



Effectiveness of an educational intervention (the Encourage Autonomous Self-Enrichment Program) in patients with chronic kidney disease: A randomized controlled trial



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ABSTRACT

Background: Self-management is an important step toward preventing and impeding the progression of chronic kidney disease. However, patients with chronic kidney disease may have few or no subjective symptoms and therefore might consider self-management to be unnecessary. Effective support and encouragement of self-management in patients with chronic kidney disease is therefore required.

Objectives: This study tested the effectiveness of the Encourage Autonomous Self-Enrichment patient education program, which supports patient autonomy and intrinsic motivations with the aim of improving self-efficacy and sustaining self-management, on perceived self-efficacy, self-management behaviors, and physiological endpoints (blood pressure and renal function parameters) in patients with chronic kidney disease.

Design: This was a randomized, controlled, single-blind trial with one-to-one allocation into two groups. **Settings:** The study was conducted at 13 Japanese clinics or general hospitals that specialize in internal medicine and urology.

Participants: Participants included patients who were diagnosed with chronic kidney disease and were not receiving dialysis. Patients were recruited from among those attending follow-up visits at participating institutions.

Methods: A total of 65 participants were randomly allocated into the intervention (n = 33) and control (n = 32) groups. The intervention group followed the Encourage Autonomous Self-Enrichment program action plan for 12 weeks. The control group received standard education provided by nurses who distributed leaflets in accordance with physicians' instructions, provided auxiliary medical services, and answered patients' questions.

Results: Except for 1 participant who died after 4 weeks, all 33 members of the intervention group continued the Encourage Autonomous Self-Enrichment program for 12 weeks. This program intervention yielded significant improvements in perceived self-efficacy (U = 318.5, p = 0.035, effect size r = 0.27) and self-management behaviors (U = 310.0, p = 0.026, effect size r = 0.29). There were no differences in blood pressure or renal function between the groups; however, serum potassium levels decreased in the intervention group and increased in the control group (t (58) = 1.047, p = 0.299, effect size d = 1.49). No intervention-related adverse events, such as worsening of patients' test results, were observed.

Conclusions: These findings indicate that the Encourage Autonomous Self-Enrichment program yielded improvements in perceived self-efficacy and self-management behaviors in patients with chronic kidney disease not treated with dialysis.

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What is already known about the topic?

- Chronic kidney disease patients are likely to consider self-management unnecessary because they have few or no subjective symptoms; therefore, they cannot readily be convinced to make lifestyle changes.
- Conventional patient education has provided the knowledge and skills needed to comply with the required self-management, but

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does not effectively encourage the patient to take action towards solving the problem.

- The EASE program has been proposed as an assistive method to maintain self-management in dialysis patients, and its effectiveness has been demonstrated.

What this paper adds

- The EASE program enables nurses to support patient autonomy, and leads to the continuation of self-management behaviors. This program is worth considering for patients with chronic kidney disease.
- In this study, patients who participated in the EASE program experienced improvements in perceived self-efficacy and self-management behaviors.
- The EASE program has been proposed as an assistive method to maintain self-management in patients with chronic kidney disease, and its effectiveness has been demonstrated.

1. Introduction

The prevalence of chronic kidney disease is increasing worldwide. Recent data revealed that 2.38 million individuals in the United States lived with chronic kidney disease in 2013 (United States Renal Data System, 2013). A similar trend was also observed in Japan. In particular, more than 31 million Japanese patients with end-stage renal disease were receiving dialysis treatment in 2012 (Japanese Kidney Disease Society, 2013). The medical expenses associated with dialysis treatment total approximately 1.6 trillion yen per year, accounting for approximately 4.1% of the national health expenditure; accordingly, this has become a major problem from the viewpoint of medical economics (Ministry of Health, Labour and Welfare, 2013). To solve this problem, it is important not only to reduce the medical costs of dialysis, but also to impede the progression of chronic kidney disease and delay the introduction of dialysis.

