al., 2019). Chronic heart failure is characterized by high incidence, recurrent attacks, poor prognosis, and long duration of disease, which predisposes to negative emotions such as anxiety and depression and seriously affects people's quality of life (Chen et al., 2020; Kiuchi et al., 2020). Therefore, scientific and effective nursing intervention is important for the rehabilitation of patients with chronic heart failure. Studies have shown that CHF patients are often hospitalized repeatedly due to illness deterioration, which is mainly due to poor self-care behavior (Bader et al., 2018). Good self-care behavior will help to improve the quality of life of patients with chronic heart failure and reduce their rehospitalization rate and mortality (Sezgin et al., 2017). However, in China, patients with chronic heart failure generally have low awareness of the disease and poor self-care behaviors (Tian et al., 2022). The educational nursing model (MUST) composed of doctors, patients' families, patients, and nurses emphasizes the importance of doctors and nurses in maintaining the scientific nature of health education and implementing continuous long-term education, and emphasizes the special important role of patients' families in chronic heart failure education and in improving patients' self-care behavior. The initial use of diabetes education in China has improved patient self-care behavior. At the same time, WeChat, as a rapidly developing mobile media, because of its low cost, intelligent customization, and characteristic consultation, can penetrate the concept of health into social groups and people's social circles, so as to provide personalized health services. This article discusses the effect of WeChat-based MUST nursing intervention model on self-care ability and quality of life of CHF patients and provides some clinical basis for the continuous improvement of nursing programs for CHF patients in China. The specific data and results are reported as follows.

2 | MATERIALS AND METHODS (researchregistry7453; 02/06/2020)

2.1 | Research object

Convenient sampling was used to select CHF patients who received treatment in XX Hospital from January 1, 2020, to December 30, 2020, as the study subjects, and was divided into the experimental group (n = 60) and the control group (n = 60) according to the random number table.

Inclusion criteria: (1) meet the diagnostic criteria of “Chinese Guidelines for the Diagnosis and Treatment of Heart Failure 2014” (Wang, 2016); (2) the course of the disease is ≥6 months, and New York (NYHA) functional classification II–IV; (3) age >18 and ≤80 years; (4) conscious, no communication disorders, and no movement disorders; (5) patients or their primary caregivers can use mobile phones to communicate and have some learning ability; and (6) the patient and his family given informed consent.

Exclusion criteria: (1) patients with severe cardiovascular diseases such as acute coronary syndrome and myocardial infarction; (2) patients with severe diseases of other important organs; (3) patients with disturbance of consciousness or mental illness; and (4) patients who drop out of the study due to personal reasons.

This study was approved by the Medical Ethics Committee of XX Hospital. (Approval No.: researchregistry7453).

2.2 | Methods

The patients in the control group and the experimental group were followed up for 6 months after discharge. Nursing staff's early unified training, and their working years, education, and follow-up management are similar.

After admission, the patients in the experimental group were treated with standardized treatment and WeChat-based MUST education nursing model was used. The MUST model was built under this philosophy and was initially used for diabetes education (Yu et al., 2015), improving patient's self-care behaviors. The MUST management model is composed of doctors, patients’ families, patients, and nurses. Among them, doctors play the role of managers (Manager, M), responsible for the development and evaluation of treatment plans for patients with chronic heart failure and the work of training nurses; family members play the role of supervisors (Urger, U), supervise and ensure the mastery and application of knowledge of patients with heart failure, ensure that patients regularly receive the education of doctors and nurses, and have the obligation to actively contact medical staff; patients themselves, that is, self-managers (S), are the target population in this model, requiring continuous conscious enrichment and use of chronic heart failure disease knowledge, receiving the teach of doctors and nurses, and receiving the supervision of patients’ families. Nurses are chronic heart failure health education program development and specific instructors (Teacher, T), asked to receive the training of doctors, and specifically complete the education and liaison of patients with chronic heart failure. The specific contents are as follows:

Establish a MUST management system consisting of physicians, patients, and their primary caregivers and nurses. Physicians act as managers and are responsible for developing and evaluating patient treatment plans and training nurses. The primary caregiver plays the role of URGERS (U), supervising and ensuring that the
patient understands and applies the knowledge about heart failure, checking that the patient has received regular education from doctors and nurses, and has the obligation to actively contact medical staff. Patients are the target population in the system and are self-managers; they are required to continually and consciously enrich and use knowledge about CHF, to be educated by physicians and nurses, and to be supervised by primary caregivers. Nurses are teachers (T) who develop CHF health education programs for patients. They are trained by physicians and educate and liaise CHF patients.

