Assessment of quality of life in patients with congestive heart failure and its correlation with the International Classification of Functioning, Disability, and Health

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ABSTRACT

Objective: To evaluate the quality of life of patients with heart failure and correlate it with the International Classification of Functioning, Disability, and Health (ICF). **Method:** This is a cross-sectional study with a sample of 19 patients, mean age of 66.28 ± 10.93 years, whose quality of life was assessed by the Minnesota Living with Heart Failure Questionnaire (MLHFQ); for each question a domain of ICF was given whose results were then correlated. **Results:** The average MLHFQ questionnaire score was 61.21 ± 17.56. There was a positive correlation between the quality of life and left ventricular ejection fraction ($r = 0.75$; $p = 0.0006$), which was not seen when comparing the quality of life with functional class. There was a high correlation between patient outcomes and the assessment of the physiotherapist using the ICF. **Conclusions:** The MLFHQ questionnaire includes the requirements of the ICF, showing a high correlation between its responses and those from the ICF, and is considered global, which allows these instruments to be used in evaluating patients with congestive heart failure (CHF).

Keywords: International Classification of Functioning, Disability and Health, Heart Failure, Quality of Life

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INTRODUCTION

Congestive heart failure (CHF) has a bad prognosis, which brings a significant, gradual, and functional decline and which carries a high cost for treatment. This decline has a direct impact on the patients' quality of life and rehabilitation. The low quality of life is related to a high rate of hospitalizations and mortality.[1] One of the resources to soften this impact on quality of life is the practice of physical exercises, which improve aerobic capacity and resistance to fatigue and consequently have a positive impact on their lives.[2,3]

Among the instruments for evaluating the quality of life of patients with CHF is the Minnesota Living with Heart Failure Questionnaire (MLHFQ).[4] Aside from that, there is a continuing search for better evaluation, tracking, and treatment of CHF and a uniform global language could contribute to a better exchange of ideas among health professionals. One of the instruments to standardize the language regarding functioning is the International Classification of Functioning, Disability, and Health (ICF). Developed by the World Health Organization (WHO), it is a tool suitable for identifying the conditions of functioning, the environment, any personal characteristics that interfere in the quality of life, and to aid in communication and the exchange of information, in addition to allowing an approach from different patient rehabilitation perspectives.[5]

The ICF has been used on cardiopathy patients to classify and evaluate those patients in the various phases of cardiac rehabilitation — as much in a hospital[6,7] as in a clinic[8] — and it has developed a core set specific to patients with chronic, ischemic illnesses;[9] however, there are no reports in the literature for CHF.

OBJECTIVE

The primary objective of this work was to describe and quantify the quality of life of subjects with CHF-in addition to establishing a relationship between the MLHFQ quality of life questionnaire and the ICF-and, secondarily, to try to relate quality of life with functional class and ejection fraction.

METHOD

This was a cross-sectional study with 19 individuals diagnosed with CHF selected at the clinic and hospital services of the cardiology department of the *Hospital Ministro Costa Cavalcanti*, in Foz do Iguaçu, Paraná. This research was approved by the Committee on Ethics in Research of the *Universidade Estadual do Oeste do Paraná* (ruling No. 842.232/2014) and follows the ethics principles of the Declaration of Helsinki.

Included were individuals between the ages of 45 and 85, of both genders, with a clinical diagnosis of CHF, and who showed no signs of neurological or cognitive dysfunction that would limit their filling out the questionnaire. Excluded were individuals with hemodynamic instability who were admitted to the coronary unit. All participants read and signed the terms of free and informed consent.

Evaluation instruments

The Minnesota Living with Heart Failure Questionnaire (MLHFQ): this is composed of 21 questions on physical and emotional difficulties and items related to financial considerations and quality of life, with possible scores for each question ranging from 0 to 5 points-0 for no limitations and 5 for maximum limitation. The total score can range from 0 to 105 points, with the lowest score representing a better quality of life: the cut point is at 26 points, below which is classified as good, 26 to 45 as moderate, and over 45 is classified as poor.[10] The questions refer to activities in the most recent month to establish the score.[4]

The International Classification of Functioning, Disability, and Health (ICF): in order to establish the relationship between the MLHFQ and the ICF, two researchers selected ICF categories that could be related to the quality of life questionnaire (Chart 1).

