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Comparison of Health-related Quality of Life between American and Taiwanese Heart Failure Patients

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Abstract

Few investigators have compared health-related quality of life (HRQOL) in heart failure (HF) patients from different countries. The purposes of this study were to compare HRQOL between American (n=87) and Taiwanese (n=88) HF patients and to determine factors associated with HRQOL in both groups. In this cross-sectional survey, HRQOL was measured using the Minnesota Living with Heart Failure Questionnaire. American patients rated their HRQOL worse than did Taiwanese patients. Socio-demographics, disease severity, and symptom severity were associated with HRQOL, accounting for 42.4% of the variance in HRQOL in Americans and 57.3% in Taiwanese. Symptom severity was the most important predictor of HRQOL in both groups. Interventions targeting symptom severity could improve HF patients' HRQOL.

Keywords

Heart Failure; Health Related Quality of Life; Symptom Severity; Transculture

Background

Heart failure (HF) is an escalating public health problem that has a worldwide impact. In the United States alone, more than 5 million people have HF and an additional 550,000 are diagnosed each year. About $33.2 billion are spent each year in the care of patients with HF (Rosamond, et al., 2008). Epidemiologic evidence from other Western countries indicates that HF imposes a major societal burden due to its prevalence, morbidity, mortality, and related healthcare costs (American Heart Association, 2006; Lloyd-Jones et al., 2002; Young, 2004). In Asian countries, the growing prevalence of risk factors for atherosclerosis, coupled with the rising numbers of individuals with obesity, metabolic syndrome, and

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diabetes, suggests that HF will become a critical health problem in those countries as well. In Taiwan, cardiac disease has been the second or third leading cause of death in recent decades (Department of Health, Executive Yuan, Taiwan, R.O.C., 2007). Similar to Western countries, the economic burden from hospitalization caused by HF related diagnoses is high, as evidenced by data from the Taiwan National Health Insurance Bureau (Bureau of National Health Insurance, 2007). Because HF is the final common pathway for virtually all heart diseases, it is likely that HF incidence and prevalence will increase markedly in Taiwan in the coming years.

Despite advances in treatment, HF remains a chronic, progressive, and eventually lethal illness, which is associated with significant symptoms, most commonly dyspnea and fatigue, as the condition progresses. The course for many patients with HF is characterized by a slow downward spiral in physical functioning, punctuated by acute medical crises that often result in hospitalization and forced dependency. Therefore, goals in the treatment of HF are to relieve symptoms, improve prognosis, and increase quality of life.

Health related quality of life (HRQOL) is a multidimensional construct defined as patient’s perceptions of the impact of physical symptoms, health perceptions, and functional ability on their daily life (Wenger, 1989). Physical symptoms include disease-related symptoms and the impact of those symptoms on functional ability and health perceptions. Health perceptions correlate strongly with mortality, as well as life satisfaction and well-being. Another major component of HRQOL is functional ability, which incorporates self-care activities, interpersonal areas, social support, sleep, intellectual functioning, coping and emotions (Wenger, 1989).

Patients with HF experience physical functional losses and a variety of psychosocial and socio-economic concerns that affect overall HRQOL (Bosworth et al., 2004; Koenig, Vandermeer, Chambers, Burr-Crutchfield, & Johnson, 2006; Kuntz, 2007). Furthermore, unlike cancer which has a more predictable trajectory, HF is marked by sudden condition changes. As a result, patients with HF do not have a predictable prognosis or trajectory. Uncertainty as a result of this unpredictable trajectory can have a negative impact on patients’ overall HRQOL (Winters, 1999). The HRQOL of patients with HF is worse compared to that seen in many other chronic diseases (Díaz-Domínguez, Pérez-Bernal, Pérez-San-Gregorio, & Martín-Rodríguez, 2006; Juenger et al., 2002). In view of the extensive physical, functional, emotional, and social ramifications of HF, researchers have demonstrated the value of HRQOL in predicting patients’ use of health services and mortality (Belardinelli, Georgiou, Cianci, & Purcaro, 1999; Hägglund, Boman, Olofsson, & Brulin, 2007; Rodríguez-Artalejo et al., 2005). Understanding the correlates of HRQOL in HF patients is crucial for developing effective interventions to minimize the adverse effects of HF on HRQOL.