Personalized training includes CHF etiology, factors, clinical symptoms, side effects of commonly used drugs and related preventive measures, behavioral intervention, self-monitoring, and regular follow-up.

(1) One day before discharge. Doctors reassess the patient's condition and health status, develop post-treatment plans, and train nurses. After the training, the nurses informed the patients of the matters needing attention after discharge and reiterated that the patients and the main nursing staff pay attention to the WeChat Official Account in the Department of Cardiology. They joined the WeChat patient group to confirm that they were skilled in mastering the WeChat Official Account method and could learn and practice independently according to the regulations so as to ensure that the patients could use it regularly and consciously after discharge. (2) After discharge. Nurses emphasized the importance of self-care through WeChat groups and instructed patients to continue to pay attention and read WeChat Official Account. According to the patient's health status, one needs to develop a personal behavior change plan, such as a rest management program, supine care, exercise guidance, personalized nutrition guidance and smoking cessation, and timely incentive feedback. The patient was sent to the nurse via WeChat every Friday after a self-assessment (or assessment by the primary caregiver). (3) Task reminder. According to the patient's condition and medication after discharge, the nurses set the daily reminder directory after discharge, edit the corresponding contents according to the directory, and inform the main nursing staff to set the reminder alarm clock, including rest, exercise, and timely medication. After receiving the reminder, the patient or the main nursing staff received it through the WeChat group. (4) Content push. A weekly guide on disease-related knowledge or self-care skills was pushed by team members on the importance of self-management, health education, the need for compliance, self-care skills guidance, chronic heart failure symptoms, and treatment methods. (5) Face-to-face follow-up. At least once a month, doctors and nurses trained and consulted patients during the follow-up period, and adjusted the treatment plan according to the feedback results of patients and their main caregivers.

Patients in the control group were treated with standardized treatment according to the patient's condition after admission and were followed up with routine education. Telephone follow-up was performed once a week for about 20 min; home follow-up was performed once a month for about 60 min.

Details are as follows:

On the 1st day before discharge, individualized discharge health education was formulated according to the patients' mastery of self-care-related knowledge and skills, including disease health education, psychological nursing, treatment plan, common drug use methods, compliance with medical orders, and adverse reactions after medication. At the same time, patients were ordered to give up smoking and guide their activities. Doctors and nurses instruct patients as they leave the hospital. Health education and family follow-up are conducted by telephone after discharge.

Health education includes (1) psychological counseling: to evaluate the psychological status of patients, analyze the impact of gender, age, education, and other factors on their psychological status, and implement personalized psychological counseling measures according to the individual characteristics and psychological characteristics of patients; (2) life guide: explain to patients and their families the impact of healthy lifestyles on disease recovery, including limiting daily salt intake and eating more light, cellulose-rich foods to ensure smooth defecation; (3) functional exercise: guide and encourage patients to aerobic exercises, such as cycling, walking, and amount of exercise will gradually increase (exercise intensity should not cause palpitations and increase in pulse after exercise should not exceed 20 times/min); and (4) medication guidance: explain to patients the necessity of following doctor's advice and keep them in the habit of taking medicine regularly for a long time.

2.3 | Observation indexes

Before and after the intervention, the following clinical indicators were evaluated in both groups.

1. Cardiac function: including left ventricular ejection fraction (LVEF) and NT-proBNP.
2. Self-care ability: The Self-Care Ability Scale (ESCA) (Zhao & Hongyan, 2020) was developed by American scholars on the basis of Orem theory, which was mainly used to evaluate individual self-care ability, including four aspects of health knowledge, self-care responsibility, self-care skills, and self-concept, including 43 items, each item 0–4 points, and the total score 0–172 points. The higher the score, the stronger the patient's self-care ability.
3. Knowledge level of heart failure: The knowledge level of heart failure was assessed by the Heart Failure Knowledge Scale developed by Artinian (Chen et al., 2019). The scale mainly involves the etiology and symptoms of heart failure, the selection of low-salt foods, the role and side effects of drugs, and the lifestyles that patients with heart failure need to adhere to. There are 12 selection questions and 1 blank-filling question. 1 point for the correct answer and 0 point for the wrong answer; the score range is 0–13. The higher the score, the higher the knowledge of heart failure.
4. Quality of life: The health status questionnaire (SF-36) was used for evaluation. The questionnaire included four dimensions: physiological function, general health status, mental health, and social function. Each dimension had 100 points. The higher the score, the higher the quality of life.
5. Incidence of cardiovascular events and readmission rate.
2.4 | Assessment method

All patients had data collected by the head nurse and nurse in charge through the follow-up clinic at admission and 6 months after the intervention.

