Influence of Continuous Nursing on the Psychological State and Coping Style of Patients Undergoing Pacemaker Implantation

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Abstract

Background: Patients undergoing pacemaker implantation often experience anxiety and fear. As such, studies have focused on the mechanisms that relieve the negative emotions caused by the intervention. Continuous nursing is a safe and effective nursing mode. In this study, continuous nursing intervention was provided for elderly patients undergoing pacemaker implantation and an empirical investigation was performed to determine the effects of their negative emotion and disease-coping ability.

Methods: Overall, 114 (68 males and 46 females) elderly patients who were undergoing pacemaker implantation from Harbin City (China), were enrolled in the study. The patients were divided into two groups, namely, the control group and the intervention group, based on different nursing methods. Routine nursing was applied to the control group; continuous nursing support was provided for the intervention group from January 2014 to January 2015. The nursing results of the two groups were compared. These results were also evaluated using self-rating depression scale, self-rating anxiety scale, and trait coping style questionnaire.

Result: The effects of depression and anxiety intervention were significant in the intervention group ($P<0.05$). Compared with the control group, the intervention group did not significantly differ. The coping style of the intervention group elicited significant effects. Compared with the control group, the intervention group was significantly different ($P < 0.05$).

Conclusion: Continuous nursing can relieve the negative emotion and improve the negative coping style of patients undergoing pacemaker implantation.

Keywords: Continuous nursing, Psychological state, Coping style, Pacemaker implantation

Introduction

Continuous nursing is a new nursing service mode that emerged with changes in social development and medical treatments. Hospitalization nursing extends to treatment and rehabilitation after patients leave hospitals to help improve patient self-management and ensure that information, treatment, and nursing services continue without interruption (1, 2). Studies on the continuous nursing

of Total Hip Arthroplasty (THA) patients have been extensively conducted. The management of patient symptoms, assessment, rehabilitation exercise, and psychological functions are key measures of the continuous nursing of THA patients (3). Preoperative health education could play an effective role in reducing pain levels, recovering functions, improving satisfaction and quality of life,

and shortening hospital stay (4, 5). Post-discharge telephone following up and physical condition assessment; significantly affect the physical condition of elderly THA patients (6). Studies on continuous nursing, such as the application of continuous nursing for elderly patients with hip fracture (7) and allergic asthma (8), have increased gradually in China. Zhang et al. (9) comparatively studied 60 patients undergoing radical mastectomy and found that the positive coping (PC) score of the patients who received continuous nursing was significantly higher than that of the control group. Moreover, the negative coping (NC) score of the patients with continuous nursing was significantly lower than that of the control group ($P < 0.05$). Continuous nursing is a safe and effective nursing mode and this mode can effectively improve the nutrition, movement, pharmaceutical administration, and complication management behavior of patients.

Cardiac pacemaker implantation is a safe and effective method to treat cardiac pacing conduction dysfunction and severe chronic arrhythmia. Studies on evidence-based medicine have revealed that pacemakers have been extensively used in clinical applications with the development of pace-making theory and progress of pace-making technology. In particular, Cardiac Resynchronization therapy (CRT) pacemaker technology has become one of the conventional means to treat patients with severe cardiac failure (10). As population aging becomes severe, an increasing number of elderly patients undergo permanent cardiac pacemaker implantation. Among patients undergoing pacemaker implantation, the proportion of elderly patients aged >65 years reaches 70% to 80% (11). Patients often experience anxiety and fear because these patients do not understand pacemaker implantation or show doubts regarding operations. The unhealthy psychological statuses directly influence disease development and quality of life (12). The proportion of patients who experience pacemaker implantation and show anxiety symptoms reached 40.27% (13).

In China, current medical services are mostly limited in hospitals. As patients leave hospitals, the medical service relationship between doctors and patients also ends. Elderly patients lose the guidance of medical workers; as such, these patients desire to obtain rehabilitation guidance and psychological support after they leave hospitals. However, this condition is particularly difficult for Chinese families under the family planning policy. These families only have one child, but elderly patients require extensive nursing and care (14).

In our study, continuous nursing intervention was provided for elderly patients undergoing pacemaker implantation, so an empirical investigation was performed to determine the effects of negative emotion and the disease-coping ability of elderly patients.

