

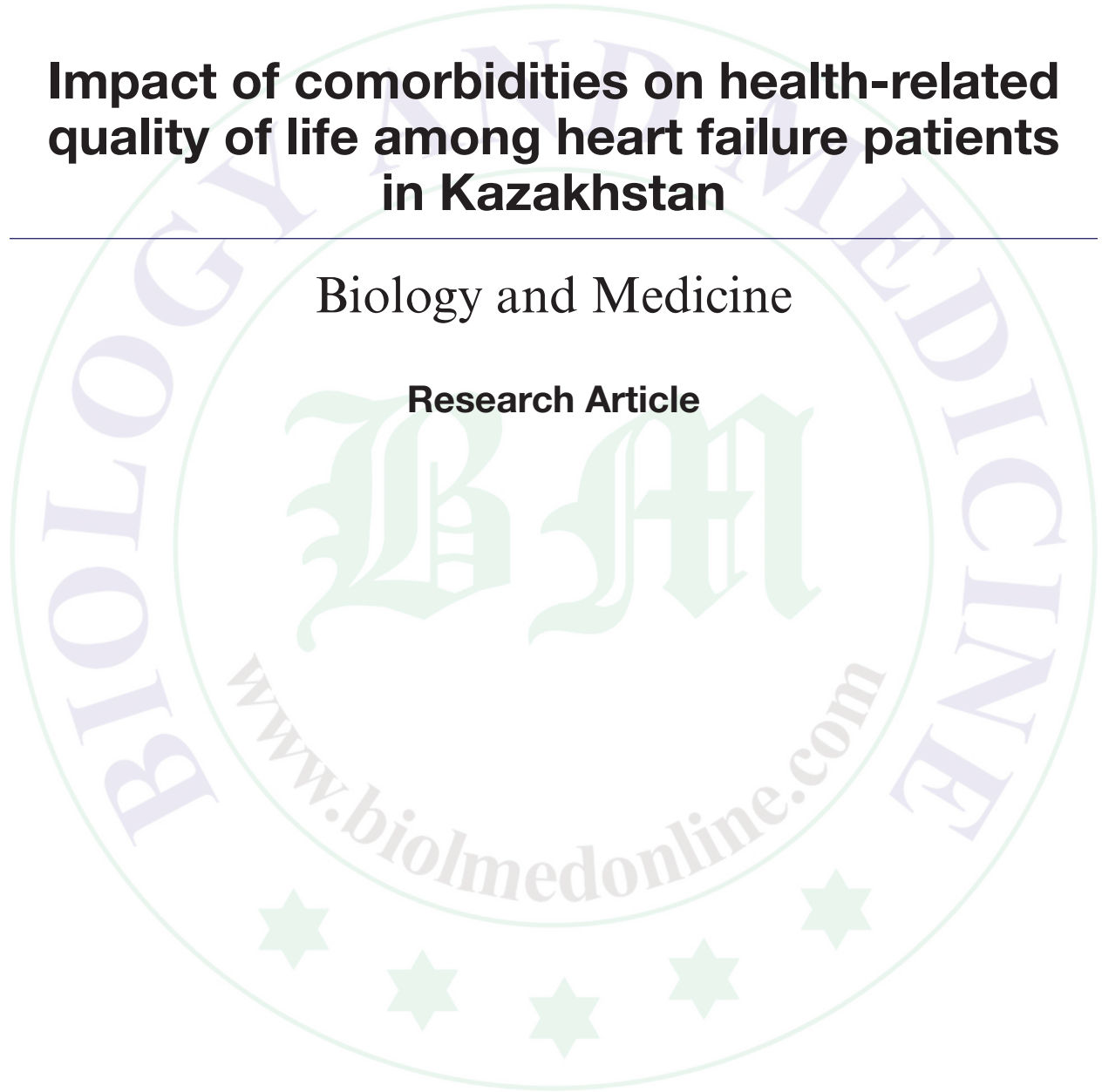
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# **Impact of comorbidities on health-related quality of life among heart failure patients in Kazakhstan**

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## Impact of comorbidities on health-related quality of life among heart failure patients in Kazakhstan

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### Abstract

The purpose of this study was to assess the impact of comorbidities on health-related quality of life (HRQL) in patients hospitalized with acute myocardial infarction in Cardiology Department of Emergency Hospital of Semey, Kazakhstan after a 12-month follow-up period. HRQL was assessed using the Minnesota living with heart failure questionnaire (MLHFQ). 93.7% of study patients had concomitant illness. Comparing the MLHFQ scores, no statistically significant differences were observed between the patients with and without comorbidities. The MLHFQ ( $n = 285$ ) showed a moderate impairment of HRQL in the population studied.

