



## Health-related Quality of Life in Symptomatic Postmyocardial Infarction Patients with Left Ventricular Dysfunction



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### ARTICLE INFO

#### Article history:

Received 14 April 2014

Received in revised form

22 October 2014

Accepted 4 November 2014

#### Keywords:

heart failure  
myocardial infarction  
quality of life  
self-care  
signs and symptoms

### SUMMARY

**Purpose:** Symptoms of postmyocardial infarction (post-MI) patients at risk for progression to heart failure are often ignored, and lack of symptom recognition or misinterpretation may diminish health-related quality of life (HRQoL). This study was conducted to evaluate the differences in HRQoL by symptom experience and determine factors that predict diminished HRQoL in post-MI patients.

**Methods:** Using a descriptive correlational study design, post-MI patients with left ventricular dysfunction (ejection fraction < 50%) completed face-to-face interviews for symptoms, HRQoL, covariates including self-care compliance, New York Heart Association class, and demographic and clinical questionnaires.

**Results:** A total of 105 post-MI patients participated (mean age 65 years, 79.0% male, mean ejection fraction 43.6%, New York Heart Association class III/IV 33.3%). Mean length of time after the cardiac event was 48 months. Patients reported four or more symptoms, with fatigue being the most common symptom (63.8%), followed by shortness of breath (56.2%), weakness (54.3%), and dizziness (51.4%). HRQoL was moderately poor, with a mean score of  $44.38 \pm 27.66$ . There was no significant relationship between self-care compliance and HRQoL. Patients who were female, with low monthly income, and had lower functional capacity and more symptoms had worse HRQoL, after controlling for age and length of time after the event (adjusted  $R^2 = 0.53$ ,  $p < .001$ ).

**Conclusions:** A need for transitional care that assists post-MI patients take an active involvement in symptom monitoring arises so that they can get into the system earlier and benefit from treatment, and eventually achieve desirable HRQoL.

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### Introduction

Prolonged exposure to the myocardial infarction (MI), in turn increases the risks for the development of a complex syndrome of heart failure (HF) [1]. In Korea, MI has increased by 55% in prevalence over the last 5 years, and survival after MI has increased with advances in the treatment over the past decade [2–3]. It is estimated one million Koreans having HF, of which MI is an etiology in 32% of HF patients [4]. Progression to HF after MI involves the extent of myocardial damage at the time of cardiac event, recurrent ischemia and the development of myocardial stunning and hibernation,

remodeling and chronic neuroendocrine stimulation [1,5]. Particularly, patients with significant left ventricular dysfunction after MI are at high risk for progression to a chronic complication of HF, requiring careful evaluation for HF development [1].

The prompt post-MI treatment and strategic plans for following self-care, such as symptom monitoring may prevent structural remodeling of the heart and progression to HF [1]. Symptom experience is a critical component when determining a diagnosis of HF but often ignored due to patients' inability to symptom recognition and misinterpretation of symptoms as atypical and not heart specific [6]. Particularly, post-MI management has focused on prevention of a second episode of cardiac event through stress management, risk factor control, symptom management and recovery from cardiac surgery [7], while as patients live with the disease, challenge may occur in understanding the association between symptom exacerbation and worsening disease. Thus, MI

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patients are unlikely to report symptoms promptly to the health care providers due to lack of symptom awareness, leading to delay in seeking medical help for worsening disease [7–8]. In HF, symptom influences have been well-documented in the associations with functional decline [9–10] and diminished health-related quality of life (HRQoL) [9,11–12]. However, evidence of post-MI symptom monitoring that may be an important self-care strategy for early diagnosis and management of HF was seldom reported. Postoperative symptom recovery has been studied among patients who underwent coronary angioplasty [13] or coronary artery bypass graft [7]. The studies found that self-management intervention significantly improved outcomes including cardiac events and quality of life outcomes through enhancing postoperative symptom recovery. Compared to those with the usual care, patients in the intervention group reported significantly fewer symptom experience [7,13], significantly better HRQoL but no difference in cardiac recurrence observed at 6 months after surgery [13]. They also showed significantly greater physical functioning and physical activity at 6 weeks and 3 months after surgery, with significant correlations between recovery symptoms of shortness of breath, fatigue, depression, incision pain, and sleep problems and physical functioning [7]. In addition to the symptom experience, compliance with self-care, including medication, diet, exercise, smoking, and emotional distress control, has been proven to prevent a second cardiac event in post-MI patients [14]. Compliance with self-care and lifestyle modification is needed to experience less symptoms during daily living and ensure effective medical treatment for post-MI patients and to improve HRQoL [13,15]. Accordingly, it is important to assess the level of compliance behavior of self-care in post-MI patients, whether self-care compliance has an impact on HRQoL, and whether the positive effect of self-care compliance attenuates frequent symptom experience, particularly in those with left ventricular dysfunction. Periodic symptom evaluation may spur post-MI patients with left ventricular dysfunction to seek treatment earlier and follow self-care recommendations.

