

ORIGINAL PAPER  
ΕΡΕΥΝΗΤΙΚΗ ΕΡΓΑΣΙΑ

## Quality of life of hospitalized patients with heart failure, NYHA IV

**OBJECTIVE** To explore the quality of life (QoL) of patients hospitalized with heart failure (HF). **METHOD** Data were collected from 60 hospitalized patients with HF NYHA IV by personal interview. The tools were a questionnaire specially designed for the purposes of the study, which included demographic and clinical characteristics and treatment adherence, as well as the Minnesota Living with Heart Failure Questionnaire (MLHFQ) to explore their quality of life (QoL). **RESULTS** Of the 60 patients with HF, 66.7% were males and 76.7% were aged over 70 years. Regarding QoL, 50% of the patients scored above 66 (median) on the total QoL score, and above 30 and 13 in the domains of physical and mental state, respectively. These values indicate a moderate to high effect of HF on the QoL of the patients. Patients with dyspnea or edema recorded 15.1 and 8.5 points, respectively, higher scores on the MLHFQ scale than those without these symptoms ( $p=0.001$ , 95% CI: [8.24, 22.00] and  $p=0.022$ , 95% CI: [1.27, 15.74], respectively). Patients who reported difficulties in everyday activities recorded a mean score higher by 20.37 points on the MLHFQ scale than those who did not ( $p=0.001$ , 95% CI: [8.85, 31.89]). **CONCLUSIONS** Better understanding of the factors affecting the QoL of patients with HF will contribute significantly to the implementation of holistic care for this sensitive group.

Heart failure (HF) is a clinical syndrome with a heavy burden on patients, including personal, family, social and economic consequences.<sup>1</sup> Improved survival after ischemic heart disease, in conjunction with more effective HF treatment, have led to an increase in the prevalence of the disease.<sup>2,3</sup>

HF constitutes a major public health problem, with a prevalence of over 5.8 million in the USA and over 23 million worldwide.<sup>4</sup> The incidence of HF is age-related, with an average age at first diagnosis of 76 years.<sup>5</sup> Survival estimates are 50% and 10% at 5 and 10 years from diagnosis, respectively.<sup>3,4</sup>

This clinical syndrome has a poor prognosis with a high frequency of hospitalizations.<sup>3,4</sup> Patients with HF comprise a vulnerable population, experiencing frequent readmissions due to exacerbation of symptoms, and non-adherence to medical treatment.<sup>6</sup> Rates of hospitalization appear to vary

globally as a result of several interacting factors, including treatment possibilities, discharge diagnosis, disease severity, and concomitant hypertension, atrial fibrillation (AF), diabetes mellitus (DM), and other medical conditions.<sup>7</sup>

In recent years, it has been gradually acknowledged that evaluation of patient's quality of life (QoL) is a key principle in the planning of treatment of this clinical syndrome, providing an important source of medical information in addition to clinical assessment and laboratory and diagnostic tests.<sup>8</sup> Exploring the QoL may lead to improvement of the clinical outcome by identifying treatment goals which are consistent with the perceptions of the patients. Patients can also be helped to develop realistic expectations about the disease and adopt responsibility for their treatment.<sup>8</sup>

The aim of the study was to explore the QoL of patients hospitalized with heart failure, NYHA IV.

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NYHA IV

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### Key words

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## MATERIAL AND METHOD

### Study population

The study group was a convenience sample of 60 patients (40 men and 20 women) suffering from HF who were admitted to a public hospital in Athens during the period January 2017 to March 2017. Data collection was performed by personal interview using the Minnesota Living with Heart Failure Questionnaire (MLHFQ) and a questionnaire developed specially for the purposes of the study, which included demographic and clinical characteristics and self-reported details regarding adherence to treatment and perceptions about their health status.

The criteria for inclusion of a patient in the study were: (a) Good comprehension of the Greek language, (b) diagnosis of HF NYHA IV, and (c) being in the second day of hospitalization, as the MLHFQ measures how patients felt in the preceding four weeks.

