



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



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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 ± 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 (≤ 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

and deterioration in quality of life produced by HF symptoms in the past month using a 6-point response scale (from 0 “not at all” to 5 “very much”). Possible scores range from 0 to 105, with higher scores indicating worse HRQoL. Among the 21 items, the MLHFQ also consists of physical (8 items), emotional (5 items), and socio-economic (8 items) subscales, with scores ranging from 0 to 40, 0 to 25, and 0 to 40 respectively. For our study, a total score was used as an outcome measure. Validity and reliability of the Korean version of the MLHFQ have been verified in 154 patients with HF [21], with both total and subtotal scales having Cronbach's alphas greater than .80. In the current study, the Cronbach's alpha was .92.

Demographic and clinical characteristics

Demographic characteristics including age, gender, educational level, living arrangement, and monthly income were collected. Clinical variables were obtained from the medical record review, including a diagnosis of the following conditions: with or without ST segment elevation, New York Heart Association (NYHA) class, LVEF, comorbid medical conditions, number of hospital admissions, and follow-up time after first cardiac event in months.

Data collection

Data were collected from July to November 2011. The trained research assistant who was an experienced research nurse belonging to the cardiology department of the hospital conducted face-to-face interviews at the sites designated for research interviews in the University Hospital. The length of time to complete a face-face interview was 30 minutes.

Data analysis

Descriptive statistics were conducted for demographic and clinical characteristics in order to fully describe the sample. To achieve the first aim of the study and evaluate the differences in HRQoL by symptoms, student *t* tests, one way analysis of variance were computed. A multiple linear regression analysis with stepwise approach was computed to address the second aim of the study, with an HRQoL score entered as a dependent variable and age, gender, length of time after the initial cardiac event, NYHA class, LVEF and symptom frequency entered as independent variables in a regression equation. The statistical analyses were performed using SPSS version 21.0 (IBM SPSS Statistics, Chicago, IL, USA) for Windows with the significance level set at alpha equals .05.

Results

A total of 105 patients completed the interviews with no withdrawal. Sample characteristics are presented in Table 1. The mean age of patients was 65 years ($M \pm SD$, 64.95 ± 10.91 years, range of 36–91 years) and 79.0% ($n = 83$) were male. Approximately 38.1% of patients had a high school education or higher. The mean LVEF at the first cardiac event was 43.6% ($\pm 10.1\%$, range of 26.1–73.4%) and follow-up LVEF (measured at an average of 48 months apart from the initial event) was 40.8 ($\pm 8.3\%$, range of 20.3–50.2%). In the sample, 31.4% of the patients reported no functional limitation imposed by symptoms of HF (NYHA class I), 35.2% were mildly symptomatic (II), and 33.3% had marked limitations (III/IV) of or were unable to engage in physical activity without symptoms. Length of time after the initial cardiac event was 52.19 months (± 28.08 months) (Table 2).

A mean number of cardiac symptoms that patients reported were 4.71 (± 0.92 , range of 0–12). Fatigue was the most common symptom in post-MI patients (63.8), followed by shortness of breath at exertion (56.2%), weakness (54.3%), dizziness (51.4%), and

Table 1 Demographic Characteristics of Participants ($N = 105$).

Variables	Categories	$M \pm SD$	n (%)
Age (yr)	36–65	64.95 ± 10.91	53 (50.5)
	66–91		52 (49.5)
Gender	Male		83 (79.0)
	Female		22 (21.0)
Education	None		18 (17.1)
	Elementary school (≤ 6)		25 (23.8)
	Middle school (7–9)		22 (21.0)
	High school (10–12)		24 (22.9)
	University (13–16)		12 (11.4)
	\geq Graduate school (≥ 17)		4 (3.8)
Living area	Urban		70 (66.7)
	Rural		35 (33.3)
Living alone	Yes		20 (19.0)
	No		85 (81.0)
Occupation	No		68 (64.8)
	Yes		37 (35.2)
Monthly income (USD)	< 1,000		61 (58.1)
	1001–2000		14 (13.3)
	2001–3000		13 (12.4)
	3001–4000		11 (10.5)
	> 4000		6 (5.7)
Exercise	Not at all		28 (26.7)
	< 1 per week		11 (10.5)
	2–3 per week		11 (10.5)
	≥ 4 per week		55 (52.4)
Smoking	None		27 (25.7)
	Ex-smoker		59 (56.2)
	Current smoker		19 (18.1)
Alcohol drinking	No		81 (77.1)
	Yes		24 (22.9)

Table 2 Clinical Characteristics of Participants ($N = 105$).

