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'It could be worse ... lot's worse!' Why health-related quality of life is better in older compared with younger individuals with heart failure

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Abstract

Background: health-related quality of life (HRQOL) is markedly impaired in patients with heart failure (HF). Despite worse prognosis and physical status, older patients have better HRQOL than younger patients.

Objective: to determine reasons for differences in HRQOL in older compared with younger HF patients.

Methods: a mixed methods approach was used. HRQOL was assessed using the Minnesota Living with HF Questionnaire and compared among HF patients ($n = 603$) in four age groups (≤ 53 , 54–62, 63–70 and ≥ 71 years). Socio-demographic/clinical and psychological factors related to HRQOL were determined in four groups using multiple regressions. Patients ($n = 20$) described their views of HRQOL during semi-structured interviews.

Results: HRQOL was worse in the youngest group, and best in the two oldest groups. The youngest group reported higher levels of depression and anxiety than the oldest group. Anxiety, depression and functional capacity predicted HRQOL in all age groups. Qualitatively, patients in all age groups acknowledged the negative impact of HF on HRQOL; nonetheless older patients reported that their HRQOL exceeded their expectations for their age. Younger patients bemoaned the loss of activities and roles, and reported their HRQOL as poor.

Conclusions: better HRQOL among older HF patients is the result, in part, of better psychosocial status. The major factor driving better HRQOL among older patients is a change with advancing age in expectations about what constitutes good HRQOL.

Keywords: *health-related quality of life, older adults, anxiety, depression, older people*

Introduction

Heart failure (HF) is a chronic, serious and expensive worldwide health problem that is notable for its strikingly negative impact on patients' health-related quality of life (HRQOL) [1–3]. Indeed, poor HRQOL is a hallmark of HF [4, 5]. Of interest to clinicians and researchers is the recognised phenomenon of better HRQOL in older compared with younger HF patients [6].

The finding that older patients with HF report better HRQOL is intriguing given that elders have worse physical status and prognosis than younger patients [7, 8]. Reasons for the better HRQOL in elders are unknown. Identification of mechanisms underlying this phenomenon may provide important insights for developing interventions to improve HRQOL for all patients with HF.

A mixed methods approach was used to determine reasons for age-related differences in HRQOL. We used quantitative and qualitative approaches to address the following objectives: (i) to quantitatively compare HRQOL among HF patients in four age groups; (ii) to identify significant sociodemographic (i.e. gender, ethnicity, education levels and marital status), clinical [i.e. New York Heart Association (NYHA) class, ejection fraction and functional capacity], and psychosocial (i.e. depression and anxiety) factors related to HRQOL within the four age groups and (iii) to gain insight into HF patients' perceptions regarding HRQOL using semi-structured qualitative interviews. We hypothesised that older patients with HF would have better HRQOL than younger patients with HF because of their previously documented better psychosocial status [9] and altered expectations with ageing [10].

Method

Design

Institutional review board approval was obtained and all participants gave signed, informed consent. Quantitative data were obtained using cross-sectional survey techniques, and qualitative data were obtained using a qualitative descriptive method [11].

Participants and setting

Data were obtained from participants who were enrolled in the HF HRQOL Collaborative [12, 13]. Patients were included who met these inclusion criteria: (i) diagnosis of HF; (ii) community-dwelling; (iii) free of major cognitive impairment and (iv) free of major life-threatening comorbidities expected to result in death within 12 months.

Data for the qualitative portion of this study were obtained from 20 individuals in the HF HRQOL Collaborative. The individuals who participated in the qualitative study were purposively selected to provide a group younger than 65 and a group older than 65 years of age, and met the same inclusion criteria described above.

Measurement

All instruments used have well-established reliability and validity in HF patients and across a variety of ages [14–19].

Health-related quality of life. HRQOL was measured using the 21-item Minnesota Living with HF Questionnaire (MLHFQ) [18]. The MLHFQ measures patient perceptions

of the impact of HF on physical, psychological and social aspects of their lives. Higher scores indicate worse HRQOL.

Anxiety. Anxiety was assessed with the anxiety subscale of the Brief Symptom Inventory [20]. Higher scores indicate higher anxiety.

Depressive symptoms. Depressive symptoms were assessed using the Patient Health Questionnaire (PHQ-9) [21]. Each item corresponds to one of nine symptoms for the major depressive disorder criteria in the Diagnostic and Statistical Manual of Mental Disorders-IV. Higher scores indicate higher levels of depressive symptoms.