### Measuring the QoL of patients with heart failure

The MLHFQ was designed to evaluate the health related QoL (HRQOL) in hospitalized patients with HF. It is the most widely used disease-specific instrument and has been translated into at least 34 languages, with proven reliability and validity. This scale, proposed in 1986 by the University of Minnesota, consists of 21 questions asking how much the disease and its treatment had affected the patient's life in the last month (4 weeks). Respondents answer each question on a Likert type scale (scores from 0: no effect, to 5: very much). The MLHFQ, measures the total score of HRQOL and two separate dimensions of HRQOL: (a) The physical state of the patient, and (b) the mental state of the patient. Specifically, three scores are calculated: (a) The physical state of the patients (range: 0–40), (b) the mental state of patients (range: 0–25), and (c) the total score of QoL derived from all 21 questions (range: 0–105).<sup>9</sup>

### Statistical analysis

Categorical data are presented in absolute and relative (%) frequencies, and continuous data are presented as median values (interquartile range). The Kruskal-Wallis test was used to test the possible association between the QoL and a factor with more than two categories. The Mann-Whitney test was used for the association between the QoL and a factor with two categories. Multiple linear regression was performed to estimate the effect of patient characteristics on QoL. Results are presented as regression coefficients *b* (*b*-coefficients) and 95% confidence interval (95% CI). The level of statistical significance was set at  $\alpha=5\%$ . Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS), version 20 (SPSS Inc, Chicago, IL, USA).

### Limitations of the study

Certain limitations must be considered when interpreting the results of this study. First, causation cannot be inferred since the

findings merely support the association between QoL, adherence to treatment and the demographic, clinical and other self-reported variables. In addition, the use of a convenience sample from a single hospital limits the possibility to generalize to all patients with HF. The small sample size (60 patients) is also a limitation.

### Ethical considerations

The study was approved by the Ethical Committee of the hospital where it was conducted. Patients who met the entry criteria in the study were informed by the researchers of the purposes of this study and participated only after they had given their written consent. Data collection guaranteed anonymity and confidentiality. All subjects were informed of their rights to refuse or discontinue participation in the study, according to the ethical standards of the Declaration of Helsinki (1989) of the World Medical Association.

## RESULTS

### Study population

In total, 60 patients met the inclusion criteria, of which 66.7% were men and 76.7% were aged over 70 years. Only 36.7% considered themselves to be very well informed about their health problem. The majority of patients had insomnia (66.7%), experienced dyspnea during sleep (65%), edema (swelling) (70%), faced difficulties in everyday activities (80%) and thought they were taking a lot of medicines (70%) (tab. 1).

Regarding adherence to therapeutic guidelines after diagnosis, 28.3% did not consume any salt, 15% and 25% continued smoking or drinking alcohol, respectively, 60% exercised fluid restriction, 48.3% kept to their ideal weight, 23.3% kept a weight calendar, 63.3% had the flu vaccine and the 68.3% visited a physician regularly (tab. 2).

Table 3 presents the results of the MLHFQ. At least 50% of the patients' scores were above 66 (median) for the total score of QoL and above 30 and 13 for the physical and mental states, respectively. Regarding the total score, 25% of the participants had a score higher than 78. With regard to the physical and mental state, 25% of the patients had scores higher than 36 and 18, respectively. These values indicate moderate to high effects of HF on the QoL recorded by the patients.

### Association between QoL and specific factors

Table 4 presents the association between various health-related factors and the reported QoL of the patients (total QoL and physical and mental state).