**Keywords:** Heart failure; health-related quality of life; comorbidity.

### Introduction

Heart failure (HF) is often accompanied by comorbid conditions, contributing to increased morbidity and mortality, and impairment of quality of life. Recent evidence suggests that noncardiovascular deaths are increasing among patients with HF [1]. According to estimates earlier this decade, globally 7.1 million deaths were found to be attributable to nonoptimal blood pressure. This represents two-thirds of all strokes, one-half of all ischemic heart diseases, and three-quarters of all hypertensive diseases [2]. Although comorbidities might cause HF, it is reasonable to believe that HF itself might be a cause of multiple other comorbidities [3]. The prevalence of comorbidities is higher in patients with more severe signs of heart failure [4]. HF has been shown to reduce health-related quality of life (HRQL) to a greater extent than most other chronic diseases [5]. In patients with HF poor HRQL is associated with higher frequencies of hospital readmission [6,7] and death [8]. Currently, mortality from cardiovascular disease (CVD) ranks first among the total mortality in Kazakhstan [9].

This study aimed to assess the impact of comorbidities on HRQL in patients admitted during 2012 with a primary or secondary diagnosis of acute myocardial infarction (AMI) in Cardiology

Department of Emergency Hospital of Semey, Kazakhstan after a 12-month follow-up period.

### Materials and Methods

HRQL was assessed using the Minnesota living with heart failure questionnaire (MLHFQ), which is the most widely known and used in studies of the HRQL of patients with HF, and has been shown to have good reliability and validity in numerous studies [10-14]. The MLHFQ is a 21-item, disease-specific measure of HRQL that was developed specifically for use in patients with HF. We evaluate how HF affects patients' physical, emotional, and social environment dimensions. Table 1 shows the number of items in each dimension.

Five hundred sixty-three patients with AMI who were admitted to Cardiology Department of Emergency Hospital in the Semey region of Kazakhstan during 2012 were eligible to participate in the study. Of the 563 patients hospitalized with AMI, 503 were discharged and 60 died during their hospital stay. The list of the eligible participants was derived from the hospital discharge reports which contained also information on patients' gender, age, social status, and medical history. In order to avoid duplicate records, readmissions to the hospital during the study

**Table 1: Interpreting the MLHFQ.**

MLHFQ		Meaning of scores	
Dimension	Number of items	“Worse” score	“Better” score
Physical	8 (1-6,12,13)	40	0
Emotional	5 (17-21)	25	0
Social environment	4 (8-10,15)	20	0
Others	4 (7,11,14,16)	20	0
Total	21	105	0

**Table 2: Overview of patient participation in the study.**

Classification	Numbers	%
Followed-up	285	56.6
Terminally ill and not able to communicate	11	2.2
Died during the follow-up period	15	3
Refused to participate	38	7.6
Did not complete the interview	14	2.8
Impossible to contact, maybe there was a change of address	65	12.9
Was not recorded of a telephone number and repeated hospitalizations	75	14.9
Total	503	100

period were not counted as new cases. An overview of patient participation in the study is presented in Table 2.

Participation was voluntary and verbal consent was obtained before the start of the telephone interview. Two hundred eighty-five patients agreed to be interviewed. Interviews were conducted in February 2014 by third-year Ph.D. doctoral student with prior clinical research experience using interviews. We used the Russian translation [15] of the MLHFQ to assess the HRQL in Kazakh HF patients. Generally, majority of patients know Russian language in Kazakhstan. If necessary, interviewer explained the meaning and translated into Kazakh language the questions.

### Data Analysis

Categorical variables were presented as counts and percentages, and quantitative variables as means and standard deviation (SD). The normality of the distribution of quantitative variables was assessed by the Kolmogorov–Smirnov test.

The dependent variable was HRQL, and independent variables were demographic factors. Differences between independent groups were calculated using the Student's *t*-test for normally distributed variables. *P*-values < 0.05 were considered to be statistically significant.

### Results and Discussion

Two hundred eighty-five patients with HF were included in the current study. Socio-demographic data included participants' age, gender, and social status. Mean age of the patients was 60.8, ranging from 34 to 84. The baseline patient characteristics are summarized in Table 3.

Comorbidities were recorded based on the patients' hospital discharge reports. The following comorbidities were considered: hypertension, diabetes, chronic obstructive pulmonary disease (COPD), chronic kidney failure. Of all patients, 67% ( $n = 191$ ) had at least one comorbidity, 26.7% ( $n = 76$ ) had two or more comorbidities, and only 6.3% ( $n = 18$ ) had no comorbidity.