Heart failure has global consequences, and cross-cultural comparisons will help clinicians and researchers gain perspective on diverse cultures’ effect on HF. Additionally, we live in an increasingly heterogeneous world where cultural differences are common even within countries that were formerly relatively homogenous. Despite the need for greater understanding of cultural differences, there are few studies comparing HRQOL between cultures.

The purpose of the study was to examine differences in HRQOL in patients with HF from the U.S. and Taiwan. The specific aims of the study were to: 1) compare differences in HRQOL between American and Taiwanese patients with HF; and 2) identify socio-demographic, disease severity, and symptom severity predictors of HRQOL in patients with

HF from the U. S. and Taiwan. We hypothesized that HRQOL would be different in patients from the U. S. and Taiwan because of cultural differences in views about health.

Methods

Design, Sample and Setting

A cross-sectional, correlational research design was used in this survey study. The dependent variable was HRQOL, and the independent variables were the following: socio-demographic characteristics (i.e., age, gender, living arrangement, and marital status), disease severity (i.e., left ventricular ejection fraction [LVEF], and New York Heart Association [NYHA] functional class), and symptom severity. A total of 175 patients with HF were included in the study, 87 from the U. S. and 88 from Taiwan. To be included in the study, individuals needed to be over the age of 21 with a diagnosis of confirmed HF that was verified by a cardiologist. Patients were excluded from the study if they had a history of cerebral vascular accident, recent myocardial infarction (within the previous 6 months), or coexisting terminal disease.

Measurement

Health related quality of life

Minnesota living with heart failure questionnaire: The Minnesota Living with Heart Failure Questionnaire (MLHFQ) was used to measure HRQOL in patients from both Taiwan and the U. S. The MLHFQ is a 21-item, disease-specific measure of HRQOL that was developed specifically for use in patients with HF. The MLHFQ has a total scale score that consists of the sum of all 21 items, and two subscale scores. The subscales are the physical subscale that consists of the sum of 8 items and the emotional subscale that consists of the sum of 5 items. Each item is rated on a scale from 0 (no impact on the individual's HRQOL) to 5 (most negative impact on HRQOL). Higher scores indicate worse HRQOL. Each scale in this instrument is scored by adding the ratings of the items that belong to the scale. Thus the possible range is from 0 to 105 for the total scale, 0 to 40 for the physical subscale, and 0 to 25 for the emotional subscale. Use of the MLHFQ was permitted by the MAPI Research Trust. The MLHFQ was used to measure HF patients' HRQOL, which is defined as an individual's subjective perception of the effects of a clinical condition or its treatment on his/her daily life (Coelho et al., 2005; Heo, Moser, Riegel, Hall, & Christman, 2005b). The MLHFQ has acceptable reliability and validity, with Cronbach α ranging from .87 to .93. (Heo, Moser, Riegel, Hall, & Christman, 2005a; Heo et al., 2005b; Riegel et al., 2002; Scherer et al., 2007).

Socio-demographic data—The socio-demographic questionnaire included participants' age, gender, living arrangement, and marital status. Socio-demographic data were collected from the patient by interview.