**Table 1.** Demographic characteristics and state of health of patients hospitalized with heart failure (n=60).

Demographic characteristics	n (%)
Sex	
Male	40 (66.7)
Female	20 (33.3)
Age (years)	
30–40	3 (5.0)
41–50	2 (3.3)
51–60	3 (5.0)
61–70	6 (10.0)
>70	46 (76.7)
Informed about the state of health	
Very well	22 (36.7)
Enough	20 (33.3)
A little	13 (21.7)
Not at all	5 (8.3)
Do you have insomnia? (Yes)	40 (66.7)
Do you have dyspnea at night? (Yes)	39 (65.0)
Do you have swelling? (Yes)	42 (70.0)
Do you have difficulties in everyday activities? (Yes)	48 (80.0)
Do you believe you take a lot of medicines? (Yes)	42 (70.0)

**Table 2.** Reported adherence to therapeutic guidelines of patients hospitalized for heart failure (HF) (n=60).

Adherence	n (%)
After diagnosis of HF, how much is your consumption of salt?	
High	1 (1.7)
Moderate	22 (36.7)
Low	20 (33.3)
Not at all	17 (28.3)
After diagnosis, do you smoke? (Yes)	9 (15.0)
After diagnosis, do you drink alcohol? (Yes)	15 (25.0)
After diagnosis, do you have fluid restriction? (Yes)	36 (60.0)
After diagnosis, have you kept the ideal weight? (Yes)	29 (48.3)
After diagnosis, do you keep a weight calendar? (Yes)	14 (23.3)
Did you have the flu vaccine? (Yes)	38 (63.3)
Do you have a regular physician? (Yes)	41 (68.3)

The total MLHFQ score was statistically significantly associated with dyspnea at night ( $p=0.001$ ), edema (swelling) ( $p=0.001$ ), difficulties in everyday activities ( $p=0.001$ ), belief that they were taking a lot of medicines ( $p=0.046$ ) and failure to maintain the ideal weight after diagnosis ( $p=0.023$ ), being higher in all these cases. The physical state score was statisti-

**Table 3.** Measurement of health related quality of life of patients hospitalized with heart failure, according to the MLHFQ (n=60).

Quality of life	Median (IQR)
Total MLHFQ score (range 0–105)	66 (56.5–78)
Physical state (range 0–40)	33 (27–36)
Mental state (range 0–25)	13 (7.5–18)

\*MLHFQ: Minnesota Living with Heart Failure Questionnaire  
IQR: Interquartile range

cally significantly associated with the female sex ( $p=0.042$ ), insomnia ( $p=0.007$ ), having dyspnea at night ( $p=0.001$ ), edema (swelling) ( $p=0.001$ ), difficulties in everyday activities ( $p=0.001$ ) and failure to maintain the ideal weight after diagnosis ( $p=0.012$ ), being higher in all these cases.

The mental state score was statistically significantly associated with the degree of information that patients had about their state of health ( $p=0.029$ ), dyspnea at night ( $p=0.015$ ), edema (swelling) ( $p=0.002$ ), everyday difficulties ( $p=0.001$ ), belief that they were taking a lot of medicines ( $p=0.040$ ) and drinking alcohol after diagnosis ( $p=0.046$ ), with higher scores in all these categories.

### Impact of the factors affecting the QoL of patients with heart failure

Table 5 presents the results from multiple linear regression analysis of the effect of the various factors found to be associated with the QoL of the patients with HF, according to their MLHFQ scores.

This analysis showed that patients who experienced dyspnea at night or edema recorded 15.12 and 8.5 points, respectively, higher score on the MLHFQ scale than those who did not ( $p=0.001$ , 95% CI: [8.24, 22.00] and  $p=0.022$ , 95% CI: [1.27, 15.74], respectively). Patients who reported difficulties in everyday activities scored 20.37 points higher on the MLHFQ than those who did not ( $p=0.001$ , 95% CI: [8.85, 31.89]).

Regarding the physical state, patients who experienced dyspnea at night or reported difficulties in everyday activities had 7.78 and 9.9 points, respectively, higher scores on the physical state domain of the scale than those who did not ( $p=0.001$ , 95% CI: [4.44, 11.12] and  $p=0.002$ , 95% CI: [3.94, 15.87], respectively).

