Am J Transl Res 2021;13(8):9306-9314
www.ajtr.org /ISSN:1943-8141/AJTR0128889

Original Article

Individual nursing promotes rehabilitation of patients with acute myocardial infarction complicated with arrhythmia

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Received December 23, 2020; Accepted February 23, 2021; Epub August 15, 2021; Published August 30, 2021

Abstract: Objective: This research is aimed at exploring the application effect of individual nursing on patients with acute myocardial infarction (AMI) complicated with arrhythmia. Methods: One hundred AMI patients complicated with arrhythmia admitted to the West China Hospital, Sichuan University from April 2018 to June 2020 were observed and researched. Among them, 47 (control group, CG) were given conventional nursing, and on this basis, 53 (experimental group, EG) were given individual nursing. The heart function, complications, negative emotions, exercise endurance, activities of daily living (ADL) and nursing satisfaction of the two groups were observed. Results: Compared with the CG, the incidence of complications in the EG was lower and the time of bed rest and hospitalization was shorter. After nursing, the heart rate (HR), left ventricular posterior wall thickness (LVWP), self-rating anxiety scale (SAS) and self-rating depression scale (SDS) scores of patients in both groups decreased, while the left ventricular ejection fraction (LVEF) and stroke volume (SV) scores increased. In addition, compared with the CG, the scores of HR, LVWP, SAS and SDS in the EG were lower while those of LVEF and SV were higher. The 6-minute walking distance and Barthel index (BI) of both groups increased after nursing, and scores in the EG increased most remarkably and were higher than in the CG. At last, research revealed that the overall nursing satisfaction of the EG was obviously better than that of the CG. Conclusion: An individual nursing mode can improve the physical condition, ADL and nursing satisfaction of patients, and reduce the incidence of negative emotions and complications.

Keywords: Acute myocardial infarction, arrhythmia, individual nursing, rehabilitation

Introduction

Acute myocardial infarction (AMI) is one of the most common sudden and serious diseases in human beings, it is mainly caused by a sudden interruption of the coronary blood supply or myocardial necrosis [1]. The elderly are a high-risk group of AMI complicated with arrhythmia. If they fail to get timely and effective treatment, AMI may develop into heart failure (HF), which is one of the main factors that reduce their ADL and cause high mortality [2]. It has been reported that the overall mortality of patients with cardiovascular diseases has declined in the past ten years, but about 17 million people still die from cardiovascular diseases every year, of which about 50% die from sudden cardiac death caused by ventricular arrhythmia [3]. Clinically, drugs are usually used for acute treatment of this disease [4]. While being hospitalized, patients still usually need a standardized and scientific nursing model to ensure treatment efficacy and improve their physical function, so as to promote rehabilitation [5].

With the progress of medical conditions, the requirements of inpatients for medical services are increasing, and the traditional nursing methods do not meet the nursing needs of all patients [6]. Individual nursing is a new nursing model developed on the basis of holistic nursing, which mainly embodies the higher realm of humanistic nursing and deepens the connotation of holistic nursing [7]. The clinical implementation of individual nursing is mainly patient-centered, providing targeted nursing intervention, and the fundamental purpose is to improve nursing quality, increase patients'

satisfaction with nursing quality and the hospital, and promote their rehabilitation [8]. Mello *et al*. claimed that individual nursing could help individuals heal and manage people who were troubled by long-term diseases and mental health problems [9]. While Zhang *et al.* thought that targeted nursing could improve the quality of life of systemic lupus erythematosus and reduce the complications of patients after standard treatment [10]. In some previous studies, although the application of individual nursing in various diseases was introduced [11, 12], the application effect of this mode in AMI patients complicated with arrhythmia is still vague.

In this research, we provide individual nursing for AMI patients complicated with arrhythmia, and observe the influence of this mode on the healing and recovery of patients.

Materials and methods

Data

This research was approved by the Ethics Committee of West China Hospital, Sichuan University. All patients and their families were informed in advance and were willing to participate in the research, and they signed the informed consent forms. One hundred AMI patients complicated with arrhythmia admitted to our hospital from April 2018 to June 2020 were observed and researched. Inclusion criteria: all patients were diagnosed with AMI complicated with arrhythmia [13]; the age was over 60 years old, and the cardiac function was classified as I-III. Exclusion criteria: those who had poor compliance and quit the experiment halfway; those who were seriously ill and could not tolerate examination; those complicated with severe cardiovascular and cerebrovascular diseases, malignancies, mental diseases, renal hepatic insufficiency, abnormal coagulation function and hematopoietic system diseases.