Materials and Methods

Overall, 114 (68 males and 46 females) elderly patients undergoing pacemaker implantation, were selected as the subjects in the Second Affiliated Hospital of Harbin Medical University in China from January 2013 to January 2014. The average age was 68.2 ± 8.5 years. All of the patients exhibited a stable disease state and did not show any infection or guide line dislocation. All of the patients also exhibited independent reading and comprehension abilities. Those patients with acute myocardial infarction, cardiac surgery, pulmonary embolism, psychiatric disorders, and cancer history were excluded of the study.

The inclusion criteria (15) were as follows: 1) patients undergoing pacemaker implantation; 2) aged 60 years or older; 3) educational level above primary school and independent reading ability; 4) sane and able to communicate; 5) willing to accept continuous nursing services and participate in this study; 6) have communication equipment and ensure smooth information communication. The exclusion criteria (15) were as follows: 1) infection or guideline dislocation; 2) acute myocardial infarction, cardiac surgery, acute cerebral infarction, and other severe diseases; 3) postoperative death.

The minimum imbalance index method was adopted to divide the 114 elderly patients into the intervention (57 patients) and control (57 patients) groups. Gender, age, and cardiac function grading were used as the basis for grouping. The differ-

ences of the 2 groups in the aforementioned 3 factors were kept minimum to the largest extent.

Research tools

1) Self-Rating Depression Scale (SDS): Zung's SDS (16) was applied. This scale consists of 20 items, including 10 negative symptoms and 10 positive symptoms. Each question represents a feature of depression. All items together can reflect the mood, body discomfort symptoms, spiritual movement, behavior, and psychological symptoms of patients with depression. The score involves 4 grades. The scores were obtained using the scoring method in ascending order (1 to 4) based on the occurrence frequency of positive symptoms. The rough scores were obtained using the reverse scoring method in ascending order (4 to 1) based on the occurrence frequency of negative symptoms. The standard score was obtained by multiplying the scores by 1.25 and rounding off. Normally, the upper limit score is 41 and the standard total score is 53. A higher score indicates a more significant depression tendency. Depression severity = accumulative score of each item/80. Grade description: ≤0.5 means no depression; 0.5 to 0.59 means slight–mild depression; 0.6 to 0.69 medium–severe depression; ≥0.7 means severe depression (17).

2) Self-Rating Anxiety Scale (SAS): Zung's SAS (18) was applied. This scale mainly evaluates the subjective feeling of anxiety of the patients and is a self-evaluation tool. The SAS is extensively applied in clinics and characterized by high reliability and validity. Fifteen items are stated with negative words. The scores were obtained using the scoring method in ascending order (1 to 4) based on the occurrence frequency of symptoms. Five items [5, 9, 13, 17, and 19] are stated with positive words. The scores were obtained using the reverse scoring method in ascending order (4 to 1) based on the occurrence frequency of symptoms. The total score was obtained by adding the scores of all items. The standard score was obtained by multiplying the total score by 1.25 and rounding off. The mean value of the standard score is 50. Grade description: <50 means normal; 50 to 59 means

mild anxiety; 60 to 69 means medium anxiety; ≥70 means severe anxiety (17).

3) Trait Coping Style Questionnaire (TcsQ): The TcsQ was prepared and revised by Jiang and Zhu (19). The TcsQ has 2 subscales, namely, NC and PC, involving 10 items, respectively. The grade scoring of 1 to 5 was adopted (1, certainly not; 2, possibly not; 3, uncertain; 4, maybe; 5, certainty is). Cronbach's coefficients of NC and PC are 0.69 and 0.70, respectively. Retest coefficients of NC and PC with an interval of 4 weeks are 0.75 and 0.65, respectively. The questionnaire has good reliability and validity. The TcsQ is a classic coping scale in China. In this study, the internal consistency coefficients of the 2 subscales are 0.63 and 0.66.

Intervention method

1) Control group: Routine medical care was given to the control group during hospitalization. When the patients were admitted to the hospital, the self-rating scales for ordinary information, trait coping style of patients, and anxiety and depression were completed. Based on the survey results and main problems, the chief doctor explained disease-related knowledge and the operation process to the patients. The nursing personnel publicized diet knowledge, recovery knowledge, preoperative preparation, intraoperative cooperation and postoperative notes, and measured mastery of relevant contents. Patients with severe emotional disorder were given individual psychological intervention.