Disease severity—Disease severity was assessed using NYHA functional class and LVEF. The NYHA functional classification was used to assess the functional status of patients with HF. This measure is used commonly in HF research to represent illness severity. The NYHA functional classification contains four classes ranging from I (no limitation of physical activity caused by cardiac disease) to IV (inability to carry on any physical activity without discomfort; symptoms even at rest) (American Heart Association, May, 14, 2007; Bennett, Riegel, Bittner, & Nichols, 2002; Karapolat, Durmaz, Nalbantgil, & Durmaz, 2006; Masoudi et al., 2004). In this study, NYHA classification was determined and documented by the trained nurse research assistant at the time of the assessment. Based on patients' report of how able they are to perform their usual activities they are assigned a NYHA classification of I (ordinary physical activity causes no symptoms of fatigue, dyspnea, angina or palpitations), II (symptoms with ordinary physical activity that slightly limit physical activity), III (symptoms occur with less than ordinary physical activity and markedly limit activity) or IV (symptoms occur even at rest) (American Heart Association, May, 14, 2007). Reproducibility both among different raters (inter-rater reliability) and across the same rater (intra-rater reliability) was insured by training raters and testing them in sample patients until inter-rater agreement was 100%. This process was done at initiation of the study and whenever new raters were hired. Data on LVEF were extracted from the medical record using the most recent data from echocardiography or cardiac catheterization.

Symptom severity—The Modified Pulmonary Function Status and Dyspnea Questionnaire (PFSDQ-M) was used to measure Taiwanese HF patients' symptom severity, and the Dyspnea/Fatigue Index was used to measure American HF patients' symptom severity. Symptom severity was defined as the level and intensity of the two most common symptoms of HF, dyspnea and fatigue. Symptom severity was measured differently in the two countries in order to ensure use of the most reliable and valid instruments in those countries. There was no Chinese equivalence of the instrument used in the American HF patients, so a similar instrument that has excellent reliability and validity in Chinese and that demonstrated good cultural equivalence was used.

The modified pulmonary function status and dyspnea questionnaire: The PFSDQ-M is a 40-item measure of the severity of dyspnea, fatigue, and activity change as a result of those symptoms. The mean score ranges from 0 to 10. Higher scores indicate more severe symptoms. The psychometric properties of the PFSDQ-M have been established in English and Chinese speaking populations (Caroci Ade & Lareau, 2004; Huang, Moser, Hwang, & Lareau, 2007; Lareau, Meek, & Roos, 1998; Meek, Lareau, & Anderson, 2001; Meek & Lareau, 2003; Meek, Lareau, & Hu, 2003).

The dyspnea and fatigue index: The dyspnea and fatigue index was used to measure American HF patients' symptoms. The Dyspnea/Fatigue Index is a 3-item, 5-point Likert scale instrument used for measuring the severity of dyspnea, fatigue, and activity change as a result of symptoms. A scale from 0 to 4 is used in the Dyspnea-Fatigue Index, which assesses the magnitude of task that produces dyspnea and/or fatigue (0, symptomatic at rest; 4, symptomatic only with extraordinary activity), the pace of task that produces dyspnea and/or fatigue (0, symptomatic at rest; 4, all activities performed at normal pace), and the level of functional impairment (0, very severe; 4, none). Therefore, the composite index can range from 0 (severely limited) to 12(no limitation). Excellent psychometric properties have been demonstrated for this index (Corvera-Tindel, Doering, Woo, Khan, & Dracup, 2004; Jordán et al., 2003; Shah et al., 2002). In order to render the scores from different instruments (i. e. the PFSDQ-M, MLHFQ, and the Dyspnea/Fatigue Index) comparable, scores on the Dyspnea/Fatigue Index were reversed so that higher scores indicated worse symptom of dyspnea and fatigue.

Instrument translation—The Chinese PFSDQ-M and MLHFQ for Taiwanese HF patients in this study were translated using a well-defined translation and back-translation process (Brislin, 1970). Monolingual and bilingual experts reviewed questionnaires in order to evaluate each item's equivalence. Language syntax difference and translation problems were identified and items were revised. Prior to use, field testing was conducted and excellent psychometric properties were confirmed (Ho, Clochesy, Madigan, & Liu, 2007; Huang et al., 2007). The Cronbach's alpha was 0.93 for the PFSDQ-M and 0.93–0.95 for the total and subscales of the MLHFQ.