Variables	Categories (Range)	n (%)	$M \pm SD$
NYHA class	I	33 (31.4)	43.6 ± 10.1
	II	37 (35.2)	
	III	31 (29.5)	
	IV	4 (3.8)	
LVEF at the first event (%)	(26.1–73.4)		43.6 ± 10.1
Follow-up LVEF (%)	(20.3–50.2)		40.8 ± 8.3
Diagnosis at the first event	STEMI	73 (69.5)	
	NSTEMI	32 (30.5)	
Family history of CVD	Yes	45 (42.9)	
	No	60 (57.1)	
Comorbidity	Diabetes	42 (40.0)	
	Hypertension	40 (38.1)	
	Stroke	10 (9.5)	
No. of hospital admission	(1–10)		2.39 ± 1.77
Length of first hospitalization (days)	(2–72)		10.26 ± 8.65
Follow-up period after first event (month)	(12–173)		52.19 ± 28.08
Length of follow-up LVEF period after first event (month)	(0–153)		27.95 ± 30.94

Notes. NYHA = New York Heart Association; HRQoL = health related quality of life; LVEF = left ventricular ejection fraction; STEMI = ST-elevated myocardial infarction; NSTEMI = non-ST-elevated myocardial infarction; CVD = cardiovascular disease; AMI = acute myocardial infarction.

dry and hacking cough (41.9%) (Table 3). A mean score of self-care compliance was fair with a mean score of 95.83 ± 10.61 (range of 69–114). Perceptions of overall HRQoL as measured by MLHFQ were moderately low, with a mean score of 44.38 ± 27.66 (range of 0–103). To address the first aim of the study, patients were divided

Table 3 Experienced Symptoms among Study Participants (*N* = 105).

Symptoms	<i>n</i> (%)
Fatigue	67 (63.8)
Shortness of breath with exertion	59 (56.2)
Weakness	57 (54.3)
Dizziness	54 (51.4)
Dry and hacking cough	44 (41.9)
Palpitations	36 (34.3)
Swelling in the feet or ankles weight gain	35 (33.3)
Chest pain	34 (32.4)
Poor appetite	27 (25.7)
Difficulty breathing when lying flat in bed	26 (24.8)
Weight gain	24 (22.9)
Waking up breathless at night	19 (18.1)
Nausea	15 (14.3)
No. of symptoms <i>M</i> ± <i>SD</i>	4.71 ± 0.92

Multiple responses were allowed.

into high and low symptom groups, using a median score of symptoms (median at 5). More symptomatic post-MI patients had worse HRQoL, compared to those with fewer symptoms ($t = 4.52$, $p = .014$). In particular, those with fatigue had significantly poorer HRQoL than those without fatigue ($t = 3.09$, $p = .032$).

To address the second aim, bivariate analyses and stepwise multiple linear regression analysis were conducted (Tables 4 & 5). Prior to stepwise multiple linear regression analysis, normality of study variables and multicollinearity using tolerance of a variable and the variance inflation factor were checked. A score of HRQoL was entered as a dependent variable and age, gender, monthly income, NYHA class (3 dummy variables) and symptoms that identified in the univariate analyses as associated variables were entered as independent variables. When age and length of time after first cardiac event were controlled for, patients who were female, with low income, and had greater functional limitation and more symptoms had worse HRQoL. Each contributed to the diminished HRQoL, accounting for 57.0% of the variance (adjusted $R^2 = .57$, $p < .001$).

Discussion

In this study, symptom recovery was explored with its investigation extending to 12 months and over after the initial cardiac

Table 4 Differences in HRQoL by Participant Characteristics (*N* = 105).