## DISCUSSION

Patients with HF experience a variety of problems attributable to physical and cognitive impairment that affect

**Table 4.** Factors associated with the quality of life of patients with heart failure, according to the MLHFQ (n=60).

	Total MLHFQ score		Physical state		Mental state	
	Median (IQR)	p-value	Median (IQR)	p-value	Median (IQR)	p-value
<i>Sex</i>						
Male	65 (78–82.5)	0.142	31 (35–39)	0.042	13 (17.5–22)	0.252
Female	68 (78–86)		34.5 (37.5–39.5)		14 (19–22)	
<i>Age (years)</i>						
≤70	64.5 (77–81)	0.546	34 (36–39)	0.944	9 (14–20)	0.073
>70	66 (78–84)		32.5 (35–39)		14 (18–22)	
<i>Informed about the state of health</i>						
Very well	63 (74–78)	0.149	32.5 (35–39)	0.579	10 (15–18)	0.029
Enough	68 (80–83)		32 (37–38.5)		14 (19.5–22.5)	
A little/not at all	67.5 (79–91)		33.5 (36–39)		14.5 (20–24)	
<i>Insomnia</i>						
No	62 (74–85.5)	0.06	27 (34.5–38.5)	0.007	12.5 (15.5–21.5)	0.122
Yes	68 (78–83.5)		33.5 (36.5–39)		14 (18.5–22)	
<i>Night dyspnea?</i>						
No	46 (66–70)	0.001	19 (32–34)	0.001	11 (13–20)	0.015
Yes	72 (79–88)		35 (37–39)		14 (19–23)	
<i>Swelling?</i>						
No	48 (59–70)	0.001	21.5 (30–33)	0.001	8.5 (13–22)	0.002
Yes	71 (79–84)		35 (37–39)		14.5 (19–22)	
<i>Difficulties in everyday activities?</i>						
No	29.5 (50–78)	0.001	13 (22.5–32)	0.001	5 (9.5–17)	0.001
Yes	68.5 (78.5–84)		34.5 (37–39)		14 (18.5–22)	
<i>Do you believe you take a lot of meds?</i>						
No	62 (43–68)	0.046	30 (18–37)	0.539	11 (5–13)	0.040
Yes	69.5 (59–78)		33 (28–36)		14 (9–19)	
<i>After diagnosis, do you drink alcohol?</i>						
No	66 (56–77)	0.447	33 (28–35)	0.871	13 (5–16)	0.046
Yes	70 (59–79)		30 (27–38)		17 (9–21)	
<i>After diagnosis, have you kept the ideal weight?</i>						
No	70 (63–79)	0.023	35 (31–37)	0.012	14 (10–18)	0.127
Yes	63 (46–70)		29 (19–35)		12 (5–15)	

MLHFQ: Minnesota Living with Heart Failure Questionnaire; IQR: Interquartile range

their QoL adversely. Patients with severe HF, especially those with a lower income, with a long history of the disease or prolonged hospital stay, and those with high levels of anxiety and depression, are reported to experience diminished QoL.<sup>9–13</sup> Regarding the population suffering from HF in Greece, poor quality of life is reported to be experienced by men, the elderly, the unmarried, those with basic education and those suffering from the disease for less than 10 years.<sup>12,13</sup> In addition, poorer QoL is documented in patients with HF than in those with stable coronary artery disease.<sup>10</sup>

Poor QoL was shown in this study to be associated with low adherence to treatment. Participants who, after diagnosis of HF, did not keep their ideal weight and those who reported drinking alcohol had poorer QoL. Many factors may be responsible for failure in adherence to treatment. First, the number of nurses involved in educating these patients is insufficient to meet the needs for comprehensive advanced information about the disease. Second, because of the age at diagnosis, many patients may have cognitive impairment, which makes it difficult for them to

**Table 5.** Impact of factors associated with quality of life of patients with heart failure, according to the MLHFQ (n=60) (multiple linear regression).

