



A health education booklet and telephone follow-ups can improve medication adherence, health-related quality of life, and psychological status of patients with heart failure



Mingming Yu, PhD, RN^{a,*}, Sek Ying Chair, PhD, RN^b, Carmen W.H. Chan, PhD, RN^b, Kai Chow Choi, PhD^b

^a School of Nursing, Peking Union Medical College, Beijing, PR China

^b The Nethersole School of Nursing, The Chinese University of Hong Kong, Shatin, NT, Hong Kong, PR China

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ABSTRACT

Background: Heart failure is an increasing public health problem globally. Interventions are imperative in managing the disease.

Objective: To examine the effectiveness of a health education booklet and telephone follow-ups on patients' medication adherence, health-related quality of life, and psychological status.

Methods: One hundred and sixty heart failure patients were assigned to either the experimental group (health education booklet and telephone follow-ups) or the control group (usual care). An independent *t*-test and the generalized estimating equation (GEE) model were used to compare the differences in the study outcomes. The statistical tests were two-sided and a *p* value below 0.05 was considered statistically significant.

Results: The patients in the experimental group showed greater improvement throughout the study period compared with those in the control group regarding all the study outcomes.

Conclusions: The study provided clues for healthcare professionals to develop interventions while undertaking clinical work with limited resources in China.

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Introduction

Heart failure (HF) is a major public health problem and a leading cause of mortality and morbidity worldwide, including China.^{1,2} According to a large-scale epidemiological investigation in 2003, there were approximately 4,000,000 HF patients aged 35–74 in China.³ The number of patients will rise significantly in light of the global trend of an increasing incidence of hypertension and coronary heart disease together with an aging population.

HF can influence patients' lives in all aspects. Not only do the symptoms of HF bring myriad suffering to patients,⁴ but other consequences, such as a decreased health-related quality of life (HRQoL),⁵ an adverse psychological status,⁶ and an increased financial burden, put patients in an even worse situation when they live with such a disease.^{7,8} Interventions to manage the disease are therefore imperative to effectively control the condition and alleviate patients' burdens.

There are actually quite a number of heart failure disease management programmes which have been designed and developed for this specific population. Many components, such as education, different kinds of follow-up, psychological support, and physical exercise, have been gradually implemented into the programmes to gain better effects of disease control and more benefits. However, as more than one component is involved in these programmes, it is difficult to identify which component actually works.⁹ As suggested, it is the component that is common to all formats of the programmes, rather than the format itself, that plays a key role in different programmes.¹⁰ Among the various programmes, health education and follow-ups are the key elements because of their frequent presence and strong similarity in these programmes. Moreover, education and follow-up are also suggested as the essential and effective components in managing the disease.^{11–15}

According to various studies, the contents of HF education cover quite a few topics. Among these topics, self-management strategies such as a low-sodium diet, weight and symptoms monitoring, adherence to a treatment regimen, and appropriate physical exercise are particularly emphasized. It is believed that

* Corresponding author. Tel.: +86 10 88771120; fax: +86 10 88771020.
E-mail address: yumm0216@163.com (M. Yu).

the self-management strategy might be as important as ensuring that patients are prescribed appropriate pharmacological therapy.¹⁶ Follow-ups are another component that is included in a majority of the programmes to reinforce the key points of HF education, provide continuous psychological support, supervise patients' compliance with the treatment regimen, and detect early exacerbation of HF during each follow-up.^{13–15}

The effectiveness of HF education and telephone follow-ups has been investigated in previous studies.^{17–21} The materials that were used for health education have included an educational booklet,^{17,18} a written education package which was developed based on the findings of a previous focus group,¹⁹ and written materials and treatment guidelines.^{20,21} The telephone follow-ups mainly aimed to reinforce the education already given or provide additional education, emphasize adherence, assess potential problems, monitor any deterioration of symptoms, and coordinate communication between patients and physicians. No medication adjustment was provided during the telephone follow-ups.^{17–21} The outcomes that the researcher aimed to examine varied among these studies. Some studies have reported that HF education and telephone follow-ups significantly decreased clinical events such as readmission, length of stay in hospital, and death.^{17–20} Some studies have shown that such interventions improved patients' self-care behavior or self-efficacy.^{18,20} Other studies have documented that interventions significantly increased patients' knowledge¹⁸ and decreased the cost of care.^{17,19,20} However, the interventions effectiveness on medication adherence, HRQoL, and psychological status throughout these studies was limited. Accordingly, the present study aims to examine the effectiveness of a combination of two components on patients' outcomes in medication adherence, HRQoL, and psychological status.