Data Collection Procedures

Approval to conduct the study was obtained from the appropriate institutional review boards of both sites: the National Taiwan University Hospital and the University of Kentucky. Informed written consent was obtained from each patient after thorough explanation of the study by the investigator. Eligible adults with HF were identified and invited to participate in the current study by trained nurse research assistants. Patients completed the questionnaires with the nurse research assistant in attendance and available to answer any questions. In some cases, the nurse research assistant read the questionnaires to patients. In general, it took about 20 minutes to complete the questionnaires.

Data Analysis

Data were analyzed using SAS (Statistical Analysis Software) version 8. Descriptive statistics including means, standard deviations, frequencies, and percentages were used to characterize the sample. T-tests or chi-square tests were used to examine differences in individual characteristics between American and Taiwanese patients. For specific aim 1, the independent t-test was used to examine differences in the HRQOL of HF patients in the U. S. and Taiwan. For specific aim 2, hierarchical multiple regression was used to identify predictors of HRQOL in each group. In each model, the dependent variable was HRQOL; independent variables are entered in three blocks. Block one consisted of demographic factors; block two of disease severity variables; and block three of symptom severity. Two separate hierarchical regression analyses were performed, one for American and the other one for Taiwanese HF patients. The total variance and variance changes at each step of the model were examined. A p value of less than .05 was considered statistically significant.

Results

One hundred and seventy-five patients with HF were included in the current study, 87 in the U. S. and 88 in Taiwan. The characteristics of the participants are displayed in Table 1. Because different instruments were used to measure symptom severity in patients with HF from both groups, symptoms of dyspnea and fatigue are shown as Table 1 without comparison. The groups were comparable except that Taiwanese patients less often lived alone than American patients.

Patients with HF in the U. S. reported worse HRQOL than patients with HF in Taiwan. There were differences between the groups on several items of the MLHFQ, on the total score and on the physical subscale (Table 2). With one exception, where the groups differed, American patients reported worse scores than Taiwanese patients. The one exception was the item on the impact of HF on working to earn a living; Taiwanese patients rated their HRQOL worse.

The results of the hierarchical regression analyses with models for the total score, physical subscale, and emotional subscale for American and Taiwanese patients with HF are presented in Table 3 and 4 respectively. For American HF patients, when the demographic factors were entered, age explained a significant proportion of the total variance (beta= −0.53, adjusted R^2 change = 0.09, $p< .05$) only in MLHFQ total score. When disease severity factors were entered in the next step, age and NYHA functional class explained a significant proportion of the total variance in total, physical, and emotional MLHFQ scores. The adjusted R^2 increased when disease severity factors were entered by 0.16, 0.21, and 0.11 on the total, physical, and emotional MLHFQ scores, respectively. In the final models after symptom severity was added, age and symptom burden explained a significant proportion of the total variance in total, physical, and emotional MLHFQ scores, ultimately accounting for 42%, 35%, and 45% of the total variance of the scores, respectively. Lower age and worse symptoms of dyspnea and fatigue were associated with worse HRQOL.

For Taiwanese patients, only symptom severity was significantly associated with HRQOL, ultimately accounting for 57%, 54%, and 44% of the total variance in total, physical, and emotional HRQOL (see Table 4). Worse symptom severity was associated with poorer HRQOL. Symptom severity, accounting for 17.5% of the total variance in the U.S. group and 53.2% in the Taiwanese group, was the most significant predictor of HRQOL in both groups.

Discussion

The results of our study provide evidence of substantial differences in HRQOL across American and Taiwanese cultures. In this study, HRQOL among patients in the U. S. was more impaired than in Taiwanese patients, particularly in the physical dimension. We hypothesized that there would be differences in HRQOL based on cultural differences such as those related to family structure, living environment and activity levels in people from these two different societies.