To guarantee the reliability of the relationship established between the MLHFQ and the ICF, a series of eight norms were used as proposed by Cieza et al.[11]: 1) Before establishing any relationship with the ICF, there must be a working knowledge of the fundaments and concepts of the ICF-their chapters and categories, as well as their respective definitions;) Each activity must be connected to the most precise ICF domain; 3) Do not use the qualifiers "not specified," identified by the number 8 at the end. If the content of a concept is not explicitly named in the corresponding ICF domain, supplementary information must be given in the reporting process; 4) Do not use the qualifiers "not applicable" identified by the number 9; use a qualifier of lower level; 5) If the information supplied by the activity is not sufficient to select an ICF domain, it must be listed as "not definable;" 6) If the activity is not contained in the ICF, but it is perceptible that the concept falls within a personal factor defined in the ICF, it must be listed as "personal factor;" 7) If the activity is not contained in the ICF and is not considered a personal factor, it must be listed as "not covered in the ICF;" 8) If the concept of the activity refers to a diagnosis or a specific health condition, it must be listed as "health condition."

What each item of the instrument covered along with the definition of each ICF domain was considered afterwards. Once the relationship was established, the researchers met to discuss and come to an agreement on the inclusion or exclusion of the categories. To give significance to the ICF categories, generic qualifiers were given that indicated the gravity of the problem or barrier.

The qualifiers varied from 0 to 4, where 0 signified "no barrier/no facilitator," and 4 represented "complete barrier/complete facilitator." There are still the qualifiers 8 and 9, which mean "not specified" and "not applicable," respectively. In presenting the results, the qualifiers from 1 to 4 were grouped as "some impairment" for the functioning components and bodily structures and activity and participation, and as "barrier" for environmental factors; while the qualifiers 0 and 9 were grouped as "no impairment" for functions and bodily structures and activity and participation, and as "no barrier" for environmental factors.[12,13]

A physiotherapeutic evaluation was done and the MLHFQ quality of life questionnaire was applied. Next, a second researcher evaluated the same patients using the ICF proposal developed in this study. Obviously this second evaluation was carried out without any knowledge of the results from the MLHFQ questionnaire.

The data was presented as a frequency distribution with mean and standard deviation, and with a confidence interval of 95%. The Spearman correlation coefficient was used for comparisons between functional class, according to the New York Heart Association (NYHA),[14] the ejection fraction, and the final MLHFQ score, as well as the comparison between each question from the MLHFQ and the ICF. The significance level stipulated was 5% and the statistical program used was InStat Graph Pad 3.4.

RESULTS

The sample was composed of 19 individuals whose clinical and epidemiological characteristics are shown in Table 1.

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The results of the evaluation using the selected ICF categories are shown in Table 2.

No significant correlation was observed analyzing functional class and quality of life (r = 0.31; *p* = 0.19). However, upon analyzing the ejection fraction of the left ventricle and the quality of life, a positive correlation was confirmed (r = 0.75; *p* = 0.0006) (Figure 1).

Table 3 shows a high correlation between patients' answers to the MLHFQ and the evaluation using the ICF.

DISCUSSION

The decision was made to focus this study on the search for tools necessary to do an overall evaluation of patients with CHF whose functional limitations reduced their quality of life. In addition to being a source of information for a multidisciplinary team, this was based on the need to identify the disease's influence on the patients' lives.[15]

The average age in this study was 66.28 years and the prevalence of functional classes II and III from the NYHA was similar to the results obtained by Lage.[16] It is known that age is related to the presence of cardiac diseases and risk factors, since those aged between 65 and 74 present a greater prevalence of arterial hypertension (HTN).[17] The present sample, in addition to fitting into the mentioned age bracket, also presents different risk factors such as HTN and *diabetes mellitus* (DM).