2.5 | Statistical methods

SPSS 22.0 statistical software was applied for data processing. Shapiro–Wilk test was used to test whether the data conformed to the normal distribution. The measurement data conformed to the normal distribution were expressed as mean±standard deviation. The two independent samples t-test was used for comparison. Enumeration data were expressed as frequency, and χ² test was used for comparison. p < .05 was considered statistically significant.

3 | RESULTS

3.1 | Baseline characteristics of research subjects

A total of 120 patients were included in this study, including 67 males and 53 females, aged 38–74 years, with a disease course of 5–6 months and BMI of 18–25 kg/m². Cardiac functional classification was grade II in 21 patients, grade III in 67 patients, and grade IV in 32 patients. There were 77 cases of the inertial disease, 25 cases of dilated cardiomyopathy, 11 cases of valvular heart disease, and 7 cases of rheumatic heart disease. The comparison of basic information in the two groups was shown in Table 1.

3.2 | Comparison between the two groups before and after cardiac function nursing

Compared with the cardiac function of the two groups, there was no significant difference in LVEF and NT-proBNP between the two groups before intervention. After the nursing intervention, the LVEF levels of the two groups were increased to varying degrees, and NT-proBNP levels were decreased to varying degrees. LVEF level in the experimental group was higher than that in the control group (54.88 ± 3.18 vs. 47.47 ± 1.18, t = 11.258, p = .000). There was no difference in heart failure knowledge level between the experimental group and the control group (10.22 ± 0.54 vs. 8.98 ± 0.57, t = 2.550, p = .031). The NT-proBNP level in the experimental group was lower than that in the control group (647.31 ± 342.67 vs. 2433.97 ± 984.34, t = 15.374, p = .000), as shown in Table 2.

3.3 | Comparison of self-care ability, knowledge of heart failure, and quality of life between the two groups

There were no significant differences in self-care ability, knowledge level of heart failure, and quality of life between the two groups before intervention, and the differences in self-care ability, knowledge

|                | Experimental group (n = 60) | Control group (n = 60) | χ²/t | p   |
|----------------|----------------------------|-----------------------|------|-----|
| Gender (n)     |                            |                       |      |     |
| Male           | 36                         | 31                    | 0.845| .358|
| Female         | 24                         | 29                    |      |     |
| Age (year)     | 58.31 ± 7.38               | 60.37 ± 8.83          | 1.138| .133|
| Course (year)  | 3.63 ± 0.69                | 3.46 ± 0.58           | 1.347| .084|
| BMI (kg/m²)    | 21.38 ± 2.36               | 22.75 ± 2.11          | 0.955| .427|
| Educational degree (n) |                 |                       |      |     |
| Junior high school and below | 22                 | 19                    | 0.333| .564|
| High school and above       | 38                 | 41                    |      |     |
| Smoke (n)      |                            |                       |      |     |
| Yes            | 21                         | 27                    | 1.250| .264|
| No             | 39                         | 33                    |      |     |
| Cardiac functional grading |                 |                       |      |     |
| II             | 12                         | 9                     | 0.927| .629|
| III            | 31                         | 36                    |      |     |
| IV             | 17                         | 15                    |      |     |
| Cardiac basic diseases |                |                       |      |     |
| Coronary heart disease      | 36                 | 41                    | 2.105| .557|
| Dilated cardiomyopathy      | 5                  | 6                     |      |     |
| Valvular heart disease       | 19                 | 13                    |      |     |

TABLE 1 Comparison of baseline characteristics between the two groups of CHF patients
level, and quality of life between the two groups before intervention. After the nursing intervention, the self-care ability and quality of life of the two groups increased to varying degrees. After the intervention, the self-care ability of the experimental group was higher than that of the control group (128.34 ± 2.15 vs. 113.45 ± 1.28, \( t = 31.925, p = .000 \)). The cognitive level of heart failure of the experimental group was higher than that of the control group (10.22 ± 0.54 vs. 8.98 ± 0.57, \( t = 3.550, p = .011 \)). The quality of life in the experimental group was higher than that in the control group (290.32 ± 15.76 vs. 220.37 ± 15.76, \( t = 11.495, p = .000 \)), as shown in Table 3.

### 3.4 Incidence of cardiovascular events and readmission rates within 6 months

After the intervention, the incidence of cardiovascular events and readmission rate within 6 months in the experimental group were lower than those in the control group (\( p < .05 \)). As shown in Table 4.

