



Effect of goal attainment theory based education program on cardiovascular risks, behavioral modification, and quality of life among patients with first episode of acute myocardial infarction: Randomized study



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ABSTRACT

Effect of goal-attainment-theory-based education program on cardiovascular risks, behavioral modification, and quality of life among patients with first episode of acute myocardial infarction: randomized study

Background: The behavioral modification strategies should be explored at the time of admission to lead the maximum effect of cardiovascular risk management.

Aims: This randomized study aimed to elucidate the effects of a nurse-led theory-based education program in individuals with a first episode of acute myocardial infarction on cardiovascular risks, health behaviors, and quality of life over 6 months.

Methods: The study involved a convenience sample of 64 patients with acute myocardial infarction who were randomly assigned to either the education group or the control group. The goal-attainment-based education program was designed to set the mutually agreed goals of risk management and the behavioral modification strategies for achieving those goals. Those in the control group received routine management only. The participants in both groups were contacted at 6–8 weeks and at 6 months after discharge to measure outcome variables. Repeated measure ANOVA was conducted using SPSSWIN (version 20.0) to determine the significance of differences in outcome variables over 6 months between the groups.

Results: Both groups showed significant positive changes in cardiovascular risks, health behaviors, and quality of life over 6 months. The 2-year risk of cardiovascular disease was significantly reduced in both study groups, but with no significant interaction effect ($F=2.01$, $p=0.142$). The performance and maintenance of health behaviors ($F=3.75$, $p=0.029$) and the mental component of quality of life ($F=4.03$, $p=0.020$) were significantly better in the education group than the control group.

Conclusion: Applying a goal-oriented education program at an early stage of hospital management improved and maintained blood glucose, health behaviors, and mental component of the quality of life up to six months in individuals with a first episode of myocardial infarction. Further studies are warranted to explore the role of behavioral modification mediating between cardiovascular risk management and quality of life in this population.

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What is already known about the topic?

- The morbidity and mortality of cardiovascular disease are strongly affected by modifiable behavioral risk factors through the performance of health behaviors.

- Behavioral strategies targeted at the individual and which can be implemented by health professionals at the point of admission should be explored in order to maximize the effects of risk management.

What this paper adds

- A goal-attainment-theory-based education program was applied to individuals with a first episode of acute myocardial infarction with high adherence to the program over 6 months.

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- The participants who received the goal-oriented education showed significantly better blood glucose control, overall health behaviors, and the mental component of quality of life over 6 months compared to those who received usual care only.
- The nurse-led education program with individualized goal-oriented approach can easily be integrated to the current medical treatment system to lead more effective lifestyle modification.

1. Introduction

The cardiovascular and cerebrovascular diseases are still major causes of premature death, accounting for 22.0% of all deaths in Korea in 2010 (KOSIS, 2014). The age-standardized incidence of hospitalized acute myocardial infarction and stroke has decreased continuously over the past decade due to aggressive medical management (Kim et al., 2013), but the disease burden remains high (Lloyd-Jones et al., 2010). Cardiovascular disease management strategies have focused on risk assessments, which contributes to the prevalence of chronic diseases including hypertension, diabetes, and other forms of atherosclerotic disease (Jacobs et al., 2014). The morbidity and mortality of cardiovascular disease are strongly affected by modifiable behavioral risk factors. The quantitative relationship between these risk factors and the incidence of coronary artery disease has been elucidated by the Framingham Heart Study (D'Agostino et al., 2008), which revealed that the main risk factors are additive in predictive power.