The study by Nogueira et al.[18] investigated the epidemiological profile of CHF and presented characteristics similar to that of the present study as regards average age of the participants and the most frequent risk factor. HTN must be taken into consideration, for elevated arterial pressure is related to the increased decompensation seen with CHF.[19]

The MLHFQ was used due to its being specific for CHF.[20,21] The average score in the present study was considered to be high (61.21), which corresponds to a low quality of life. In the study by Nogueira et al.[22] the authors observed an average score of 41.86. The higher scores found here could be related to the fact that the majority of the patients evaluated were hospitalized for cardiac decompensation and for their prevalence in functional classes III and IV. Di Naso et al.[23] also found high scores in the quality of life evaluations, mainly from patients suffering in the less functional classes.

It is believed that different factors can have an impact on the quality of life

Chart 1. Proposed classification of the MLHFQ using the ICF

| MLHFQ	ICF
Causing swelling in your ankles and legs?	s75021 swelling/edema in ankles and legs
Making you sit or lie down to rest during the day?	d4100 lying down
Making your walking about or climbing stairs difficult?	d4501 walk long distances
Making your working around the house or yard difficult?	d640 doing housework
Making your going places away from home difficult?	d460 get around to different places
Making your sleeping well at night difficult?	b1343 quality of sleep
Making your relating to or doing things with your friends or family difficult?	d760 family relationships
TMaking your working to earn a living difficult?	d8502 work full time
Making your recreational pastimes, sports or hobbies difficult?	d9201 practice sports
Making your sexual activities difficult?	d7702 intimate relationships
Making you eat less of the foods you like?	d550 eating
Making you short of breath?	b460 dyspnea
Making you tired, fatigued, or low on energy?	b4552 fatigue
Making you stay in a hospital?	e5800 hospitalization
Costing you money for medical care?	d860 basic economic transactions
Giving you side effects from treatments?	e1101 medicine causing side effects
FMaking you feel you are a burden to your family and friends?	e310 burden on family
Making you worry	b1266 self-confidence
?	b1649 worry
Making it difficult for you to concentrate or remember things?	b1400 lack of concentration
Making you feel depressed?	b1521 depression

Table 1. Characterization of studied sample

Variable		95% CI
Gender	6 F/13 M	
Age	66.28 ± 10.93	(61.29; 71.13)
Weight	75.43 ± 14.01	(69.13; 81.73)
Height	1.68 ± 0.09	(1.64; 1.72)
BMI	26.62 ± 4.11	(24.77; 28.47)
MLHFQ	61.21 ± 17.56	(53.31; 69.11)
Ejection Fraction (%)	42 ± 12	(36%; 48%)
Smoking history		
Smoker	3(16%)	
Ex-smoker	12(63%)	
Non-smoker	4(21%)	
Associated illnesses		
Diabetes	9(47%)	
Arterial hypertension	14(74%)	
Dyslipidemia	3(16%)	
Respiratory disease	5(26%)	
Functional class		
NYHA I	0(0%)	
NYHA II	4(21%)	
NYHA III	7(37%)	
NYHA IV	8(42%)	

BMI: Body Mass Index; MLHFQ: Minnesota Living with Heart Failure Questionnaire;; NYHA: New York Heart Association.

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Table 2. Presentation of the ICF with its qualifiers

