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# Quality of Life and Related Factors in Patients with Chronic Heart Failure

**Mina Moradi [1], Neda Mehrdad[*] [2], Soghra Nikpour [3], Hamid Haghani [4]**

*[1]MSc, PhD in nursing, Department of Nursing, School of Nursing and Midwifery, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran .Center for Nursing Care Research, School of Nursing &Midwifery, Iran University of Medical Sciences,Tehran, Iran.*

*[2]MSc, PhD. Professor of Nursing, Endocrinology and Metabolism Research Center, Clinical Sciences Institute, Endocrinology and Metabolism Research Institute, Tehran University of Medical Sciences.School of Nursing &Midwifery, Tehran University of Medical Sciences.* ***(Corresponding Author)***

*[3]BSc, MSC in Nursing. Assistant professor, Center for Nursing Care Research, School of Nursing &Midwifery, Iran University of Medical Sciences,Tehran, Iran.*

*[4] MSc, PhD in Mathematical Statistics. Faculty Member School of Public Health, Iran University of Medical Sciences, Tehran, Iran.*

## Abstract

**Background and Aim:** Health-related quality of life (HRQOL) is an important clinical outcome in patients with chronic Heart failure (CHF). The aim of this study was to evaluate HRQOL in patients with CHF and determine its relationship with demographic and clinical variables.

**Materials and Methods:** In this cross-sectional descriptivecorrelational study, 200 patients with CHF were selected from clients referring to teaching hospitals affiliated to Tehran University of Medical Sciences. They were interviewed to complete demographic and clinical questionnaires and the Kansas City Cardiomyopathy Questionnaire (KCCQ). Some clinical variables were extracted from their medical records. KCCQ was used to measure their HRQOL. Descriptive statistics, independent t-test and ANOVA were used for data analysis.

**Results: S**elf–efficacy domain had the highest score (mean=61, SD=18.31) and physical symptoms had the lowest (mean=42.92, SD=13.45) in HRQOL. There was a significant relationship between HRQOL and 4 demographic variables: sex, educational level, economic condition, as well as occupational status and also between HRQOL and clinical variables including: duration of illness, number of hospitalizations, non-cardiac diseases, ejection fraction, diuretic consumption and body mass index there was a statistically significant relationship.

**Conclusion:** Patients with CHF had low HRQOL. Nurses and healthcare providers should plan care and programs to reduce frequency, severity and symptoms of heart failure and help improve HRQOL in these patients**.**

**Keywords:** Chronic diseases, Health-related quality of life (HRQOL), Heart failure.

**Corresponding author**:Neda Mehrdad,ORCID ID: 0000-0002-8385-2801.Email:nmehrdad@tums.ac.ir**Received**: August 2023, **Accepted**: September 2023, **ePublish**: Summer 2023. **Citation:**Moradi M,Mehrdad N, Nikpour S, Haghani H,Quality of Life and Related Factors in Patients with Chronic Heart Failure,Knowledge of Nursing Journal. 2023;1(2):177-187.



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## Introduction

Since 1900, except for 1918, heart diseases have been the most important cause of death in the United States every year [1]. Cardiac diseases are one of the most common conditions in the world and according to theAHA (2020), it is estimated that, currently, 26 million people live with chronic heart failure (CHF) in the US [2]. The incidence of this condition has increased in recent years. It is estimated that its prevalence will be more than8 million cases by the year 2030 [3]. CHF is the end stage of some conditions such as ischemic heart disease and hypertension [4]. It is the main cause of hospitalization in patients over 65 with more than 50% of readmission [5]. Patients with CHF face many different symptoms in breathing, sleep, cognition, or may experience anxiety, feeling of powerlessness or depression with compromised quality of life [4]. Accordingly, quality of life is considered a factor in predicting the consequences of CHF [6].

Quality of life (QOL) and health-related quality of life (HRQOL) are in the core scope of nursing. In studies related to heart failure, the distinction between QOL and HRQOL has been less discussed. In HRQOL, smaller goals with more limited scope are considered [7]. Many factors affecting HRQOL, such as individual, cultural, and disease-related factors cannot be controlled by healthcare team while some are modifiable with nursing interventions. Nurses can improve HRQOL in patients with CHF by providing appropriate care [8].

Some studies have found poorer QOL at CHF in comparison with chronic obstructive pulmonary diseases, arthritis, unstable angina, and myocardial infarction [9]. In addition, HRQOL in patients with CHF is poorer than normal population with the same age and sex [10]. The aim of this study was to evaluate HRQOL in patients with CHF and to determine its relationship with demographic as well as clinical variables.