Variables		HRQoL	
		<i>M</i> ± <i>SD</i>	<i>t</i> or <i>r</i> (<i>p</i>)
Gender	Male	41.35 ± 28.21	−2.53 (.015)
	Female	55.82 ± 22.53	
Living alone	Yes	53.95 ± 25.88	1.81 (.080)
	No	42.13 ± 27.72	
Education	≤ Elementary	54.49 ± 23.33	3.38 (.001)
	≥ Middle	37.27 ± 28.41	
Occupation	No	49.88 ± 27.95	2.98 (.004)
	Yes	34.27 ± 24.36	
Monthly income(USD)	≤ 1,000	53.02 ± 26.93	4.11 (< .001)
	> 1,000	32.41 ± 24.21	
Alcohol drinking	No	47.73 ± 28.27	2.63 (.012)
	Yes	33.08 ± 22.52	
Smoking	Non/ex-smoker	44.74 ± 27.82	0.29 (.777)
	Current smoker	42.74 ± 27.59	
Exercise	None	54.50 ± 24.94	2.43 (.019)
	≥ 1 per week	40.70 ± 27.83	
NYHA class	I ^(a)	28.42 ± 22.39	23.88 (< .001) <i>a</i> < <i>b</i> < <i>c</i>
	II ^(b)	38.57 ± 21.97	
	III/IV ^(c)	65.57 ± 24.21	
No. of symptoms			0.69 (< .001)
Self-care compliance			0.01 (.445)

Notes. HRQoL = health related quality of life; NYHA = New York Heart Association.

Table 5 Predictive Factors on HRQoL Adjusted for Age and Gender.

Variables	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>	Adjusted R^2	<i>F</i> (<i>p</i>)
(Constant)	1.55	8.75		0.18		.57	35.53 (< .001)
Symptoms	4.82	0.77	.51	6.24	< .001		
Monthly income	−3.83	1.49	−.18	−2.58	.011		
NYHA class	7.14	2.59	.23	2.75	.007		
Gender	10.89	4.56	.16	2.39	.019		

Notes. HRQoL = health related quality of life; NYHA = New York Heart Association.

event in post-MI patients with left ventricular dysfunction. Longer-term evaluation of symptoms was often underestimated in research and clinical practice with the primary focus on prevention of recurrent cardiac events through enhancing self-management. We also evaluated whether symptoms adversely affect HRQoL among post-MI patients who probably experience HF symptoms with HF yet undiagnosed.

Post-MI patients in this study reported having four or more symptom experiences associated with advanced myocardial infarction among 13 symptoms on the Friedman's symptom checklist. Fatigue was the most frequent symptom, and other prevalent symptoms, which greater than half of patients had experienced, included shortness of breath on exertion, weakness, and dizziness. Those who were underwent bypass surgery [22] or had advanced HF patients [23–24] were also likely to have these common symptoms which post-MI patients largely experienced. Despite successful coronary artery bypass graft surgery, some patients continue to have post-operative fatigue 6 weeks after surgery [22]. In HF, diverse symptoms were often reported, including shortness of breath, lack of energy, pain, feeling drowsy, or dry mouth, with more than half of the 60 outpatients experiencing a mean of nine symptoms [11]. More patients with a history of HF had profound fatigue than had newly diagnosed patients [23]. However, poor recognition that fatigue may be a symptom of worsening disease often occurs in HF patients because they consider the fatigue as the part of chronic disease, part of aging, or was underestimated as weakness or tiredness [24]. Further, 56.2% of patients in the current study experienced shortness of breath with exertion which was one of common symptoms of advanced HF. Given substantial symptom experience at longer-term evaluation in post-MI patients with sustained left ventricular dysfunction, providing symptom management intervention that facilitates symptom recognition associated with worsening of the disease and assists patients seek treatment promptly is critical.

Perceptions of overall HRQoL among post-MI patients were moderately low, considering a cut-off score between 24 and 45 on the MLHFQ [25]. The HRQoL of symptomatic post-MI patients in this study was worse than that (31.6 ± 23.0) of outpatients with stable HF (*N* = 114, NYHA class I/II 83.1%, LVEF 52.9%) [26] and outpatients with ischemic heart disease (MLHFQ = 24) and alcoholic cardiomyopathy (MLHFQ = 20) [19]. However, the HRQoL of participants in this study was better than the HRQoL in hospitalized elderly patients with chronic HF (MLHFQ = 50.4 ± 19.3) [27]. The second aim was to determine whether symptom predicts HRQoL of post-MI patients, after controlling for age, gender, monthly income, functional status, and self-care compliance. The results of the present study are consistent with and extend the work that evaluated diminished HRQoL relative to symptom presentation in symptomatic patients with MI [17,20,22]. The primary aim of this study was to evaluate the differences in HRQoL by symptom experience among post-MI patients. As hypothesized, more symptomatic post-MI patients had poor HRQoL, compared to those with fewer symptoms. In past studies, patients who underwent coronary artery bypass surgery and reported post-operative fatigue had significantly poorer HRQoL as measured by the SF-36 six weeks

after the surgery, compared to those with no fatigue [22]. The findings indicated that poor HRQoL observed in the current sample might be attributable to adverse symptoms of post-MI patients. The poor HRQoL of symptomatic post-MI patients in this study was comparable to the level of fatigue in HF patients who had the most diminished HRQoL among those with other chronic heart diseases who rarely improve even with optimal treatment [24]. In HF, symptom influence, particularly fatigue on health outcomes including HRQoL has been well-documented. Fatigue was a critical symptom and responsible for poorer HRQoL [26]. Worsening functional class with higher NYHA class was a predictive factor of poorer HRQoL in systolic HF [6] and in elderly patients with chronic HF [27].