2) Intervention group: 1) Except for routine medical treatment and nursing during hospitalization, the first investigation result was assessed to determine the causes of anxiety or depression. Then, psychological intervention was conducted in allusion to the causes to eliminate the worries of patients and enhance their confidence in medical workers. 2) Continuous nursing intervention contact card was issued during hospital discharge. The contents of the contact card include the basic information of the patients, attending doctor, primary nurse, head of department, name and phone number of the head of department; discharge summary; medicine usage, dosage, and course of

treatment; reexamination time arrangement; and guidance of healthy lifestyle. 3) Phone or SMS follow-up of patients was conducted in the second week, fourth week, and every month after hospital discharge. 4) Patients undergoing cardiac pacemaker implantation participated in friendship activities and communicated after hospital discharge for one year.

Statistical approach

SPSS 15.0 statistical software (Chicago, IL, USA) was applied to analyze data. Theorem information was expressed as the mean ± standard deviation. Independent-samples *t*-test was adopted for intergroup comparison, whereas paired *t*-test was adopted for intragroup comparison of the means of the two groups. Case number and constituent ratio were used to express the qualitative data. Intergroup comparison of disordered categorical data was conducted using chi-square test and Fisher's exact probability. Intergroup comparison of ordered data was conducted using the Wilcoxon rank sum test. $P < 0.05$ indicates that the difference was statistically significant.

Ethical principles

This study was approved by the Ethics Committee of the hospital. We obtained the informed consent of the objects in the survey to assure them of their right to privacy and to ensure that confidential information is not compromised.

Results

Comparison of ordinary information

At the end of the follow-up visit, 3 study objects in the intervention group were excluded, i.e., 2 patients actively quitted and 1 patient died. As such, 54 patients were actually investigated. At the end of the follow-up visit, 8 study objects in the control group were excluded, i.e., 4 patients actively quitted, 2 patients could not persist because of complications, and 2 patients died. As such, 49 patients were investigated. The patients in both groups had no significant difference in terms of gender, age, educational level, medical expense, cardiac function grading, live alone, and household economic condition (Table 1). As such, these patients were comparable ($P > 0.05$).

Table 1: Comparison of basic information

Variable		Intervention group n (%)	Control group n (%)	t/Z/χ^2	*P* value
Gender	Male	34 (63)	30 (61.2)	χ^2=0.033	0.856
	Female	20 (37)	19 (38.8)		
Age (yr)		68.4 ± 8.5	67.7 ± 8.1	*t*=0.427	0.670
Educational level	Junior high school and below	21 (38.9)	18 (36.7)		
	Senior high school or technical secondary school	22 (40.7)	19 (38.8)	Z=0.396	0.692
	University	11 (20.4)	12 (24.5)		
Medical expense	Urban medical insurance	30 (55.6)	29 (59.2)		
	New rural cooperative medical system	20 (37)	18 (36.7)	χ^2=0.559	0.851
	At one's own expense	4 (7.4)	2 (4.1)		
Cardiac function grading	I	17 (31.5)	15 (30.6)		
	II	25 (46.3)	24 (49)	Z=0.035	0.972
	III	14 (25.9)	14 (28.6)		
	IV	8 (14.8)	6 (12.2)		
Whether to live alone	Live alone	4 (7.4)	3 (6.1)		
	Live with spouse	21 (38.9)	21 (42.9)	χ^2=0.268	0.952
	Live with children	29 (53.7)	25 (51.0)		
Household economic condition	Poor	3 (5.6)	4 (8.2)		
	Relatively poor	5 (9.3)	4 (8.2)		
	General	22 (40.7)	21 (42.9)	χ^2=0.417	0.677
	Favorable	14 (25.9)	12 (24.5)		
	Good	10 (18.5)	8 (16.3)		

Comparison of psychological state before and after nursing intervention

The difference of the SAS and SDS scores of the two groups before intervention was not statistically significant. After intervention, the SAS and SDS scores of the intervention group decreased significantly. Compared with the scores before intervention, the scores after the intervention were significantly different ($P < 0.05$). Although the SAS and SDS scores of the control group de-creased slightly, the difference was not statistically significant compared with the scores before intervention. Based on the SAS and SDS scores of the two groups after intervention and the change value before and after intervention, we found that the intervention effect of the intervention group was significant. Compared with the control group, the intervention group was significantly different ($P < 0.05$), as shown in Table 2.