Differences in social support between the two cultures may play a specific role in producing difference in HRQOL. Social support refers to the social resources that individuals perceive to be available or that are actually provided to them by nonprofessionals in the context of both formal support groups and informal helping relationships (Cohen, Gottlieb, & Underwood, 2000). According to the statistical update from the Taiwanese government, there are 49,728 older adults who live alone in Taiwan, accounting for only 2.20% of the total elderly population, substantially lower than in the U. S. In the U. S., 10,209,315 elderly individuals live alone, accounting for 27.45% of the total elderly population (Directorate-General of Budget, Accounting and Statistics, Executive Yuan, R.O. C, 2007; The U. S. Census Bureau, 2007). Our data related to living status mirrors these statistics. Those who live with another person commonly have support available. Under these circumstances, HRQOL may be better (Bosworth et al., 2004; Yu, Lee, & Woo, 2004).

Another factor that may produce cultural differences in HRQOL is financial support, particularly for healthcare problems. Patients with HF in Taiwan are entirely covered by National Health Insurance, thus they have little financial burden from medical care. Although patients with HF are affected by the same physical impairments and deteriorating self care ability in both countries, their subjective perceptions may be modified by cultural influences that include living situation and financial support.

The Taiwanese are thought to be the most sedentary people in the world. According to a recent survey of people 18 to 65 years old in Taiwan, the amount of exercise for Taiwanese males and females place them in the last rank compared to 20 other countries studied. The Taiwanese not only do not exercise, but also perform a low level of physical activity in daily life (National Department of Health, 2007). It is typical for older Taiwanese individuals to spend their leisure time in static activities, such as watching television, playing chess, talking or just sitting (Department of Statistic, Ministry of the Interior, Taiwan, 2008). Given their stationary lifestyle, Taiwanese HF patients may not feel as functionally impaired as American HF patients who may have been more active before becoming disabled by HF.

The HRQOL of patients with HF is likely affected by many factors. It is important to identify the most significant factors in order to improve patients’ HRQOL. If specific factors are found to be associated with HRQOL, it will be possible to design interventions targeting these factors. If the factor is not modifiable, it can serve as a marker for identifying those most likely to be at risk for poor HRQOL. In this study, age was a significant predictor of

HRQOL, which was consistent with findings from other studies (Hou et al., 2004; Masoudi et al., 2004). No other socio-demographic or disease severity variables were predictors of HRQOL. Symptom severity, however, was an independent predictor of HRQOL in both American and Taiwanese patients.

In this study, gender, living arrangement, marital status, and disease severity were not significant predictors of HRQOL. Some investigators have found gender to be a predictor of HRQOL in that women report worse HRQOL (Luttik, Jaarsma, Veeger, & van Veldhuisen, 2006; Riedinger et al., 2001; Stromberg & Martensson, 2003). However, in other investigations, when functional status is controlled, gender differences are no longer apparent (Riegel et al., 2003).

Symptom severity was the most important predictor of HRQOL in Taiwanese and American patients. This finding is consistent with previous studies. For example, after controlling for age, gender, hematocrit and comorbidities, symptom status was a key predictor of HRQOL in one study (Sousa & Williamson, 2003). Lower age, worse functional status, total symptom prevalence, and total symptom burden were associated with worse HRQOL in another study, accounting for 67% of the variance in HRQOL in patients with advanced HF (Zambroski, Moser, Bhat, & Ziegler, 2005). In another study, physical symptom status was the strongest predictor of HRQOL in patients with HF and in healthy elders (Heo, Moser, Lennie, Zambroski, & Chung, 2007). Symptom burden has an equally negative impact on HRQOL in patients with preserved and low LVEF (Lewis et al., 2007). This suggests that attention to improving symptom status to enhance HRQOL is an important treatment objective in all HF patients.

To date, there have been no studies of the relationship of HRQOL to physical symptoms in HF patients in the Taiwanese population. A new finding identified in this study was the importance of symptom severity to HRQOL in Taiwanese patients. Thus, despite vast cultural differences between Taiwanese and American patients, and large differences in HRQOL, the major influence on HRQOL was the same in both groups. Symptom severity accounted for a smaller percentage of the total variance in Americans compared to the Taiwanese group, although it was an important predictor in both groups.