Despite the importance of extended postoperative symptom recovery to symptom management for prevention of complications including HF after MI, longer-term symptom evaluation of post-MI patients has been underestimated in research and clinical practice. Given a presence of self-care compliance, little attention has been paid to the impact of symptom experience on HRQoL among post-MI patients who may experience HF symptoms but where HF has not been diagnosed.

To address this problem, the first aim of this study was to evaluate the differences in HRQoL by symptom experience among post-MI patients with left ventricular dysfunction. The second aim was to determine whether the symptoms predict HRQoL in post-MI patients, after controlling for age, gender, monthly income, functional status, and self-care compliance.

## Methods

### Study design

This study adopted a descriptive correlational design to identify the differences in HRQoL by symptom experience and determine the factors that predict diminished HRQoL in post-MI patients.

### Setting and sample

Post-MI patients with left ventricular dysfunction were recruited from a university affiliated outpatient clinic in South Korea. Eligibility criteria included (a) a diagnosis of MI with greater than 12-month lapse prior to enrollment and (b) left ventricular ejection fraction (LVEF) at less than 50%, documented by echocardiography

within the past year. Patients were excluded if they (a) have documented cardiac events ( $\leq 90$  days after hospitalization or emergency visits for another episode of heart attack or acute HF), (b) have a diagnosis that precludes giving informed consent and agreement to participate in the research, or (c) were unable to communicate verbally. Left ventricular dysfunction was determined by the European Society of Cardiology Guideline, which stated LVEF at less than 50% as abnormal left ventricular function [16]. The sample size calculation was based on regression analysis with 6 predictor variables, using G\*power computer program. The sample size was 98 to detect a medium effect size, with power of .80 and an alpha level of 5% for two-tailed tests. We enrolled 105 patients to account for a 7% withdrawal rate and ensure sufficient statistical power.

### Ethical consideration

The study was approved by the Institutional Review Board of the studied hospital for all recruitment and research methods (no. CNUH 2011-094) and the study was performed in accordance with the Declaration of Helsinki. Written informed consent was obtained from each participant. A research nurse conducted face-to-face interviews at the sites designated for the interviews of the study.

### Measurements

#### Symptoms

The Friedman-Heart Failure Symptom Checklist [17] was used to evaluate symptoms among post-MI patients. This checklist consists of 13 symptoms that HF patients often experience [17], including shortness of breath with exertion, difficulty breathing when lying flat in bed, waking up breathless at night, feet or ankles swelling, weight gain, fatigue, weakness, dry hacking cough, poor appetite, nausea, dizziness, palpitations, and chest pain. Patients were asked to answer “yes” (score 1) or “no” (score 0) for each of the 13 symptoms during the previous 2 weeks. Validity and reliability have been documented. Reliability estimates of the Friedman’s checklist were .83 among 103 HF patients [17] and the Kuder-Richardson’s reliability estimate in the current sample was .80.

#### Compliance with self-care

The self-care compliance for patients with MI was used to evaluate compliance with self-care [13]. The scale consists of 23 items that address follow-up clinic visit and medication (5 items), diet and weight management (8 items), drinking and smoking (2 items), exercise and rest (4 items), sexual behavior (1 item), stress management (1 item), and blood pressure and pulse monitoring (2 items). All items were scored on 5-point response scales (from 1 “strongly disagree” to 5 “strongly agree”) with a possible score ranging from 23 (worst self-care compliance) to 115 (best self-care compliance). The reliability of the instrument has been established with a Cronbach’s alpha coefficient of .80 among 58 MI patients [13]. The Cronbach’s alpha in the current sample was .73.

#### HRQoL

The Minnesota Living with Heart Failure Questionnaire (MLHFQ) was used to evaluate HRQoL [18]. It is one of the most widely used HF-specific HRQoL measure. It was chosen for post-MI patients because many of them had been experiencing HF symptoms since the initial episode of cardiac event, but they had yet to be diagnosed with HF. In past studies, the MLHFQ was feasible for evaluating HRQoL in patients with valvular heart diseases, alcoholic cardiomyopathy, and ischemic heart disease at an HF clinic in Spain [19]. It has also been used in mixed populations of patients with heart diseases including HF, angina, and MI [20]. The MLHFQ consists of 21 items with each item evaluating the degree of functional limitations

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