	Total MLHFQ βcoef (95% CI)	Physical state βcoef (95% CI)	Mental state βcoef (95% CI)
<i>Sex (male vs female)</i>	–	-2.48 (-5.93, 0.97)	–
<i>Informed about the state of health</i>			
Very well	–	–	Ref. cat.
Enough	–	–	2.78 (-0.64, 6.2)
A little/not at all	–	–	1.9 (-2.19, 6)
<i>Insomnia (yes vs no)</i>	–	2.74 (-0.85, 6.33)	–
<i>Dyspnea at night (yes vs no)</i>	15.12 (8.24, 22)*	7.78 (4.44, 11.12)*	0.63 (-2.61, 3.88)
<i>Swelling (yes vs no)</i>	8.5 (1.27, 15.74)*	3.58 (-0.05, 7.22)	1.45 (-2.3, 5.21)
<i>Difficulties in everyday activities (yes vs no)</i>	20.37 (8.85, 31.89)*	9.9 (3.94, 15.87)*	2.36 (-3.15, 7.88)
<i>Do you believe you take a lot of meds? (yes vs no)</i>	2.96 (-3, 8.91)	–	2.57 (-0.37, 5.51)
<i>After diagnosis, do you drink alcohol? (yes vs no)</i>	–	–	2.32 (-1.36, 6)
<i>After diagnosis, have you kept the ideal weight? (yes vs no)</i>	-3.17 (-10.06, 3.72)	-1.81 (-5.19, 1.57)	–

MLHFQ: Minnesota Living with Heart Failure Questionnaire; 95% CI: Coefficient interval

\* Statistically significant coefficient

learn new skills. Third, patients with HF may be suffering from depression that undermines their motivation and ability to adopt new behavior. Fourth, their knowledge and understanding about the disease may be insufficient to allow patients to negotiate the significant challenges of modifying their behavior.<sup>14–17</sup>

Undoubtedly, the central role in adherence to HF treatment is the way in which patients perceive the disease. In particular, patients with a strong belief in the necessity for treatment are more likely to show better treatment adherence. Interventions to improve patients adherence to HF treatment are related to the issues of improving their knowledge and understanding, increasing incentives and providing practical help. Adherence to treatment fluctuates, varying with time, and thus needing constant evaluation.<sup>14–17</sup>

The results also showed that patients who believed that they were taking a lot of medicines reported worse total QoL. It is not rare for those patients who are prescribed a large number of medications to stop taking them. One explanation for discontinuing medication is the cessation of symptoms, which gives patients the wrong impression that the drug is no longer necessary. An alternative explanation is that patients may experience a loss of confidence in medication due to the exacerbation of their symptoms over time. Reminding patients to take their medicines, and explaining the reasons for this, especially if they consider them unnecessary, is an effective long-term intervention.<sup>14–17</sup>

Drinking alcohol after their diagnosis of HF was associated with worse scores on the mental state domain. This

finding merits further investigation, as in the present study, it was not explored whether patients used to drink before the onset of the disease or if their state of health led them to adopt unhealthy behavior such as alcohol consumption. Heavy drinking has been shown to increase the risk of HF whereas light-to-moderate drinking (up to one drink per day for women and up to two drinks per day for men) has been associated with a lower risk of HF.<sup>18,19</sup>

To the best of our knowledge, data about the effects of alcohol consumption on QoL of patients with HF are scarce. The reported alcohol consumption in the study sample illustrates failure of adherence to treatment advice, and should be taken into serious consideration by health professionals when implementing strategies to reduce unplanned hospitalizations.

The reduced level of QoL in patients with HF found in this study was similar to the results of a prior study conducted in Greece,<sup>12</sup> which showed that at least 50% of participants scored below 54 (median) in the overall score expressing QoL in HF patients and below 22 and 11 for the physical and mental state, respectively.