Functional capacity. Functional capacity was measured with the Duke Activity Status Index (DASI) [19]. The items in the DASI represent daily activities such as performed during personal care, ambulation and household tasks. Each item is weighted by the estimated metabolic equivalents of task level associated with the activity; higher scores denote greater functional capacity.

Clinical and demographic variables. Comorbidity scores were measured using the Charlson comorbidity index [22]. NYHA functional class was evaluated via structured patient interviews. Socio-demographic and clinical data were collected from a standard questionnaire and medical records.

Qualitative interview

To obtain data that would illuminate why observed differences exist between younger and older HF patients, we asked participants to respond to the following open-ended questions during interviews: (i) what does HRQOL mean to you; (ii) how would you define HRQOL?; (iii) what things influence your HRQOL? and (iv) describe your current HRQOL. Each interview was conducted individually in patients' homes. All interviews were audio-taped and transcribed verbatim.

Data analysis

Quantitative data were analysed using SAS 9.2 (SAS Institute, Inc., NC, USA). Patients were categorised into four groups by the quartile of age within this sample (i.e. aged ≤ 53 , 54–62, 63–70 and ≥ 71 years). To compare characteristics among the four age groups we conducted a Chi-square test for categorical variables and analysis of variance (ANOVA) for continuous variables followed by the Bonferroni *post hoc* test if ANOVA was significant.

Multiple linear regression analyses in each age group were conducted to determine independent predictors of HRQOL. The variables included in the model were age, gender, marital status, ethnicity, education level, NYHA class, ejection fraction, body mass index, depressive symptoms, anxiety and functional capacity [6, 23]. All variables were forced into the model for

simultaneous control. The assumptions of multiple linear regression analyses were examined by studentised residuals plots of the model, normality probability plots and the Kolmogorov–Smirnov test. There were neither violations of the assumptions nor were there problems with multicollinearity.

Qualitative data were analysed using conventional content analysis [24]. This process included summarising information provided through the interviews to identify themes elucidating participants' perspectives. A coding scheme was derived based on emerging themes. An iterative process of interviewing, reading, coding, rereading, recoding and discussing codes with co-investigators was used to supplement and refine the coding scheme. The agreed upon codes were grouped into larger descriptive categories by investigators.

Results

Quantitative findings

Sample characteristics

A total of 603 patients were included in this analysis (Table 1). Significant group differences among the age quartiles were observed in marital status, ethnicity, body mass index, ejection fraction, and scores of HRQOL, depressive symptoms and anxiety. Patients in the youngest group (age ≤ 53 years) were more obese and had worse HRQOL and higher levels of anxiety than patients in the two oldest groups (age of 63–70 years and ≥ 71 years, respectively). Patients in the youngest group had lower ejection fraction and higher levels of depressive symptoms compared with patients in the age group of 63–70 years.

Predictors of health-related quality of life in four age groups

Multiple linear regression models by age quartile are presented in Table 2. The regression model in patients in the youngest group explained 66% of the total variance in MLHFQ scores. Scores of depressive symptoms, anxiety and functional capacity were independent predictors of MLHFQ scores. Higher levels of depressive symptoms and anxiety and more limited functional capacity were associated with worse HRQOL. In the two middle age groups (age 54–62 and 63–70 years) identical predictors of HRQOL were observed, which were marital status and scores of depressive symptoms, anxiety and functional capacity, explaining 62 and 68% of the variance in MLHFQ scores, respectively. In these two age groups, patients who were married or cohabitating were more likely to have worse HRQOL than patients who were single, divorced or widowed. Worse HRQOL was independently predicted by higher levels of depressive symptoms and anxiety and more impaired functional capacity.

In the oldest age group (age ≥ 71 years) 56% of the total variance of the MLHFQ scores was explained by the regression model. Poorer HRQOL was significantly associated with higher scores of depressive symptoms and anxiety and reduced functional capacity.

Table 1. Sample characteristics (*n* = 603)