These findings about the impact of symptom severity are consistent with those of previous studies. Physical symptom status was the strongest predictor of HRQOL in both healthy elders and in HF patients. Heo and associates (Heo et al., 2007) examined HRQOL and factors associated with it in older adults with and without HF. HRQOL was substantially worse among older adults with HF than among older adults without HF, and older adults with HF had more severe physical and emotional symptoms, poorer functional status, and worse health perceptions. Yet, physical symptom status was the strongest predictor of HRQOL in both groups. Elderly patients in primary healthcare with confirmed HF and patients with symptoms similar to those seen in HF perceived they had a significantly worse physical HRQOL and more general and physical fatigue than an age- and sex-matched control group without cardiac disease (Hägglund et al., 2007). The similarity of findings among groups indicates the importance of symptom severity to HRQOL. Our findings provide further evidence for the importance of symptom management in HF.

Limitations

This was a secondary analysis of existing data. As such, two different instruments were used to measure symptom severity in this study and these instruments may not be comparable. However, our finding that symptom severity was the most important predictor of HRQOL in both groups suggests that the two instruments performed comparably in this study. Another limitation of our study was our inability to determine why HRQOL was worse in the U.S.

than in Taiwan. More research in the future needs to be conducted to determine why HRQOL might be worse in American compared to Taiwanese patients. Future researchers should investigate whether the expression of HRQOL is culturally different or whether there are true differences in HRQOL.

Conclusion

In patients with HF, HRQOL is more impaired in U. S. patients than in Taiwanese patients, especially in the physical dimension. Despite this difference, the severity of the symptoms of dyspnea and fatigue was the most important predictor of HRQOL in both groups. Therefore, healthcare providers should assess the severity of their patients' physical symptoms and provide interventions to improve symptom status. Our findings suggest that interventions targeting physical symptoms in culturally diverse groups of patients with HF could improve HRQOL in all.

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Table 1

Characteristics of the Sample

Sample Information	**Total(N=175)**	**Taiwanese(N=88)**	**American(N=87)**
	Mean ± SD or Frequency		
Age(years)	70.1 ± 11.7	67.7 ± 12.9	72.5 ± 10.8
Male	94 (53.7%)	49 (55.7%)	45 (48.3%)
Living arrangement			
Live with family	126 (72.0%)	82 (93.2%)	44 (50.6%)*
Live alone	49 (28.0%)	6 (6.8%)	43 (49.4%)*
Marital status			
With spouse	86 (49.1%)	47 (53.4%)	39 (44.8%)
Without spouse	89 (50.9%)	41 (46.6%)	48 (55.2%)
Ejection Fraction	40.4 ± 16.8	42.6 ± 18.2	38.1 ± 15.0
NYHA			
I/II	78 (44.6%)	37 (42.0%)	41 (47.1%)
III/IV	97 (55.4%)	51 (58.0%)	46 (52.9%)
Dyspnea/Fatigue Scores			
The PFSDQ-M		2.5 ± 2.8	--
The Dyspnea/Fatigue Index		--	7.0 ± 3.3

Note: NYHA= New York Heart Association Functional Classification; PFSDQ-M: Pulmonary Function Status and Dyspnea Questionnaire