**Discussion**

With the development of information technology, the economy, and the popularization of the Internet, mobile medical service has become a research hotspot in recent years (Wang & Dong, 2019). Due to its interactivity, convenience, and continuity, it has attracted the attention of scholars at home and abroad. Mobile medical is mainly the technical equipment that provides medical services and information by using mobile communication technology (Wang et al., 2017). As an important medium and carrier of mobile medical, the public platform based on WeChat has its own advantages in the prevention and treatment of chronic diseases. Combined with MUST education and nursing mode, it has achieved good results (Gao, Lu, et al., 2018).

This study found that the self-care ability score of the experimental group was higher than that of the control group 6 months after the intervention. It can be seen that the MUST education model with WeChat as the medium can promote the self-care of patients. The reason may be that WeChat combined with MUST health education.
model delivers self-management knowledge and information in a popular and understandable way, helping patients improve their knowledge level and complete the follow-up plan on time. Secondly, the form of doctor–patient WeChat group makes the traditional form of offline health education effectively switch to a new model of online and offline health education. In addition, the intervention program in this study also provides online advisory services with expert resources to achieve resource sharing and maximize the release of educational potential.

The improvement of self-management ability is the focus of the global multidisciplinary heart failure management program and plays an important role in patients with heart failure (Riegel et al., 2012); the necessity and professionalism of which has a very important impact on patients with heart failure. Both lacks of knowledge and cognitive misunderstandings can lead to insufficient self-management ability in patients with heart failure and affect disease outcome prognosis. Several studies have found that improving self-management ability can help patients to improve their quality of life and reduce death rates and readmission rates (Lee et al., 2018; Riegel et al., 2009). In China, patients with chronic heart failure lack disease-related skills, and there is still a lot of room for improvement in knowledge and self-care ability, and there is a positive correlation between self-care level and knowledge level (Tian et al., 2022). In this study, the level of heart failure knowledge in the experimental group was higher than that in the control group 6 months after the intervention; the incidence of cardiovascular events and readmission rate in the experimental group were lower than those in the control group. The reason for this may be that patients obtain the systematic knowledge source and skill guidance through WeChat as the medium, the content is simple and easy to understand, and the use of video, pictures, and text is conducive to patients' mastery and understanding; when patients have questions, they can seek help with the help area or contact medical staff; and through the daily reminder function, promote the interaction and continuity between doctors and patients to ensure the continuity of intervention so as to improve patients' self-care enthusiasm. At the same time, this study found that 6 months after the intervention, the quality of life score in the experimental group was higher than that in the control group, thus, the MUST nursing model with WeChat as the medium can improve the quality of life of patients, which may be due to the continuous nursing push of disease knowledge and self-care skills guidance with WeChat as the medium, improving the patient's disease cognition, so that the patient has a good self-care ability and profound understanding of their own disease, combined with the interactivity and continuous intervention of the platform, so as to achieve the uninterrupted continuous guidance and nursing of patients, which can make up for the shortcomings of the traditional nursing model, and then improve the quality of life of patients (Gao, Qi Sun, et al., 2018).

The limitations of this study are that due to the limitation of manpower, material resources, and financial resources, the sample size is small, the intervention measures are simple, the follow-up time is short, and the observation indicators are few. In the future study, the sample size can be appropriately increased, the follow-up time can be prolonged, and the laboratory observation indicators can be appropriately increased to provide the basis for the continuous improvement of the clinical nursing plan for patients with chronic heart failure. In addition, we should pay attention to the improvement of cardiac function by drug effect, and further strengthen the improvement of heart failure in patients by drug therapy and patient self-care treatment model in future studies.

In summary, the application of the MUST nursing intervention model in patients with chronic heart failure can effectively improve the self-care ability of patients, improve the knowledge level and quality of life of patients with heart failure, and reduce the readmission rate compared with the conventional cardiology nursing model, which has a good prospect of clinical application in China.

| group | Incidence of cardiovascular events | Readmission rate within 6 months |
|-------|----------------------------------|---------------------------------|
| Experimental group (n = 60) | 2 (3.33) | 4 (6.67) |
| Control group (n = 60) | 15 (25.00) | 20 (33.33) |

| \( \chi^2 \) | \( p \) |
|-------------|--------|
| 11.582      | .001   |

**TABLE 4** Comparison of incidence of cardiovascular events and readmission rate within 6 months between the two groups [n (%)]
of traditional Chinese Medicine, and informed consent was also obtained from all the patients (trial registration ID: researchregistry7453) (02/06/2020).

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