## Methods

In this descriptive cross-sectional study, patients were recruited from two teaching hospitals affiliated to Tehran University of Medical Sciences (TUMS).After setting the values in the formula: n $=\frac{(Z1-\frac{a}{2}+Z1-\beta)2}{\mathrm{d}\omega^2}+3\omega=\frac{1}{2}ln^2\frac{1+r}{1-r}$, sample size was estimated 200. Stratified sampling method was used to have a proportional number of clients at each hospital and was continued according to the



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contribution of each hospital. At the end, 130 clients were selected from Hazrat Rasool Akram hospital and 70 from Firozgar hospital, both of which are hospitals in Tehran, the capital of Iran.Sampling was done in 2011.

The researchers referred to the cardiac clinics and wards of the hospitals all days of the week in the morning and evening shifts and, after explaining the aims of the study, gave the questionnaires to the patients who were eligible and willing to participate. Sampling lasted for 4 months. Inclusion criteria were diagnosis of CHF, ejection fraction less than 40, related signs and symptoms for 6 months or longer, being 18 years or older and willingness to take part in the study. The objectives of the research were described to the subjects and written consent was obtained from them. Clients with mental disorders, history of heart surgery at least 3 months ago, movement disorders causing disability to stand for measuring height and weight, and illiteracy with hearing disorders were excluded from the study.

Demographic data including age, gender, marital status, educational level, and employment status were collected by interview. Medical records were used to collect clinical data including duration of the disease, number of hospitalizations, type of referral, history of noncardiac diseases, ejection fraction, diuretic consumption, BMI, and mean blood pressure. The Kansas City cardiomyopathy questionnaire (KCCQ) [11] was used to measure HRQOL. This 23-item self-report questionnaire has been designed to assess several CHF-specific domains: physical limitations (6 items), symptom frequency (4 items), severity (3 items), self-efficacy (2 items), social interference (4 items) and QOL (3 items). Each domain was transformed to a 0-100 scale with higher scores indicating better health status. The KCCQ is self-reported, and its average completion time is 4–6 minutes, for the ease of work, these questions were asked from patients.

Content method was used to ensure the validity of the questionnaires. Accordingly, 8 experts provided their comments and corrections to be applied in the tools. For reliability, 20 clients other than the main subjects with similar specifications completed the questionnaires and Cronbach's alpha was measured ($\alpha$ = 97%). Chen et al. (2009) calculated Cronbach's alpha of KCCQ as 91% [12].In addition to English, KCCQ has been validated at many peer-reviewed



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publication in Japanese, Korean, and Hindi languages [13].

Proposal of the study was approved by the Research Council of Tehran University of Medical Sciences.For ethical considerations, necessary approvals and permissions were obtained from Research Center of the School of Nursing and Midwifery (No. 505, M.P.), Research Ethics Committee of the school, relevant authorities, and health centers. The researchers introduced themselves to the subjects and explained research objectives to obtain their consent for participation in the study. They were assured of anonymity and confidentiality and their freedom to quit participation at any time. The questionnaires were given to clients in outpatient clinics or during their admission in the wards.

To measure the body mass index, the last measurement of weight and height (not more than 1 month) in the medical records was used. If these 2 variables were not available, they were measured with a specific scale (after calibration) and tape meter with hospital clothes and without shoes. Diuretics consumption and ejection fraction were also extracted from the patients' records. The average blood pressure of the patients was also measured from their left arm in a sitting position after ten minutes of initial rest to ensure that the patient was calm, with the same calibrated sphygmomanometer with the following formula:

$$\text{Average BP} = \frac{\text{systolic blood pressure} + \text{diastolic blood pressure} \times 2}{3}$$

Descriptive statistics including frequency, mean, standard deviations (SD), range and percentage was used. Besides that, One-way ANOVA, independent t-tests and Chi-square were used for data analysis. Level of significance was considered 0.05 in the analysis.

## Results

A total of 200 clients (128 males, 72 females) participated in the study. Demographics showed that mean age of the patients was 73.17 years (SD=10.35), 84% was married. 50.5% had elementary education, and 46.5% was retired. Mean BMI was 24.9 $kg/m^2$ (SD = 4.6 $kg/m^2$). Mean duration of illness from the time of diagnosis was 37.8 months (SD = 26.88). 84% was hospitalized and the rest was treated as outpatient.

Some subjects suffered from other chronic diseases such as diabetes (15%), hypertension (25%), hyperlipidemia (12%), asthma (7.5%), hypertension with diabetes (26.5%), and osteoarthritis (3%). 7.5% had



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other diseases and some had no other diseases (3.5%). Among the clients, 83.5% took diuretics. Ejection fraction and mean blood pressure of clients were 34.7% (SD = 7.2) and 96.7 mmHg (SD = 1.05) respectively.