Table 2: Comparison of psychological state before and after nursing intervention

Group	SAS			SDS		
	Before intervention	After intervention	*D* value	Before intervention	After intervention	*D* value
Intervention group ($n = 54$)	44.5 ± 9.2	35.2 ± 7.8*	9.3 ± 7.2	48.6 ± 11.4	39.3 ± 8.9*	9.3 ± 8.1
Control group ($n = 49$)	43.9 ± 8.9	41.6 ± 7.8	2.3 ± 7.1	48.1 ± 11.5	46.9 ± 9.2	1.2 ± 8.3
T value	0.285	4.176	4.908	0.208	4.241	4.981
P value	0.776	<0.001	<0.001	0.836	<0.001	<0.001

Note: *$P < 0.001$, compared with before intervention

Comparison of coping style before and after nursing intervention

Before intervention, the difference of the PC and NC scores was not statistically significant. After intervention, the PC score of the intervention group increased significantly, whereas the NC score decreased significantly. The difference was statistically significant compared with before intervention ($P < 0.05$). Although the PC and NC scores of the control group changed slightly, the difference was not statistically significant compared with before intervention. In addition, based on the PC and NC scores of the two groups after intervention and the change value before and after intervention, the intervention effect of the intervention group is significant. Compared with the control group, the intervention group was significantly different ($P < 0.05$) (Table 3).

Table 3: Comparison of coping style before and after nursing intervention

Group	Positive coping			Negative coping		
	Before intervention	After intervention	*D* value	Before intervention	After intervention	*D* value
Intervention group ($n = 54$)	33.3 ± 6.9	39.8 ± 6.4*	6.5 ± 6.8	37.6 ± 6.8	29.6 ± 7.6*	8.0 ± 6.9
Control group ($n = 49$)	32.8 ± 6.7	33.9 ± 7.1	1.1 ± 6.9	38.2 ± 7.2	36.9 ± 6.7	1.3 ± 7.0
T value	0.372	4.436	3.997	0.435	5.149	4.888
P value	0.710	<0.001	<0.001	0.665	0.000	<0.001

Note: * $P < 0.001$, compared with before intervention

Discussions

With the development of the medical and nursing modes in 1940s and based on the concept of "integrated person," patients as "an integrated person" started to receive extensive medical and nursing attention. Professionals gradually realized that the hospitalization process of patients is only a part of the entire nursing process. Thus, continuous nursing service between hospital and family expands nursing service.

In this study, a series of continuous nursing services were provided for elderly patients undergoing pacemaker implantation to improve their anxiety and depression symptoms significantly. Table 2 shows that, after the patients underwent pacemaker implantation, the SAS scores increased significantly, whereas the scores of anxiety and depression moods decreased significantly. The difference was statistically significant. The result is consistent with Liang and Zheng study (20), in which targeted nursing intervention was adopted for patients undergoing pacemaker implantation to relieve their anxiety and depression and improve their quality of life significantly. Before the elderly patients underwent pacemaker implantation, they often suffer from multiple diseases. Long-term drug treatment leads to increasing poor effects. The patients hope to achieve better effects through cardiac pacemaker implantation. However, the patients experience different degrees of anxiety because they worry about operation failure and postoperative complications (21).

In the clinical care process, the intervention effect in allusion to the causes of anxiety and depression is most significant. The workload of ineffective psychological intervention decreases, and nurse–patient relationship can be enhanced. Moreover, the anxiety symptoms of the patient can be relieved effectively (20). Meanwhile, the correct selection of intervention opportunities can boost the psychological intervention effect. In this study, we observed that patients who are hospitalized mostly need health education, which is a good opportunity. All investigations, publicity, and education should be conducted when the disease state and mood of the patients allow. Patients with anxiety are in a state of irritability, such that emotion and intonation mildness are required during communication with them to avoid a hostile mood that will affect follow-up communication and to avert incorrect investigation results because of their subjective factor. In the process of diagnosis and treatment, the major reasons for anxiety should be evaluated and intervened in time. If the negative emotion results from the long-term disease state, then the primary goal of intervention is to improve the cardinal symptoms and comfort levels of the patients. If patients are anxious because they lack knowledge about their disease and have doubts about the therapeutic effect, then arranging for attending doctors to communicate with patients as soon as possible and explain the pacemaker implantation process and effects is required. If necessary, other similar patients may be invited to share their personal experience to enhance persuasion. For some patients with poor economic condition, primary nurses should actively explain medical insurance policy and state clearly the approximate surgery cost, particularly the expense that the patients need to undertake, to help them a better grasp of treatment cost and time. Furthermore, for elderly patients, communication should be based on accurate patient assessment and flexible and diversified modes should be adopted because of their age, disease type, and long-term mindset. The contents should be simple, concise, and easy to understand. In case of communication barriers, the nursing personnel should calm down and reassess the needs and problems of the patients. Problem solving in allusion to the root can achieve good effects. The rehabilitation process of the patients can proceed by steps and their anxiety mood can significantly improve.