However, patients with chronic kidney disease are not likely to consider self-management necessary because they have few or no subjective symptoms; therefore, they cannot readily be convinced to make lifestyle changes. Renal function cannot be recovered once it has declined, and patients are forced to live with a lifetime disease; however, patients often drop out of treatment programs because of stress and decreased perceived self-efficacy. Often, renal function losses can be delayed by using preventative measures at earlier stages of disease. Thus, effective support is required to encourage self-management in non-dialysis patients with chronic kidney disease.

Although conventional patient education focuses on providing the knowledge and skills necessary for self-management and encouraging patients to act accordingly, one-directional knowledge provision does not result in behavioral changes, as patients do not perceive the necessity of self-management because of the lack of subjective symptoms in early-stage chronic kidney disease. The finding that autonomous decision making and self-efficacy influence self-management behavior modification (Deci and Ryan, 2002; Moriyama et al., 2009) indicates that patients require support to make optimal decisions and maintain self-efficacy.

The Encourage Autonomous Self-Enrichment (EASE) program was developed with the aims of increasing patient autonomy and encouraging behavioral changes and self-management (Oka, 1997a, 1997b, 2001). The core concepts of intervention models used in the EASE program were based on three models that identified factors with effects on health behaviors: self-efficacy (Bandura, 1997), an interaction model of client health behavior (Cox, 1982), and health promotion model (Pender, 1996). This

program aims to support patient autonomy, to increase knowledge and self-efficacy in order to improve the performance of self-management behaviors, and to sustain self-management.

Previous studies have found that the EASE program is effective in increasing self-efficacy and improving self-management, primarily in the context of dieting and weight management for dialysis patients (Nozaki et al., 2005; Onbe et al., 2008; Sagawa et al., 2001, 2003); however, its utility in non-dialysis chronic kidney disease patients remains unclear.

Improvements in daily lifestyle practices, including diet and blood pressure management, are important steps in preventing or impeding the progression of chronic kidney disease. Under the guidance of the EASE program, patients with chronic kidney disease are motivated to improve their lifestyle practices, which leads to continuous self-efficacy and self-management. Furthermore, such behavioral changes can lead to the prevention of cardiovascular disease and may delay the onset of end-stage renal disease, as behavioral changes in early chronic kidney disease can be reflected in physiological data. Therefore, we believe that the EASE program is applicable to patients with chronic kidney disease who are not undergoing dialysis.

The aim of this study was to verify the efficacy of the EASE program in non-dialysis patients with chronic kidney disease (stages 1–5) through a randomized controlled trial. We compared an intervention group that participated in the EASE program to a control group that received conventional patient education. We investigated the effects of the EASE program on perceived self-efficacy, self-management behaviors, and physiological endpoints such as systolic and diastolic blood pressure and renal function parameters. The following study hypotheses were investigated: [1] patients in the intervention group who participated in the EASE program will report better scores for perceived self-efficacy and self-management behavior than those in the control group; and [2] patients in the intervention group, who utilized the EASE program, will experience a more gradual decline in systolic and diastolic blood pressure control and renal function parameters, compared to those in the control group.

2. Methods

2.1. Trial design

This study was designed as a single-blind randomized controlled trial with one-to-one allocation into two groups. The intervention group participated in the EASE program, and the control group received standard patient education. The primary outcomes were perceived self-efficacy and self-management behaviors. Secondary outcome measures, including blood pressure and renal function data (creatinine, estimated glomerular filtration rate, serum potassium level, and hemoglobin level), were collected before starting and upon completion of the 12-week intervention (Fig. 1).

2.2. Participants

Patients were required to satisfy the following inclusion criteria: [1] age of ≥ 20 years, overt proteinuria, and clinically diagnosed chronic kidney disease; [2] at least 6 months of treatment and outpatient visitation; and [3] literacy and an ability to understand the objectives of the study. The following exclusion conditions were applied: [1] diagnosis with any fatal disease (e.g., cancer) that would affect prognosis; [2] potential for the introduction of dialysis within 6 months (glomerular filtration rate ≤ 15 mL/min/1.73); and [3] requirement of assistance from others because of cognitive impairment or a bedridden status.

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