	Total (<i>n</i> = 603)	Quartile 1 (<i>n</i> = 154)	Quartile 2 (<i>n</i> = 163)	Quartile 3 (<i>n</i> = 147)	Quartile 4 (<i>n</i> = 139)	<i>P</i> -value
	Mean (SD) or <i>n</i> (%)					
Age, years	61.0 (12.5)	44.8 (7.5)	58.2 (2.5)	66.2 (2.2)	76.9 (4.5)	<0.0001
Gender (%)						
Male	417 (69.2)	106 (68.8)	120 (73.6)	101 (68.7)	90 (64.7)	0.4219
Female	186 (30.8)	48 (31.2)	43 (26.4)	46 (31.3)	49 (35.3)	
Marital status (%)						
Single/divorced/widowed	269 (44.6)	90 (58.4)	66 (40.5)	53 (36.1)	60 (43.2)	0.0006
Married/co-habiting	334 (55.4)	64 (41.6)	97 (59.5)	94 (63.9)	79 (56.8)	
Ethnicity (%)						
Caucasian	484 (80.3)	101 (65.6)	133 (81.6)	126 (85.7)	124 (89.2)	<0.0001
Others	119 (19.7)	53 (34.4)	30 (18.4)	21 (14.3)	15 (10.8)	
Education, years	13.3 (3.2)	13.4 (2.8)	13.2 (3.2)	13.1 (3.4)	13.3 (3.5)	0.9344
NYHA class (%)						
I/II	242 (40.1)	64 (41.6)	71 (43.6)	57 (38.8)	50 (36.0)	0.5639
III/IV	361 (59.9)	90 (58.4)	92 (56.4)	90 (61.2)	89 (64.0)	
Ischemic aetiology (<i>n</i> = 594)	423 (71.2)	97 (63.8)	115 (71.0)	107 (74.3)	104 (76.5)	0.0871
Ejection fraction, %	30.2 (14.5)	27.9 (14.6)	29.4 (12.8)	30.6 (14.8)	33.2 (15.4)	0.0136
Months with diagnosis of heart failure	81.1 (83.3)	73.6 (77.8)	78.6 (87.0)	83.9 (70.5)	89.4 (90.8)	0.18
Comorbidity scores	3.3 (2.1)	3.2 (2.3)	3.2 (2.0)	3.4 (2.1)	3.5 (2.1)	0.3378
Body mass index, kg/m ²	30.0 (7.2)	32.2 (8.6)	31.1 (6.7)	28.8 (6.3)	27.8 (5.9)	<0.0001
MLHFQ scores	47.2 (26.7)	54.5 (28.0)	49.5 (27.4)	43.3 (26.1)	40.4 (22.8)	<0.0001
PHQ-9 scores	7.8 (6.1)	9.1 (6.5)	7.7 (6.2)	7.5 (6.1)	6.6 (5.1)	0.0068
BSI-anxiety scores	0.9 (0.9)	1.1 (1.0)	0.9 (1.0)	0.7 (0.9)	0.6 (0.7)	<0.0001
Duke activity status index scores	12.8 (12.6)	13.5 (13.7)	12.6 (12.8)	13.4 (12.7)	11.5 (10.9)	0.5319

Quartile 1: age of ≤53; Quartile 2: age of 54–62; Quartile 3: age of 63–70; Quartile 4: age of ≥71 NYHA, New York Heart Association; MLHFQ, Minnesota Living with Heart Failure Questionnaire; PHQ-9, the Patient Health Questionnaire-9; BSI-anxiety, Brief Symptom Inventory-anxiety.

Post hoc test results: age, Quartile 1 differs from quartiles 2, 3 and 4. BMI: Quartile 1 differs from quartiles 3 and 4; quartile 2 differs from quartiles 3 and 4. MLHFQ scores: Quartile 1 differs from quartiles 3 and 4 and quartile 2 differs from quartiles 3. Ejection fraction and PHQ-9 scores: Quartile 1 differs from quartile 4. BSI-anxiety scores: Quartile 1 differs from quartiles 3 and 4 and quartile 2 differs from quartile 4.

Table 2. Multiple regression results for the Minnesota living with heart failure scores by age groups (*n* = 603)

Variables	Quartile 1 (<i>n</i> = 154)		Quartile 2 (<i>n</i> = 163)		Quartile 3 (<i>n</i> = 147)		Quartile 4 (<i>n</i> = 139)	
	Standardised β	<i>P</i> -value	Standardised β	<i>P</i> -value	Standardised β	<i>P</i> -value	Standardised β	<i>P</i> -value
Age	-0.13	0.47	-0.17	0.75	0.46	0.43	0.10	0.75
Female ^a	-2.76	0.38	-4.76	0.14	2.81	0.34	-5.96	0.05
Married/cohabiting ^b	-1.39	0.62	9.56	0.001	5.66	0.04	-2.22	0.44
Caucasian	-4.78	0.10	-1.89	0.60	-3.54	0.33	4.81	0.28
Education	0.20	0.68	0.15	0.73	0.48	0.20	-0.22	0.58
NYHA class III/IV ^d	6.60	0.05	0.93	0.76	0.37	0.90	3.18	0.33
Ejection fraction	-0.13	0.26	-0.14	0.22	-0.02	0.85	0.02	0.81
Body mass index	0.13	0.42	0.39	0.06	0.08	0.69	0.21	0.35
PHQ-9 scores	1.52	<0.001	1.99	<0.001	2.41	<0.001	1.64	<0.001
BSI-anxiety scores	5.72	0.001	4.76	0.01	4.05	0.02	4.84	0.048
Duke activity level scores	-0.77	<0.001	-0.81	<0.001	-0.58	<0.001	-0.87	<0.001
Adjusted R ² (model <i>P</i> -value)	0.66 (<0.001)	0.62 (<0.001)	0.68 (<0.001)	0.56 (<0.001)				