Nursing methods

One hundred patients were divided into control group (CG) (n=47) and experimental group (RG) (n=53). Patients in both groups were given conventional nursing, which included: monitoring of the vital signs, heart rate (HR) and rhythm of the patients regularly, notifying the attending doctor of any changes in the condition, and giving symptomatic treatment according to the doctor's advice. The nursing kept the sheets clean and tidy, disinfected and ventilated the room regularly. They advised patients to eat light and digestible food, and assisted them to urinate and defecate. Fifty-three patients (experimental group) were given individual nursing on the basis of conventional nursing. A research group was set up: the clinical data and educational background of patients were collected, and the nursing staff was trained. According to the patient's condition, the nursing workers with solid theoretical knowledge and rich working experience took the lead in the discussion to define the corresponding nursing intervention mode. Psychological nursing: The nursing staff actively communicated with patients and their families, eliminated their strangeness, guided their families to provide emotional support for patients and solved emotional problems. Furthermore, they also popularized disease knowledge to patients, explained the causes, treatment measures, precautions and adverse reactions, patiently answered any questions, and observed their emotional changes. Patients were encouraged to Read books, watch movies and TV, and listened to music to divert their attention. During the treatment of patients, the nursing staff were required to inform them the key points and precautions in the treatment process. Ward care: The nursing staff strengthened the number of ward visits, 3 times a day, and closely observed the changes of patients' vital signs; the number of patient visits was controlled (only 2), from 15:00 to 19:00 every day. There is no control over the number of times, only a specified period of time. This avoids the influence of noise and strong light, ensuring a good rest environment, and improves comfort and sleep quality. Strengthening of diet care: a standardized diet plan was formulated under the guidance of nutritionists in our hospital and the nursing staff did a good job in diet guidance; patients were allowed to eat more vegetables, fruits, low-fat and low-salt foods, with many meals but little food at each; they were advised not to eat spicy, greasy and other irritating foods, thus maintaining good eating habits. Electrocardiogram and risk management nursing: The nursing staff used strict operations of the flow of electrocardiogram, the P-QRS-T waveform were clear, and the alarm

device for arrhythmia was set to identify abnormal situations. They prepared amiodarone, defibrillators and other drugs and rescue equipment, so as to give timely treatment when serious complications such as ventricular fibrillation occurred. Nursing for monitoring physical signs: The nursing staff were obliged to closely observe the patient's consciousness, complexion, pain and adverse drug reactions, and observe the nature, location and duration of pain. When using antiarrhythmic drugs, they strictly followed the doctor's advice and mastered the concentration, dosage and treatment speed of the drugs. Rehabilitation nursing: According to the ECG changes of patients, the nursing staff guided patients to exercise properly, such as passive joint movement, bedside standing, walking, going up and down stairs, etc. When the patient's physical condition is improved, their physical strength and tolerance were combined to appropriately increase the amount of exercise, and the limb function and ADL were trained.

Outcome measures

The clinical data of patients were collected, and the cardiac function indexes were monitored, including HR, left ventricular posterior wall thickness (LVWP), left ventricular ejection fraction (LVEF) and stroke volume (SV). The time of bed rest and hospitalization of patients were observed, and the complications including pressure ulcers, cardiogenic shock and HF were observed. Patients' negative emotions were evaluated by the Self-rating anxiety scale (SAS) and the self-rating depression scale (SDS) [14]. They included 20 symptoms, and the frequency of symptoms was assessed. A total score below 50 points was normal, 50-60 was mild, 61-70 was moderate, and 70 or more were severe. The higher the score, the more serious the symptoms in this area are. Patients' exercise endurance and walking at a daily pace were tested through the 6-minute walking distance [15], turning around and back at the end point of 30 meters, and stopping after 6 min. If the patient had dizziness, chest pain, fatigue and other symptoms, the experiment was stopped immediately. Patients' ADL was analyzed via the BI [16], 100 points in total: 60 points indicated capable of living independently, 60-40 indicated needs help, and 40-20 indicated needs great help. The higher the score, the better the patient's ADL is. The nursing satisfaction of patients in both groups was investigated via the nursing satisfaction questionnaire [17] made by the hospital, with a total score of 100 points: >90 was very satisfied, 60-90 was satisfied, and <60 was dissatisfied. The higher the score, the better the patient's satisfaction with this nursing intervention is.