The potential for improving clinical outcomes on risk reduction by implementing behavioral modification is well recognized (Maruthur et al., 2009), yet the strategies applied to motivate individuals to perform and maintain health behaviors are far from optimal. Previous randomized trials on lifestyle modification to cardiovascular risk management reported promising but mixed findings. A multicenter randomized trial on 792 patients with coronary artery disease provided a coaching intervention, and the participants who were coached showed a significantly greater reduction in some of cardiovascular risks and performed better health behavior than those who received usual care only (Vale et al., 2003). A telephonic coaching was also used in five Dutch hospitals to patients with recent coronary events, and found that the coaching intervention has significant favorable effects on BMI, physical activity, daily intake of vegetables, and self-management. No significant changes were found in other cardiovascular risks and quality of life (Leemrijse et al., 2016). Common motivation strategies applied on coaching or structured education program for lifestyle modification include individually tailored risk factor assessment (Lear et al., 2003), counseling and monitoring lifestyle goals (Saffi et al., 2014), negotiating a plan of action to achieve the individual goals and providing feedback (Vale et al., 2003), and emotional support and coping guide for lifestyle changes (Hanssen et al., 2007).

The behavioral strategies for cardiovascular risk reduction should start right after the admission to implement (1) fast assessment of individual risk factors, (2) setting the reasonable goals for personal attainment, (3) motivating the individual to adopt behavioral modification prescription, and (4) follow up to ensure that a healthy lifestyle is maintained over the long term (Stuart-Shor et al., 2012). The objective of early cardiac rehabilitation should be to assist patients to regain autonomy and reinstate their optimal physical, mental, and social conditions via their own efforts (Mampuya, 2012). Behavioral strategies targeted at the individual and which can be implemented by health professionals at the point of admission should be explored in order to maximize the effects of risk management (Stuart-Shor et al., 2012).

In addition, active patient involvement in treatment discussions and care processes during hospitalization is a key strategy to

optimizing treatment outcomes (Arnetz et al., 2008). While acute myocardial infarction is a potentially life-threatening experience for patients, especially those who experience this for the first time, their initial perceptions and self-control over the disease process may be important determinants of their recovery and motivation for the subsequent adoption of a healthy lifestyle to prevent further disease. Programs simply based on managing symptoms and modifying health habits have little chance of success if the participants are not ready to adopt new behaviors and if their perceived needs are not prioritized in the management plan (Paquet et al., 2005).

According to King's theory of goal attainment (Fawcett, 2000), the patient and nurse need to work together when setting goals and working toward achieving these goals. Based on King's framework, goal-oriented strategies can be applied to those with a first episode of AMI to ensure effective behavioral modification through the process of interaction, where the patient and the health professional mutually identify the specific cardiovascular risks that the individual has, and agree to pursue the goal of risk management together.

Based on the theory of goal attainment, the present study applied a goal-oriented education program to individuals with a first episode of myocardial infarction to evaluate the program effects on cardiovascular risks, health behaviors, and quality of life over 6 months. The specific purposes were as follows:

- To compare the cardiovascular risk factors based on the Framingham risk score over 6 months between two study groups.
- To compare the performance of health behaviors over 6 months between two study groups.
- To compare the health-related quality of life over 6 months between two study groups.

2. Methods

2.1. Study design and participants

A randomized experimental study with three measurement time points was conducted. Patients who had their first episode of acute myocardial infarction (AMI) at the cardiovascular center of a university hospital were invited to participate in this study. The inclusion criteria for the study participants were (1) diagnosed with a first episode of AMI (ST-elevation MI, non-ST-elevation MI), (2) admitted to the cardiac units for 3 days or longer for percutaneous coronary intervention, (3) eligible for an inpatient cardiac rehabilitation program referred by their primary physician, and (4) agreed to participate in the study up to 6 months of follow-up. Those in the education group received the goal-attainment-theory-based education program according to their tailored cardiovascular risk management plan, while those in the control group received a routine inpatient cardiac rehabilitation program provided by a nurse educator.

The required sample size was estimated using the GPower 3.1 program (Erdfelder et al., 1996) for independent groups, with an alpha of 0.05 and an effect size of $d=0.73$, as computed in a previous randomized study of nurse led clinics on cardiovascular risk scores (Campbell et al., 1998). A power value of 0.8 was predicted for a study involving 62 participants in 2 groups. After screening 120 potential participants, a convenience sample of 64 patients with a first episode of AMI was enrolled in the study and randomly assigned to either the education group or the control group prospectively. Intention-to-treat principle was applied to keep the participants in each group to which they were

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