In conclusion, a high total score on the MLHFQ, that is, poorer overall QoL, was associated with dyspnea at night, edema, difficulties in everyday activities, the belief that they were taking a lot of medicines and failure to maintain their ideal weight after the initial diagnosis.

The physical state score was associated with the female sex, insomnia, dyspnea at night, edema, difficulties in everyday activities and failure to maintain the ideal weight. All of

these factors were being related to poorer physical health.

A poorer mental state score was associated with the degree of information that patients had about their state

of health, dyspnea at night, edema, difficulties in everyday activities, belief that they were taking a lot of medicines and drinking alcohol after the diagnosis of HF.

## ΠΕΡΙΛΗΨΗ

### Ποιότητα ζωής νοσηλευομένων ασθενών με καρδιακή ανεπάρκεια, NYHA IV

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**ΣΚΟΠΟΣ** Η διερεύνηση της ποιότητας ζωής νοσηλευομένων ασθενών με καρδιακή ανεπάρκεια NYHA IV. **ΥΛΙΚΟ-ΜΕΘΟΔΟΣ** Το δείγμα της μελέτης περιελάμβανε 60 ασθενείς. Η συλλογή των δεδομένων πραγματοποιήθηκε με τη μέθοδο της συνέντευξης, χρησιμοποιώντας ένα ειδικά σχεδιασμένο ερωτηματολόγιο για τους σκοπούς της μελέτης το οποίο περιελάμβανε δημογραφικά, κλινικά και άλλα χαρακτηριστικά που σχετίζονταν με τη συμμόρφωση στη θεραπεία καθώς και την κλίμακα "Minnesota Living With Heart Failure" (MLHFQ) για τη διερεύνηση της ποιότητας ζωής. **ΑΠΟΤΕΛΕΣΜΑΤΑ** Στο σύνολο των 60 ασθενών, οι άνδρες αποτελούσαν το 66,7% ενώ το 76,7% του δείγματος ήταν ηλικίας >70 ετών. Σχετικά με την ποιότητα ζωής, διαπιστώθηκε ότι το 50% των ασθενών είχαν βαθμολογία περισσότερο από 66 (διάμεσος) στη συνολική βαθμολογία της ποιότητας ζωής και περισσότερο από 30 και 13 στη σωματική και στην ψυχική κατάσταση, αντίστοιχα. Οι εν λόγω τιμές έδειξαν μέτρια έως υψηλή επίδραση της καρδιακής ανεπάρκειας στην ποιότητα ζωής των ασθενών. Επί πλέον, βρέθηκε ότι οι ασθενείς που εμφάνισαν δύσπνοια ή οίδημα είχαν 15,12 και 8,5 βαθμούς, αντίστοιχα, υψηλότερη βαθμολογία στην κλίμακα MLHFQ συγκριτικά με εκείνους οι οποίοι δεν είχαν ( $p=0,001$ , 95% CI: [8,24, 22,00] και  $p=0,022$ , 95% CI: [1,27, 15,74], αντίστοιχα). Παρόμοια, οι ασθενείς οι οποίοι αντιμετώπιζαν δυσκολίες στις καθημερινές δραστηριότητες είχαν 20,37 βαθμούς υψηλότερη βαθμολογία στην κλίμακα MLHFQ συγκριτικά με εκείνους που δεν είχαν ( $p=0,001$ , 95% CI: [8,85, 31,89]). **ΣΥΜΠΕΡΑΣΜΑΤΑ** Η πλήρης κατανόηση των παραγόντων που επηρεάζουν την ποιότητα ζωής ασθενών με καρδιακή ανεπάρκεια θα συμβάλει σημαντικά στην παροχή ολιστικής φροντίδας.

**Λέξεις ευρητηρίου:** Καρδιακή ανεπάρκεια, Νοσηλευόμενοι ασθενείς, NYHA IV, Ποιότητα ζωής

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