Quartile 1: age of ≤53; Quartile 2: age of 54–62; Quartile 3: age of 63–70; Quartile 4: age of ≥71.

NYHA, New York Heart Association; MLHFQ, Minnesota Living with Heart Failure Questionnaire; PHQ-9, the Patient Health Questionnaire-9; BSI-anxiety, Brief Symptom Inventory-anxiety.

^aMale.

^bSingle/divorced/ widowed.

^cAll other.

^dNYHA class I/II.

Qualitative findings

Definition of health-related quality of life and factors affecting health-related quality of life: comparison of the perspectives of younger and older patients

Patients (Table 3) described HRQOL as consisting of happiness, ability to perform desired activities and relationships with others. As one patient stated, ‘... yes, yes, quality of life means ... how happy, content you are, doing what you want to do ... everything you want to do ... being able to ... being with ... being with loved ones and friends if you want ...’. The following factors were defined by patients as affecting HRQOL: spirituality, psychological factors, economic status, health status, social support and health-related behaviours.

In comparing patients’ perspectives on the definitions of HRQOL, no differences were noted between younger and older patients. Both groups of patients identified happiness, relationships and ability to do activities as defining quality of life. In both younger and older patients, ability to perform activities was fundamental to defining quality of life.

Why older patients with heart failure have better health-related quality of life than younger patients: changed expectations

Data from the interview question exploring individuals’ perceptions of their own HRQOL were used to illuminate reasons for the better HRQOL in elders. Patients’ comments revealed an overarching theme that could be described as ‘Changed Expectations’.

Although younger and older patients both acknowledged the negative impact of their impaired functional abilities on HRQOL, older patients reported that their HRQOL exceeded personal expectations given their age or the alternative of death. ‘It could be worse ... lot’s worse ...’ and similar sentiments were voiced by several older patients. As one 82-year-old male patient stated, ‘I can’t do lots anymore, but I was slowin’ down anyway ... I’m old! What do you expect when ... when you’re old ... everyone is slowin’ down ... I’m still kickin’ though’. Thus, for older patients, ‘Accepting and Grateful’ described their perceptions reflecting the change in expectations for the quality of their lives with HF. Referring to HRQOL, another older patient stated, ‘Even though I can’t do anything that I can do before, I think it’s good.’ As stated by other older patients, ‘I should’ve been dead so many times ... and I am not ... Thank God that I’m alive’ and ‘[T]here’s people in a lot worse shape than I’m in ...’.

Older patients also accepted performance of alternative activities as contributing to a good HRQOL and compared their HRQOL to others they perceived were in worse condition: ‘... because no matter what kind of condition that you get in, as long as you are able to get up and walk around, you can go to hospital, or some place and find people in worse condition ... that’s a good quality of life’.

For younger patients, ‘Loss and Disappointment’ described their perceptions reflecting the change in expectations for the quality of their lives with HF. Younger patients

Table 3. Participant characteristics ($n = 20$)

Characteristic	Means \pm SD or n (%)
Age, years	62 \pm 11 (range 30–88)
Education, years	15 \pm 3
Female	6 (30)
Married	12 (60)
New York Heart Association functional classification III/IV	14 (70)
Caucasian	18 (90)

expected to remain active and maintain their many social, domestic and work roles, but these expectations were changed negatively by the reality of HF. They bemoaned the loss of these roles and their ability to perform activities, and reported their HRQOL as very poor. As shared by a 52-year-old woman, ‘My career is over. I can’t do stuff with my family ... my husband and I had plans ... my quality of life ... is terrible’. A 48-year-old man stated, ‘Poor [HRQOL] ... I’ve gone from being a very active person to being a person that I can do only as much as my body allows me ... now I’m just a couch potato’. A 46-year-old man said, ‘I’m just a shell of my former self ... I can’t do what I want, I can’t live like I want, I’m not, not, myself ... and no good to anyone.’