Theoretical framework underpinning the interventions

Patient education is defined as “the process of influencing patient behavior and producing the changes in knowledge, attitudes, and skills necessary to maintain or improve health.”²² For the current study, the simple knowledge-attitude-practice (KAP) model, which is a frequently adopted cognitive model developed by learning theorists,^{23,24} was used to underpin the interventions.

The KAP model postulates that individuals first acquire knowledge related to a practice, and with this knowledge they develop a positive attitude towards the practice, which in turn induces behavior changes.^{23,24} Many studies have proved that the relationships between knowledge, attitude, and practice are positive.^{23,25} Thus, the first step to changing individuals' behavior is to equip them with adequate and appropriate knowledge according to this model.

Based on the KAP model and related theories, the health education booklet in the current study aimed to influence patients' behaviors by increasing their knowledge, awareness of the disease, and self-management strategies. Behavior changes were also expected to occur given the situation that most of the HF patients lacked essential knowledge of the disease and self-management strategies according to our findings from a previous qualitative study. In addition, the telephone follow-ups aimed to help patients consolidate what they had learned to maintain the lifestyle they had adopted. Based on possible behavior changes which may be influenced by knowledge acquisition, the outcomes that were expected in the current study, including improved medication compliance and HRQoL, and decreased depression and anxiety, might in theory be achieved.

Methods

Study setting and participants

The study was conducted at a university-affiliated hospital in Xi'an, China. The cardiovascular department of this hospital was comprised of four sub-units, 1 through 4, and one cardiac care unit with approximately 220 beds. The four sub-units had a similar staff mix, treatment protocols, facilities, and resources.

All of the patients who were admitted to the cardiovascular department of the hospital were invited to participate in the study. The inclusion criteria included patients who were (1) diagnosed with HF; (2) 18 years or older; (3) able to read and speak Mandarin; and (4) able to be contacted by telephone for follow-ups. The exclusion criteria included those patients who had (1) unstable angina, resting tachycardia (>120 beats/min), or severe arterial hypertension; (2) an impaired mental state; (3) a terminal illness other than HF; or (4) impaired bilateral hearing or vision. The inclusion and exclusion criteria were judged based on the patients' medical records and consultation with their physicians.

In the current study, a medium effect size of 0.5 was the aim for detecting all of the outcome variables, based on previous studies.^{17,19} According to Cohen,²⁶ a sample size of 64 subjects in each group would provide the study with 80% power to detect a medium effect size of 0.5 in the outcome variables at a 5% level of significance. With an anticipated attrition rate of 20%, a total of 160 patients were required for the study, with 80 in each group.

Group assignment

The current study used a prospective controlled trial for investigation, meaning the sub-units of the cardiovascular department were randomized. Eligible patients who were admitted to an even-numbered unit (2 or 4) of the cardiovascular department were assigned to the experimental group, while those who were in an odd-numbered unit (1 or 3) were in the control group. The unit allocation was decided by tossing a coin.

Interventions

In the present study, all of the interventions were implemented by one researcher to maintain the consistency of the interventions. The participants in both groups received usual care provided by the hospital, which involved (1) brief introductions of the disease and the hospital environment when the participants were admitted to hospital; (2) brief hospital discharge education; (3) provision of a medication sheet; and (4) an appointment for outpatient follow-up. In addition, the participants in the experimental group received a health education booklet and telephone follow-ups.

Regarding the booklet, its format and layout were mainly based on the information needs of patients identified through a previous questionnaire survey²⁷ and qualitative interviews. Several measures, according to the rules suggested by Hackos and Stevens, were taken to improve the readability of the booklet, such as avoiding medical terminology and using short and simple words.²⁸ An expert panel that was made up of four cardiologists and three senior cardiac nurses, together with two patients, were invited to evaluate the content validity and readability of the booklet. Necessary revisions were made according to the comments of the expert panel and the patients.

Health education was carried out in two sessions. The first session was initiated on the fourth day after admission and the second session was conducted the day before discharge. In addition to an individual face-to-face education session, the participants in the experimental group were also asked to read the health

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