Statistical methods

The counting data were expressed by [n (%)] and compared by Chi-square test. When the theoretical frequency was less than 5, Fisher exact probability method was adopted. The measurement data was displayed by (mean ± SEM) and compared by t-test, while paired t-test was used for comparison before and after nursing. The experimental data were analyzed by SPSS 25.0 (IBM, Armonk, NY, United States). $P<0.05$ indicated a statistical difference.

Results

Clinical data of patients in CG and EG

We collected the clinical data of patients in the CG and the EG. The results revealed that there was no marked difference in age, course of disease, gender, place of residence and body mass index (BMI) between both groups ($P>0.05$) (**Table 1**).

Cardiac function indexes of patients in CG and EG

We observed the HR, LVWP, LVEF and SV scores of patients in the CG and EG. Before nursing, all the scores of both groups had no marked changes ($P>0.05$). Before nursing, the HR, LVWP, LVEF and SV of patients in the CG were (117.59±10.12) min, (18.85±4.12) mm, (31.86±6.35)% and (55.63±4.95) mL, while those were (107.63±6.15) min, (13.46±3.21) mm, (40.23±7.36)%, (74.49±5.49) mL after nursing, respectively. The HR, LVWP, LVEF and SV of patients in the EG before nursing were (116.63±10.38) min, (18.77±4.36) mm, (31.54±6.42)%, and (54.26±4.97) mL, while those after nursing were (95.63±7.63) min, (10.35±3.03) mm, (45.63±8.52)%, (80.02±5.86) mL, respectively. However, after nursing, the HR and LVWP scores decreased, while the LVEF and SV scores increased ($P<0.001$). In addition, the HR and LVWP scores in the EG

Table 1. Clinical data of patients in CG and EG

Clinical data	Control group (n=47)	Experimental group (n=53)	χ^2/t	P
Age (years)	67.25±3.55	67.89±3.97		
Course of disease (weeks)	1.67±0.13	1.63±0.14		
Gender			0.148	0.701
Male	31 (65.96)	33 (62.26)		
Female	16 (34.04)	20 (37.74)		
Place of residence			0.281	0.596
Cities	40 (85.11)	47 (88.68)		
Countryside	7 (14.89)	6 (11.32)		
BMI (kg/m^2)	23.02±4.51	23.18±4.49		
Types of arrhythmia			0.090	0.764
Tachyarrhythmia	37 (78.72)	43 (81.13)		
Brady arrhythmia	10 (21.28)	10 (18.87)		
Diseased parts			0.204	0.977
Extensive anterior wall	20 (42.55)	21 (39.62)		
Inferior wall	11 (23.40)	12 (22.64)		
Antero-septal	7 (14.89)	8 (15.09)		
Posterior wall	9 (19.15)	12 (22.64)		
History of smoking			0.623	0.430
Yes	25 (53.19)	24 (45.28)		
No	22 (46.81)	29 (54.72)		
History of drinking			0.107	0.743
Yes	29 (61.70)	31 (58.49)		
No	18 (38.30)	22 (41.51)		

were lower than those in the CG (P<0.001), while the LVEF and SV scores were higher (P<0.01) (**Figure 1**).

Emotional scores of patients in CG and EG

The anxiety and depression of patients were assessed via SAS and SDS scores. Before nursing, there was no remarkable difference between the CG and the EG (P>0.05). After nursing, the two scores decreased (P<0.001), and the scores in the EG were lower than those in the CG (P<0.001) (**Figure 2**).

Incidence of complications in CG and EG

We observed the complications of both groups of patients during nursing. The SAS and SDS scores of patients in the control group were (73.15±6.01), (64.63±5.84) before nursing and (60.48±5.59), (50.47±4.69) after nursing. The two scores of patients in the EG were (74.96±5.69), (65.75±5.38) before nursing and (53.36±5.63), (42.36±4.63) after nursing. In the CG, there were 3 cases of pressure ulcers, 2 cases of cardiogenic shock and 9 cases of HF, and the complication rate was 29.79%. In the EG, there was 1 case of pressure ulcer, 1 case of cardiogenic shock and 4 cases of HF, and the rate was 11.32%. The incidence of complications in the EG was lower than that in the CG (P<0.05) (**Table 2**).