**Health-related quality of life**

Self–efficacy domain had the highest score (mean = 61, SD = 18.31) and symptom stability was the lowest (mean = 42.92, SD = 13.45). There were significant relationships between 4 demographic variables (sex, educational level, economic condition, as well as occupational status) and some HRQOL domains (physical limitation P<0.01, social limitation P<0.02), (physical limitation P<0.02, social limitation P<0.00, self-efficacy P<0.03), (symptom stability P<0.02), (QOL P<0.04) respectively.

Significant relationships were also found between most clinical variables (length of illness, number of hospitalizations, other chronic conditions, EF, diuretic consumption, as well as BMI) and HRQOL domains (symptom stability P<0.03, social limitation P<0.07), (self-efficacy P<0.00, social limitation P<0.00), (self-efficacy P<0.01), (physical limitation P<0.001, symptoms of the disease P<0.005, social performance P<0.006, QOL P<0.015, overall HRQOL P<0.000), (physical limitation P<0.009, symptoms of the disease P<0.000, social performance P<0.011, QOL P<0.005, overall QOL P<0.002), and (physical limitation (P<0.042), efficacy (P<0.013), overall HRQOL P<0.06).

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**Table 1: Relationship between HRQOL and BMI, EF, diuretic consumption, and mean BP**

| Variables | | HRQOL Domains | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | **Physical limitation** | **Symptomsof the disease** | **Symptom Stability** | **Self-Efficacy** | **Social Performance** | **QOL** | **Overall HRQOL** |
| BMI | <20 kg/m2 | 43.78±15.91 | 38.57±15.66 | 60.00±17.45 | 50.56±21.29 | 54.31±14.16 | 38.25±17.75 | 44.66±11.97 |
| | 20-24.99 kg/m2 | 53.04±12.95 | 44.01±12.43 | 56.80±16.14 | 60.90±18.07 | 60.85±14.62 | 45.83±11.64 | 51.54±10.32 |
| | 25-29.99 kg/m2 | 53.39±14.82 | 42.43±13.94 | 57.77±14.36 | 62.03±18.00 | 59.16±15.98 | 45.37±13.11 | 50.90±11.49 |
| | 30 and more kg/m2 | 52.11±15.52 | 43.61±13.95 | 56.66±16.67 | 67.08±14.48 | 59.16±14.68 | 48.88±13.26 | 51.63±11.84 |
| | Kruskalwallis test result And ANOVA | F=2.794 P=0.042* | F=1.023 P=0.38 | F=0.270 P=0.84 | F=3.68 P=0.013* | F=1.14 P=0.33 | 2=5.80χ P=0.12 | F=2.43 P=0.06* |
| EF | 10-19 | 42.5±10.80 | 35.71±11.52 | 54.00±13.02 | 58.12±16.36 | 52.25±9.38 | 39.58±12.35 | 43.45±7.45 |
| | 20-29 | 48.09±14.30 | 39.67±13.45 | 53.71±18.64 | 57.85±16.35 | 55.14±17.04 | 41.90±12.70 | 46.98±11.06 |
| | 30-40 | 54.22±14.19 | 13.30±44.70 | 58.75±14.94 | 62.15±18.97 | 61.44±14.63 | 46.95±13.20 | 52.50±11.07 |
| | Kruskalwallis test result And ANOVA | F=7.88 P=0.001* r=0.272 p=0.00* | F=5.3 P=0.005* r=0.227 p=0.001* | χ 2=3.16 P=0.2 | F=1.05 P=0.35 | F=5.26 P=0.006* r=0.222 p=0.002* | F=4.27 P=0.015* r=0.201 p=0.004* | F=8.62 P=0.000* r=0.282 p=0.000* |
| Diuretic consumption | Has it | 50.79±14.13 | 41.52±13.57 | 57. 60±15.64 | 60.70±18.57 | 58.23±14.98 | 44.41±13.76 | 49.53±11.09 |
| | Does not have | 57.97±14.45 | 50.04±10.40 | 56.36±16.92 | 62.50±17.11 | 65.45±13.65 | 50.00±9.08 | 56.19±10.04 |
| | T-TEST | t=-2.657 p=0.009* df=198 | t=-4.070 P=0.000* df=55.92 | t=0.411 P=0.6 df=198 | t=-0.514 P=0.6 df=198 | t=-2.566 P=0.011* df=198 | t=-2.932 p=0.005* df=65.06 | t=-3.202 P=0.002* df=198 |
| Mean blood pressure | 70 -89 (mmHg) | 53.29±13.04 | 41.86±13.23 | 58.84±13.38 | 59.85±17.20 | 62.40±13.37 | 46.63±11.69 | 51.31±9.61 |
| | 90-109 (mmHg) | 52.32±14.47 | 43.80±13.29 | 56.27±16.72 | 62.20±18.84 | 58.44±15.87 | 45.34±13.69 | 50.86±11.73 |
| | mmH=<110 (g) | 46.14±16.71 | 39.84±15.16 | 61.05±15.59 | 55.92±17.36 | 57.89±12.16 | 41.66±14.16 | 47.17±11.23 |
| | Kruskalwallis test result And ANOVA | F=1.82 P=0.16 | F=0.93 P=0.3 | χ2=1.7 P=0.4 | F=1.11 P=0.33 | F=1.40 P=0.2 | F=0.97 P=0.37 | F=1.03 P=0.35 |