Discussion

We determined how HRQOL differed among age groups in patients with HF and what factors were associated with this difference. Older patients with HF had better HRQOL and fewer symptoms of anxiety and depression compared with younger patients. Qualitative analysis of data suggested that better quality of life in older compared with younger patients was a result of older patients’ abilities to reconceptualise or change their expectations for quality of life in the context of HF. This finding is supported by other investigators who have found that older adults who ‘give up’ activities due to chronic illness have better mental well-being if they ‘replace’ those activities with other activities that are achievable given the limitations imposed by illness [10].

Psychological distress (e.g. depressive symptoms and anxiety), commonly reported by patients with HF [25, 26], contributes to impairment of HRQOL [27]. In this study, higher levels of psychological distress were observed in younger patients with HF than older patients, which is consistent with previous studies [9]. This appears to translate into worse HRQOL in younger patients compared with their older counterparts.

Narrative descriptions from HF patients in this study provided additional insights about the major factor that explained the mechanism of better HRQOL in older patients with HF. Compared with their younger counterparts, older individuals had a change in their expectations about what constituted a good HRQOL as they aged. Older individuals expected their quality of life to decline as they aged and thus

did not seem devastated, as did younger individuals, when it declined as a consequence of HF. Older patients were able to put their declining functional status into perspective by comparing themselves to others who they considered to be in worse shape. They were grateful that they were still alive and not as bad off as many others. Younger individuals, on the other hand, expected to have long, productive and active lives and had difficulty accepting the many losses attendant with HF.

According to Ubel *et al.* [28] evaluating ones' physical health is a relative process that consists of comparing one's physical health with that of others in the same age group. As people age, the decline in physical capabilities is expected to be a universal phenomenon [28]. This notion may make it easy for older patients to accept physical decrements [29]. Reduced physical capacity due to HF is viewed far more negatively by younger patients as their peers tend to be healthy and very active. Additionally, societal expectations are different between younger and older adults. Younger adults are expected to build their careers and raise families. For younger patients with HF, inability to fulfill their responsibilities results in a discrepancy between what they want to accomplish and what they believe is expected, and what they are actually able to do. This discrepancy may be associated with the feeling of loss and disappointment that result in poor HRQOL.

Of interest, we found that older patients' self-evaluation of their HRQOL was at times contrary to their own definitions of HRQOL. For example, having the ability to perform physical and social activities was an important component of patients' definitions of HRQOL regardless of age, and almost all patients reported that they experienced limitations in physical and social activities since developing HF. Nonetheless, compared with younger patients, most older patients reported that their HRQOL was good. This contradiction reflected the important role of positive outlook and changing personal expectation on older patients' self-evaluations of their HRQOL. Patients often evaluated their HRQOL positively based on how bad things could be instead of how things actually were due to HF, and what they were able to do as opposed to what they were unable to do due to HF.

Although there are no studies examining reasons for the differences in HRQOL between older and younger patients with HF, a recent study of age-related differences in vigilance about symptoms among patients with HF [30] supports the findings from the current study. In that study, younger HF patients perceived that HF symptoms negatively affected their daily lives, which caused hypervigilance. Although this may contribute to the difficulty older patients seems to have monitoring and noting escalating symptoms, it also seems to contribute to older patients' better assessment of their HRQOL.

Marital status was unrelated to HRQOL in the youngest and oldest age groups, but was associated with it in the age groups 54–62 and 63–70 years. We found that being married was associated with worse HRQOL in these two groups. Being married is associated with better outcomes in patients

with HF in some studies [31], while it is unrelated in others [32]. Conflicting findings are likely the result of using marital status as a surrogate for social support. In future studies, social support should be measured to more accurately assess these relationships.

Limitations of this study include the observational, cross-sectional study nature of the study. Given this design, no causal inferences can be made.

Conclusions

In summary, findings from this study indicated that changed expectations may explain why elders had better HRQOL than younger patients. Interventions to improve HRQOL could employ methods that alter patients' cognitive appraisal of their HRQOL. By assisting patients to adopt new goals and see possibilities despite their limitations, their HRQOL could improve.

Key points

- Elders with HF have better HRQOL than do younger patients despite worse morbidity and mortality.
 - Better HRQOL among older HF patients is the result, in part, of better psychosocial status.
 - The major factor driving better HRQOL among older patients is a change in expectations about what constitutes good HRQOL.
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Conflicts of interest

None declared.

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