**Table 3: Baseline patient characteristics (n = 285).**

Characteristics	Value
<b>Gender</b>	
Male	204 (71.6)
Female	81 (28.4)
<b>Age</b>	60.8 ± 10.0
<35	1 (0.4)
35-45	16 (5.6)
46-55	79 (27.7)
56-65	95 (33.3)
>65	94 (33.0)
<b>Social status</b>	
Retired	124 (43.5)
Disabled	38 (13.3)
Unemployed and disabled	5 (1.8)
Working	62 (21.8)
Retired and disabled	3 (1.0)
Unemployed	52 (18.2)
Working and disabled	1 (0.4)
<b>Comorbidities</b>	
Hypertension	265 (93.0)
Diabetes	41 (14.4)
COPD	35 (12.3)
Chronic kidney failure	7 (2.5)
Two or more comorbidities	76 (26.7)
<b>MLHFQ score</b>	
Physical	14.9 ± 6.9
Emotional	4.8 ± 3.4
Social environment	9.8 ± 3.7
Total	34.7 ± 13.8

Abbreviations: COPD, Chronic Obstructive Pulmonary Disease; MLHFQ, Minnesota Living with Heart Failure Questionnaire.

Note: Data are presented as the mean ± standard deviation or number (%).

The prevalence of hypertension was 93%, and the prevalence rate of diabetes, COPD and chronic kidney failure were 14.4%, 12.3%, and 2.5%, respectively. Table 4 compares MLHFQ scores between HF patients with and without comorbidities, and with <2 versus ≥2 comorbidities.

Patients with hypertension, COPD, chronic kidney failure, and ≥2 comorbidities had higher scores in all dimensions of the MLHFQ, indicating poorer HRQL compared with those with <2 comorbidities. In our study, diabetes was not associated with worse HRQL, which is similar to the findings of [13] and [10]. Our findings

indicate that among HF patients in Semey region of Kazakhstan hypertension (93.0%), diabetes (41%), and COPD (35%) were the comorbidities with the highest prevalence, while [16] reported that chronic kidney disease (41%), anemia (29%), and diabetes (29%) were the most prevalent comorbidities among HF patients in Europe. A recent Italian study [12] showed that hypertension was present in more than 60% of the HF patients, and diabetes in 33%, and “Heart Failure Alone” was present in only 10% of the patients, while in our study also only 6.3% of HF patients had no comorbidity. A study performed in Russia reported that hypertension was



Table 4: Comorbidities associated with HRQL.

MLHFQ dimensions	Hypertension		t (independent)	P-value
	Yes	No		
Physical	15.06 ± 6.9	13.05 ± 6.6	1.247	0.213
Emotional	4.9 ± 3.4	3.55 ± 2.7	1.686	0.093
Social environment	9.94 ± 3.7	8.25 ± 3.3	1.944	0.053
Total	35.06 ± 13.9	29.9 ± 11.9	1.615	0.107
	Diabetes			
	Yes	No		
Physical	14.46 ± 6.5	15.0 ± 7.0	-0.455	0.649
Emotional	4.66 ± 3.5	4.83 ± 3.4	-0.290	0.772
Social environment	9.61 ± 3.6	9.86 ± 3.7	-0.388	0.699
Total	33.71 ± 13.5	34.86 ± 13.8	-0.496	0.621
	COPD			
	Yes	No		
Physical	15.66 ± 5.9	14.82 ± 7.1	0.665	0.507
Emotional	4.89 ± 3.5	4.79 ± 3.4	0.150	0.881
Social environment	9.91 ± 4.0	9.81 ± 3.7	0.156	0.876
Total	35.14 ± 12.1	34.64 ± 14.0	0.203	0.839
	Chronic kidney failure			
	Yes	No		
Physical	19.43 ± 6.9	14.81 ± 6.9	1.737	0.083
Emotional	6.71 ± 2.6	4.76 ± 3.4	1.483	0.139
Social environment	10.43 ± 3.2	9.81 ± 3.7	0.432	0.666
Total	43.14 ± 10.2	34.49 ± 13.8	1.642	0.102
	<2 Comorbidities	≥2 Comorbidities		
Physical	14.83 ± 7.1	15.18 ± 6.4	0.381	0.703
Emotional	4.76 ± 3.4	4.93 ± 3.6	0.384	0.701
Social environment	9.76 ± 3.7	10.0 ± 3.8	0.483	0.629
Total	34.55 ± 14.0	35.12 ± 13.1	0.309	0.758

Abbreviations: COPD, Chronic Obstructive Pulmonary Disease; MLHFQ, Minnesota Living with Heart Failure Questionnaire.

associated with significantly impaired physical HRQL depending on the severity of the disease in patients with HF, and less noticeable impaired HRQL in emotional and social environment dimensions in the MLHFQ [17], while our study indicates that in HF patients with hypertension HRQL was equally impaired in physical, emotional, and social environment dimensions. Our study has found that HF patients' self-reported HRQL as measured by the MLHFQ, impaired in a moderate degree, and the differences in HRQL between patients with and without comorbidities, and with <2 versus ≥2 comorbidities were not statistically significant. Further studies with a prospective design and a larger sample size are required.

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