***There is a statistical correlation (P value<0.05)**

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## Discussion

Most clients experienced lowered HRQOL. Findings showed that self–efficacy domain had the highest score, which is similar to Chen et al's. study [12]. There was a significant relationship between physical limitations as well as social functioning domains and sex. In addition, the scores of these domains were higher in women than men. Abbasi et al. found a significant relationship between QOL and gender with higher scores in men [14]. This difference may be due to ejection fraction and the degree of their heart failure.

Physical limitation, social limitation, and self-efficacy domains had a significant relationship with educational level. In fact, higher education led to better QOL. Clients with lower educational level had poorer QOL in some domains [15]. It may be due to better understanding of the condition and receiving more detailed information, leading to better adaptation to their chronic disease. On the other hand, patients with lower educational level are usually anxious, worried, isolated, and depressed, which can play a significant role in lowering their QOL.

Findings also showed a significant relationship between symptom stability and economic status; therefore, patients with better economic condition had higher HRQOL. Heo et al also reported a significant relationship between economic status and HRQOL in patients with CHF [16].Probably, these people have better control over their disease symptoms by referring to health centers and consulting with care team. There was a significant relationship between HRQOL and occupational status too ($p = 0.045$). It may be due to better spirit and income in employed people than unemployed ones.

BMI had a significant relationship with physical limitation and self-efficacy domains. Thus, it seems that the more normal BMI is, the better HRQOL would be. A significant difference in HRQOL was found between clients with BMI less than 20 or more than 30 because of weight loss over exacerbation of the symptoms [17]. In study of Reddy et al., patients with higher BMI correspondingly had poorer QOL [18] LaMonte et al. argued that patients with CHF and higher BMI had less physical activity and depended on others for daily activities, which led to lower HRQOL [19].

The relationship between different domains of HRQOL and the duration of the disease was also investigated, which showed a significant relationship of this variable in terms of durability and stability of the disease as well as social functioning. Therefore,



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patients with shorter duration of illness had better HRQOL. These findings were similar to those of Abbasi et al. [20]. There was also a significant relationship between self-efficacy as well as social functioning domains and number of hospitalizations. Polikandrioti et al. also found a relationship between increased number of hospitalizations and reduced HRQOL [21]. It may result from gradual inability of clients to control their symptoms, leading to lowered HRQOL.

Results of this research also showed a significant relationship between other chronic diseases and self-efficacy domain ($P<0.016$). Jarab et al.found that other chronic diseases in patients with CHF can affect QOL [22]. This relationship also existed between HRQOL and ejection fraction. Most patients with 30-40% ejection fraction had better QOL compared to other groups. These results were consistent with Shojae [15]. Abbasi et al. reported that increased severity of heart disease and reduced ejection fraction significantly declined QOL [14]. QOL in a number of patients with CHF was low, and the more severe CHF was, the lower QOL would be [22]. By reducing cardiac ejection fraction, physical activities of these patients become limited and more clinical symptoms appear, which can affect their social functioning and QOL.

Findings showed a significant relationship between the consumption of diuretics and physical limitations, disease symptoms, social functioning and QOL domains. Accordingly, patients with diuretics consumption had lowered QOL. The use of diuretics which is suitable for reducing blood pressure in patients with CHF has several side effects, including electrolyte imbalance, symptomatic hypotension, as well as increased blood uric acid, and its long-term use reduces blood sodium levels. As a result, symptoms such as anxiety, weakness, fatigue, malaise, muscle cramps, frequent urination and sleep disorders may occur [23]. HRQOL in patients with CHF decreased. No significant relationship between mean blood pressure and HRQOL domains can be justified with this fact that this variable was in the normal range.

## Conclusion

Reduced HRQOL in patients with CHF suggests the necessity for more attention to all life domains. The results can be helpful for patients, cardiovascular nurses and physicians to pay attention more



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specificallyto the paradox of obesity in these patients and reducing frequency as well as severity of all symptoms of CHFto improve HRQOL. Since the study was conducted in 2 teaching hospitals in Tehran, it definitely cannot reflect the situation of the country. It is recommended to carry out further studies to find correlation between laboratory findings such as brain peptides and HRQOL in these patients.

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**Conflict of Interest**

The authors declared no conflict of interest in conducting and publishing the research**.**

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