Adverse impact of symptoms on HRQoL was further supported by the results of stepwise regression analysis. Collectively, variables that included female gender, low monthly income, more symptoms, and functional limitation were significant predictors of poorer HRQoL. Those who had more symptoms were the most vulnerable to sustained poor HRQoL in post-MI patients, accounting for 38.3% of the variance in this study. It is also validated in HF patients with more symptoms associated with poorer HRQoL and accounting for 32.0% of the variance [25]. In addition, this finding is consistent with a path analysis study in that gender, financial status, regular exercise, symptoms, functional limitation (NYHA class I 17.5%, II 53.4%, III/IV 29.2%), and health perception had indirect effects on HRQoL via physical functioning and depression, collectively accounting for 51.0% of the variance among outpatients with systolic HF ($N = 103$) in Korea [9]. A particular note was that functional limitation had a significant association with poor HRQoL in patients with MI in this study who were more asymptomatic (NYHA class I 31.4%, II 35.2%, III/IV 33.3%), compared with patients with stable HF [9]. However, MI patients similarly demonstrated functional impairment, associated with cardiac symptoms while engaging in daily activities, with those with NYHA class II or III/IV having significantly worse HRQoL than those with NYHA class I. An important priority in research is to address functional limitation and diverse symptoms reported by MI patients for development of symptom management, thereby improving HRQoL.

It is noteworthy that self-care compliance was not related to HRQoL, consistent with results from past studies that reported no significant relationship between self-care and HRQoL among HF patients [10]. Another study [28] also reported no significant relationship between self-care and restenosis among post MI patients. A recent literature review indicated that it was challenging to determine self-care benefit for quality of life outcomes in HF patients [15]. The effect of self-care interventions on quality of life in HF also remained undetermined [15]. Still, self-care compliance is important in that it assists with compliance with medical treatment and prevents a second cardiac event in post-MI patients [13]. More evidence is needed to determine whether enhanced self-care ability of post-MI patients improves HRQoL and delays the deterioration of the condition.

Results of this study include a couple of implications for clinical practice. Given little attention paid to the symptoms of post-MI patients, a need for transitional care which assists post-MI patients with taking an active involvement in symptom management arises. Symptom management may also increase awareness of post-MI patients in early recognition of the worsening of the condition and prompt action so that they can get into the system earlier for treatment. Eventually, effective symptom management strategies help accomplish a desirable level of HRQL in post-MI patients. Particularly, symptomatic patients with functional limitation and those who are female and financially poor should be targeted for such transitional care or symptom management.

Despite a couple of methodological flaws associated with the design of the study, results can be provisional for development and testing of future intervention studies in larger samples. The fact that may limit the generalization of the study comes from employing a small convenient sample obtained from a single hospital. Further, with a single measurement of symptoms and HRQoL, transitional changes are less likely to be detected.

Conclusion

Post-MI patients with left ventricular dysfunction reported having approximately five symptoms on the Friedman's 13-symptom checklist. Yet, their symptom experience was often underestimated and unlikely to be reported to health care providers because the patients' ability to recognize symptom presence and/or its severity in post-MI patients is poor. Symptom experience was found to be one of the most important risk factors for poor HRQoL in this study; greater functional limitation (NYHA class III/IV), low income, and female gender also had significant associations with diminished HRQoL. However, self-care compliance was not significantly related to HRQoL. Both health care professionals and MI patients should recognize that more symptom experiences may indicate a deterioration of clinical status and possibly the condition developing into advanced stages, such as HF. Given substantial symptom experiences and associated poor HRQoL in post-MI patients, we suggest that post-MI symptom management be provided after the initial cardiac event. The symptom management would involve periodic evaluation of presence and severity of symptoms and HRQoL. In particular, post-MI patients with more symptoms and associated functional limitation, who were at greater risk for poor HRQoL, are in priority of such symptom management.

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