*p<.05

Table 2

Comparison of Health Related Quality of Life between Patients from Two Countries

Items/Subscales	Taiwanese (N=88)	American (N=87)
	Mean(SD)	
1. Causing swelling your ankles, legs, etc.	1.5 (1.8)	2.0 (2.0)
2. Making you sit or lie down to rest during the day	2.1 (1.7)	2.9 (1.8)*
3. Making walking about or climbing stairs difficult	3.2 (2.0)	3.1 (1.7)
4. Making working around the house or yard difficult	1.5 (1.8)	3.1(1.7)*
5. Making going away places away from home difficult	1.9 (2.0)	2.5(1.7)*
6. Making sleeping well at night difficult	2.5 (2.0)	2.5(1.9)
7. Making your relating to or doing things with your friends or family difficult	1.3 (1.7)	2.9 (1.7)*
8. Making working to earn a living difficult	1.1 (1.9)	0.6 (1.5)*
9. Making recreational pastimes, sports or hobbies difficult	1.9 (2.0)	2.6 (2.0)*
10. Making sexual activities difficult	1.2 (1.9)	1.2 (1.9)
11. Making you eat less of the foods you like	2.3 (1.9)	2.7 (1.7)
12. Making you short of breath	3.0 (2.0)	3.3 (1.8)
13. Making you tired, fatigued or low on energy	2.9 (1.8)	3.6 (1.5)*
14. Making you stay in a hospital	3.0 (1.8)	3.3 (1.8)
15. Costing you money for medical care	2.4 (2.0)	2.8 (2.0)
16. Side effects from medications	1.2 (1.8)	1.8 (1.8)*
17. Making you feel you are a burden to your family	2.3 (1.9)	2.0 (1.9)
18. Making you feel a loss of self-control in your life	2.0 (1.8)	2.6 (1.8)*
19. Making you worry	2.8 (1.9)	2.9 (2.0)
20. Making it difficult for you to concentrate or remember things	1.9 (1.8)	2.2 (1.8)
21. Making you feel depressed	2.5 (1.8)	2.3 (1.8)
Physical dimension	17.7 (10.8)	23.6 (10.9)*
Emotional dimension	11.4 (7.4)	11.9 (7.0)
Total score	43.8 (25.1)	52.6 (22.7)*

*P< .05

Table 3

Regression Models Predicting Health-Related Quality of Life-American

Independent Variables	Total-HRQOL			Physical-HRQOL			Emotional-HRQOL		
	Block 1	**Block 2**	**Block 3**	**Block 1**	**Block 2**	**Block 3**	**Block 1**	**Block 2**	**Block 3**
Demographic factors									
Age	−0.53*	−0.82*	−0.83*	−0.15	−0.31*	−0.32*	−0.12	−0.19*	−0.20*
Gender	5.01	0.76	−0.90	1.62	−0.51	−1.12	2.47	1.48	0.82
Marital	5.60	4.75	4.36	1.33	0.76	0.62	1.53	1.34	1.18
Living arrangement	−2.39	−1.96	−1.63	−1.89	−1.68	−1.55	0.06	0.16	0.30
Severity of disease									
Ejection fraction		0.23	0.22		0.08	0.07		0.06	0.05
Functional class		19.33*	1.85		10.79*	4.36		4.47*	−2.46
Symptom			5.78*			2.13*			2.29*
Constant	86.96*	91.67*	16.14*	34.19*	38.52*	27.99*	18.99*	19.99*	8.64
R-Square	0.09	0.25	0.42	0.04	0.25	0.35	0.07	0.18	0.45

[*] $p<.05$

Table 4

Regression Models Predicting Health-Related Quality of Life- Taiwanese

Independent Variables	Total-HRQOL			Physical-HRQOL			Emotional-HRQOL		
	Block 1	**Block 2**	**Block 3**	**Block 1**	**Block 2**	**Block 3**	**Block 1**	**Block 2**	**Block 3**
Demographic factors									
Age	−0.32	−0.26	−0.33	−0.03	−0.03	−0.07	−0.12	−0.09	−0.09
Gender	0.33	0.28	−8.85	3.53	3.54	−0.10	−0.38	−0.72	−3.29
Marital	3.24	3.35	4.25	0.31	0.30	1.05	1.29	1.77	1.57
Living arrangement	−3.25	−5.73	−5.76	−4.26	−4.42	−5.04	2.01	−0.45	−2.59
Severity of disease									
Ejection fraction		−0.14	−0.08		−0.01	0.00		−0.07	−0.04
Functional class		1.82	−0.55		0.08	−0.94		2.63	2.25
Symptom			6.98*			2.94*			1.58*
Constant	66.44*	68.81*	55.59*	22.07*	22.39*	17.99*	17.46*	18.68*	15.62*
Adjusted R^2	0.03	0.04	0.57	0.04	0.04	0.54	0.07	0.12	0.44

* $p < .05$