Time of bed rest and hospitalization of patients in CG and EG

We assessed the time of bed rest and hospitalization of patients in the CG and the EG. The duration of bed rest and hospitalization in the CG were (4.6±0.7) d, (14.9±1.7) d respectively. The time of bed rest and hospitalization of patients in the EG were (3.1±0.5) d, (12.8±1.3) d respectively. Statistical analysis revealed that the time in the EG was shorter than that in the CG (P<0.001) (**Figure 3**).

Exercise endurance and ADL of patients in CG and EG

The exercise endurance and ADL of both groups of patients were analyzed via the 6-minute walking distance and the BI. Before nursing, the 6-minute walking distance and BI of patients in the CG were (261.63±32.15) m, (38.42±3.41) and 279.02±35.92) m, (70.54±5.63), respectively. While the 6-minute walking distance and BI of patients in the EG were (255.47±30.53) m, (37.49±3.05) before nursing and (298.23±38.17) m, (78.45±6.28) after nursing. Before nursing, there was no marked difference between the two groups (P>0.05). After nursing, the 6-minute walking distance and BI increased (P<0.001), especially in the EG, which was higher than that in the CG (P<0.05) (**Figure 4**).

Nursing satisfaction of patients in CG and EG

The nursing satisfaction of both groups of patients was investigated. The results revealed that after nursing, 21 patients in the CG were very satisfied (44.68%), 18 were satisfied (38.30%), 8 were dissatisfied (17.02%), and