Continuous nursing service not only aims to treat disease symptoms but also involves physical and psychological rehabilitation of patients (22). The biological factors of the disease and the psychological, mental, environmental, and social factors should be used to assess the recovery of the patients. Moreover, intervening measures should be taken in allusion to multiple aspects to improve the disease-coping ability of elderly patients. In this study, continuous nursing intervention is pro-

vided for elderly patients undergoing pacemaker implantation, which significantly improves their disease-coping ability.

In this study, continuous and individual nursing for confidence support and psychological support was provided for patients. Psychological support contributes to enhancing the subjective initiative and self-control ability of patients, meeting the safety and comfort needs of patients in the special state, relieving the negative mentality of patients, eliminating the worries of patients, helping the patients maintain the best physical and psychological states, and boosting the mental adaptive ability and self-esteem level of patients. Zhou et al. (23) indicated that psychological nursing plays an important role in alleviating ideological worry, improving operation safety, reducing postoperative pains, and boosting patient satisfaction. A series of practices, such as issuing the contact card of primary nurses after hospital discharge, phone or SMS follow-up, and participation in communication with other similar patients, is classified as information support. Information support can provide guidance, suggestion, and consultation for patients in the stressed state, increase their knowledge, master the methods to resist bad moods, promote body recovery ability, improve self-protection ability, ensure healthy patient behavior from passive reception of treatment and nursing, and boost the ability of patients to cope with diseases (24). In the follow-up visit process, propaganda and education of essential knowledge, such as disease knowledge and self-help methods, can be provided. Knowing the psychological state, pacemaker operation stage, and relevant problems of the patients is necessary, such that professional guidance and psychological counseling can be provided in time to reduce complications in the recovery period, boost patient cognition of the disease and self-care awareness, lighten the pressure on their family members, enhance their confidence and sense of safety, and improve their quality of life. Effective improvement of the somatic symptoms of patients, mastery of pacemaker-related knowledge, support from the relatives of patients, and social support can help relieve the fear and worry, recover the social functions, and boost the disease-coping capacity of patients.

With the continuous acceleration of aging, continuous improvement of the living standards of residents, and changes in lifestyle in China, morbidity of cardiovascular disease presents a significantly increasing trend (25). For elderly patients undergoing pacemaker implantation, they need to maintain basic bodily functions and prolong their life span. More importantly, they need to reduce various mental negative moods and improve quality of life and disease-coping capacity to achieve a satisfying health state (26, 27). China is a developing country. As such, the expense for pacemaker implantation is a large sum of money for most common workers or farmers, which leads to significant mental and economic burden for the patients. Meanwhile, influenced by the family planning policy, many elderly people cannot obtain timely care from their children. Therefore, establishing continuous service modes for patients undergoing pacemaker implantation is necessary.

This study has several limitations. The reexamination rate of long-distance patients is low because of health state, traffic fee, or incomplete cognition. The disease types investigated are few, and the data obtained are incomplete. Considering the limitations of heavy workload and insufficient workers, only elderly patients undergoing pacemaker implantation are investigated at present. Thus, the continuous service data obtained cannot represent all patients.

Conclusion

The results of this study show that elderly patients have relatively severe depression and anxiety before and after pacemaker implantation. After continuous health care service was provided, the depression and anxiety levels of these elderly patients decreased significantly. However, correct grasp of intervention methods and time is the key to ensure significant intervention effects.

Ethical considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or fal-

sification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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