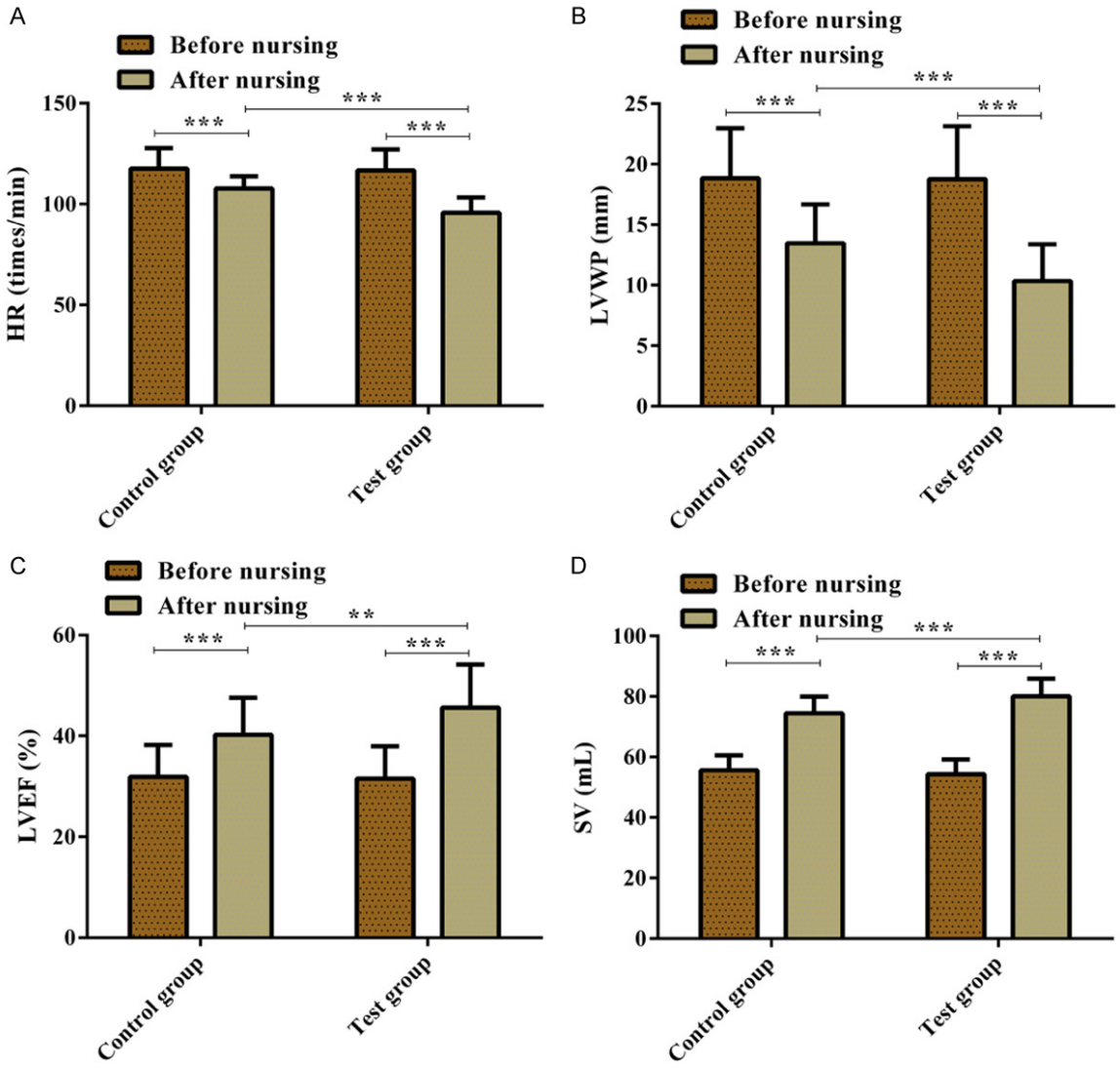

Figure 1. Comparison of cardiac function indexes between CG and EG. After nursing, the HR (A) and LVWP (B) scores of patients in both groups decreased, while the LVEF (C) and SV (D) scores increased. Compared with patients in the CG, the HR and LVWP scores of patients in the EG decreased, while the LVEF and SV scores increased. Note: **P<0.01; ***P<0.001.

the nursing satisfaction was 82.98%. While in the EG, 28 were very satisfied (52.83%), 23 were satisfied (43.40%), 2 were dissatisfied (3.77%), and the nursing satisfaction was 96.23%. The overall nursing satisfaction of patients in the EG was obviously better than that in the CG (P<0.05) (**Table 3**).

Discussion

Drugs are generally used in clinical treatment for elderly AMI patients complicated with arrhythmia, but the efficacy is not ideal. In order to promote the early recovery of patients, targeted nursing measures should be taken according to their actual situation [18]. In this research, we provided individual nursing for AMI patients complicated with arrhythmia. The results revealed that individual nursing could improve patients' heart function, exercise endurance, ADL and nursing satisfaction, and reduce the incidence of negative emotions and complications. This shows that the individual nursing mode is effective in promoting the rehabilitation of patients.

Conventional nursing is passive in clinical practice, which is usually the nursing scheme adopt-

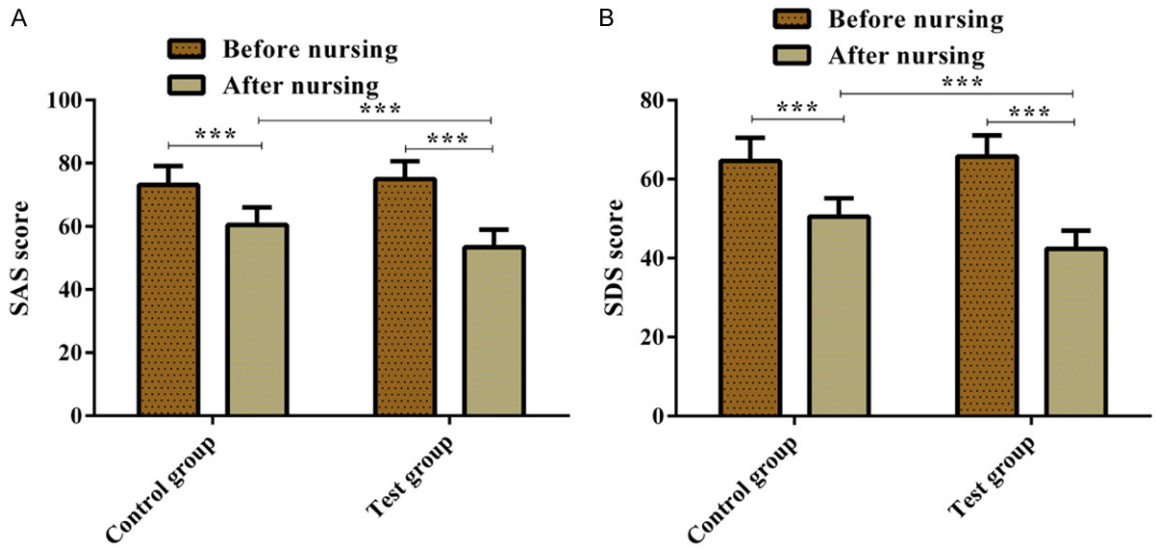

Figure 2. SAS and SDS scores of patients in CG and EG. After nursing, the scores of SAS (A) and SDS (B) of patients in both groups decreased, and the scores in the EG are lower than those in the CG. Note: ***P<0.001.

Table 2. Incidence of complications in CG and EG

Complications	Control group (n=47)	Experimental group (n=53)	χ^2	P
Pressure ulcer	3 (6.38)	1 (1.89)	0.402	0.526
Cardiogenic shock	2 (4.26)	1 (1.89)	0.011	0.916
Heart failure	9 (19.15)	4 (7.55)	2.965	0.085
Incidence rate (%)	29.79	11.32	5.309	0.021

ed by patients after complications or adverse reactions [19]. The core theme of individual nursing is that it is people-oriented, embodying humanistic care, actively formulating professional and targeted nursing for patients, and breaking the passive nursing mode [20]. Before implementing nursing intervention, we require nursing staff to make a scientific and rational nursing plan according to patients' conditions, and evaluate it in light of their needs and disease risks, so as to help the nursing staff have a clear understanding of nursing content. Most AMI patients complicated with arrhythmia lack the knowledge of illness, and diseases and complications may bring about negative emotions such as anxiety and depression [21]. We give psychological guidance to them, and the results manifest that individual nursing can improve patients' anxiety and depression. França *et al.* explained that communication was an effective nursing method for cancer in children based on a humanistic nursing theory, which was extremely important for promoting palliative care [22]. Therefore, active communication with patients and correct psychological counseling can not only enhance patients' knowledge of diseases, but also encourage them to actively cooperate with treatment. We also implemented ward nursing, diet administration, electrocardiogram and risk management for patients. Compared with conventional nursing, patients' heart function, bed rest time, exercise endurance and ADL have been improved obviously. Although there is no statistical difference in the incidence of some complications such as pressure ulcers, cardiogenic shock and HF, the total incidence has been obviously reduced. Similar to our research, Lau-Walker *et al.* found that the introduction of a personalized patient education protocol successfully improved the participation of myocardial infarction patients. Patient-centered services were promoted by enabling practitioners to systematically provide personalized patient education and provide patients with post-discharge structures to better follow up on the disease concerns of health care professionals [23]. In the nursing process, we strengthened the condition monitoring and ECG detection, which helps avoid the risk inducement of complications and reduces the occurrence of cardiogenic shock, arrhythmia and other complications. Patients' living habits and attitudes can be improved after strength-

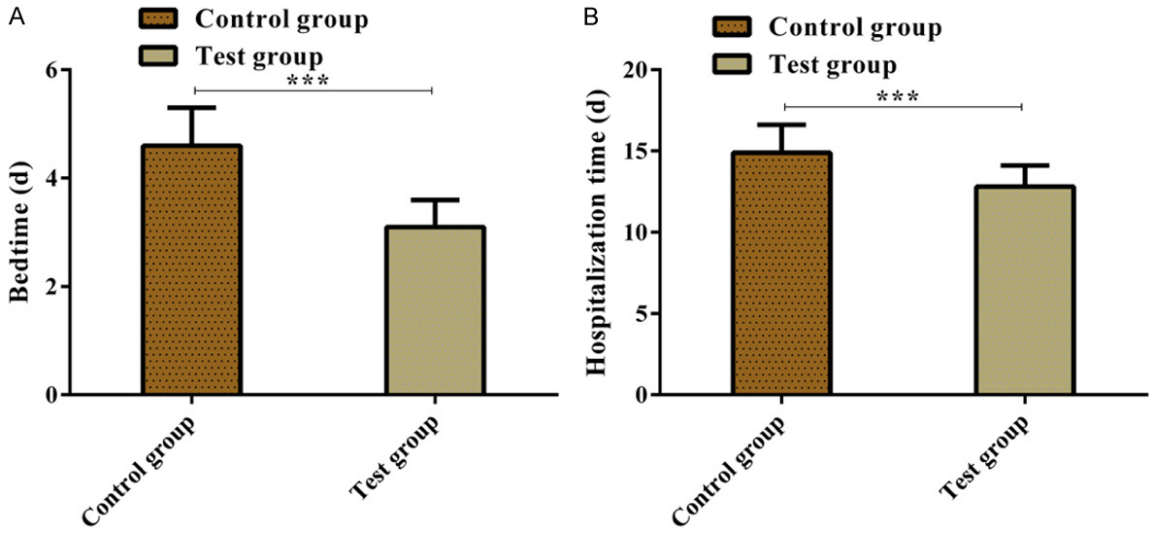

Figure 3. Comparison of time of bed rest and hospitalization between CG and EG. The time of bed rest (A) and hospitalization (B) of patients in the EG is shorter than that in the CG. Note: ***P<0.001.

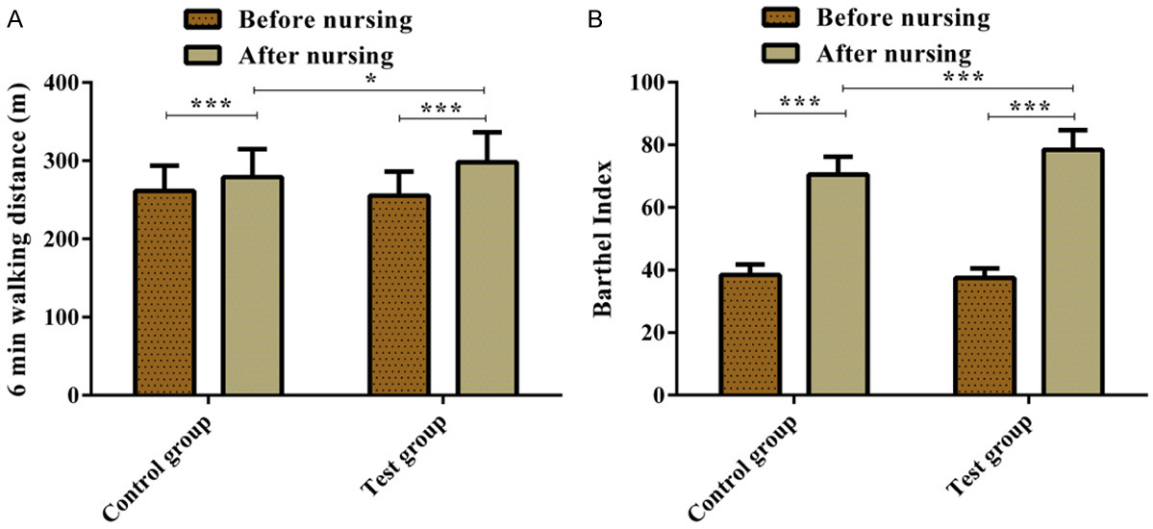

Figure 4. 6-minute walking distance and BI of patients in CG and EG. After nursing, the 6-minute walking distance (A) and BI (B) of patients in the two groups increased, especially in the EG, which is higher than that in the CG. Note: *P<0.05; ***P<0.001.

Table 3. Nursing satisfaction of patients in CG and EG

Nursing satisfaction	Control group (n=47)	Experimental group (n=53)	χ^2	P
Very satisfied	21 (44.68)	28 (52.83)	-	-
Satisfied	18 (38.30)	23 (43.40)	-	-
Dissatisfied	8 (17.02)	2 (3.77)	-	-
Satisfaction (%)	82.98	96.23	4.857	0.028

ening postoperative rehabilitation training, thus improving exercise endurance and ADL, and promoting disease recovery. Finally, our research revealed that the hospitalization time of patients was obviously less, and the overall nursing satisfaction was improved. This represents the nursing mode, which can not only reduce the economic burden of patients during hospitalization, but also has high recognition. Li *et al.* confirmed that the application of clinical nursing approach in patients with acute cerebral

hemorrhage improved the clinical efficacy and nursing satisfaction, and reduced the adverse reactions [24]. Clinical nursing approach is mainly aimed at applying nursing services to patients in the form of charts, which is different from personalized nursing concepts.

Although our research shows that individual nursing has a good effect in AMI patients complicated with arrhythmia, there are still some limitations. Firstly, the long-term quality of life of patients has not been observed. Secondly, the application effect of this nursing model in diabetes, stroke and other diseases that affect the elderly has not been deeply understood. These need to be further supplemented in future research.

In summary, applying an individual nursing mode to AMI patients complicated with arrhythmia can improve their physical condition, ADL and nursing satisfaction, and reduce the incidence of negative emotions and complications.

Disclosure of conflict of interest

None.

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