ICF Domain	ICF Qualifier							
	Some impairment					No impairment		
	1	2	3	4	%	0	9	%
Body Functions								
b1343 Low sleep quality	2	2	5	5	74	5	-	26
b460 dyspnea	1	3	2	13	100	-	-	-
b4552 fatigue	1	1	3	13	95	1	-	5
b1266 self-confidence	2	3	4	8	89	2	-	11
b1649 worry	3	2	3	11	100	-	-	-
b1400 lack of concentration	1	2	4	7	74	5	-	26
b1521 depression	2	2	10	5	100	-	-	-
Body Structures								
s75021 swelling/edema of legs and ankles	2	3	3	6	74	5	-	26
Activities and Participation								
d4100 lying down	2	2	6	8	95	1	-	5
d4501 long walks	1	0	2	15	95	1	-	5
d640 doing housework	3	5	2	8	95	1	-	5
d460 getting around to different places	1	2	3	8	74	5	-	26
d760 family relationships	1	1	4	5	58	8	-	42
d8502 work full time	0	1	4	9	74	5	-	26
d9201 practice sports	3	3	2	8	84	3	-	16
d7702 sexual relationships	1	1	3	12	89	2	-	11
d550 eating	1	3	6	8	95	1	-	5
d860 basic economic transactions	5	5	5	4	100	0	0	-
Environmental Factors	Barrier					No barrier		
e5800 hospitalization	8	5	0	4	89	2	-	11
e1101 medicine causing side effects	3	2	6	4	79	4	-	21
e310 burden on family	3	4	2	7	84	3	-	16
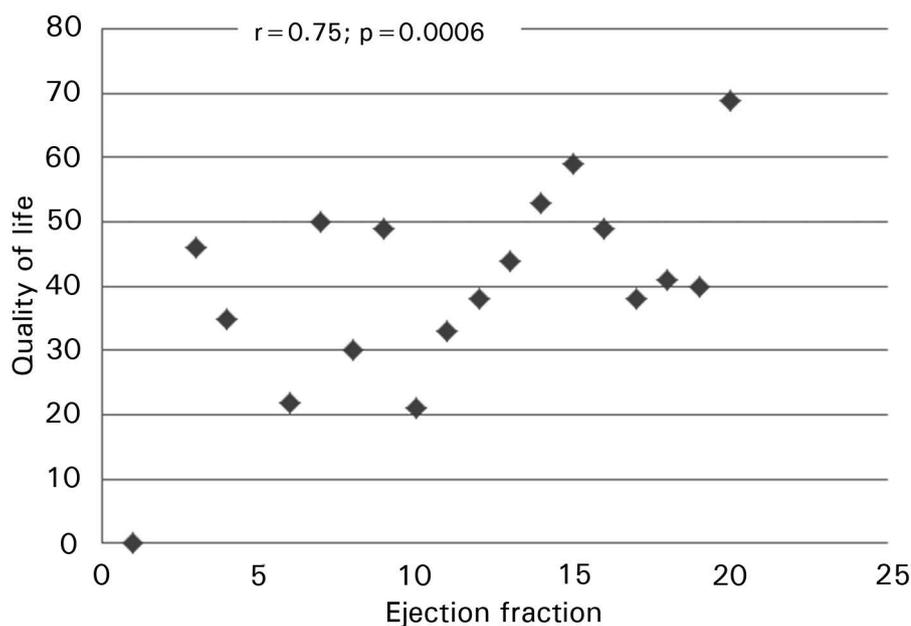
Figure 1. Correlation between the left ventricle ejection fraction and the quality of life

of patients. In spite of Moraes et al.[24] not finding any significant correlations after applying the MLHFQ questionnaire on patients with an ejection fraction < 50%, the present study did observe a correlation (r = 0.75; *p* = 0.0006).

Santos et al.[25] found a low however significant correlation between the quality of life and the ejection fraction, and justified this result by explaining that the low cardiac output does not eliminate the needs of the organism, intensifying the CHF symptoms, and reducing the quality of life.

All the present patients were seen to present a tendency towards depression, as evaluated by question 21 in the MLHFQ questionnaire (Making you feel depressed?). This condition is more common among the sufferers of cardiovascular diseases and is related to clinical[26] deterioration, leading to a low quality of life.[27]

Intending to provide an internationally standardized language to describe the problems and interventions in the health area, the World Health Organization (WHO) created the ICF.[28]

Core sets were created to facilitate the use of the ICF, with a set of categories for specific health conditions developed by a group of specialists.[29,30] Another way to facilitate using the ICF is to establish a relationship with instruments already validated.[31-34] However, no study has yet been published that proposes any core sets for congestive heart failure.

Based on the MLHFQ, there were 21 ICF domains selected, divided among the four ICF domains: 7 for body functions, 1 for body structures, 10 for activities and participation, and 3 for environmental factors-in other words, it was possible to establish a relationship between the MLHFQ and the selected categories.

Due to the small sample of subjects with CHF, it is difficult to generalize for the entire population in question, however it was possible to establish a significant correlation between the MLHFQ and the ICF in this sample. Furthermore, the ICF categories assigned to classify the quality of life of subjects with CHF must be considered as dynamic, obeying one of the characteristics of the ICF-in other words, the proposed classification must not be considered as exclusive, but rather as the basis for new proposals. More studies in this area would ratify the relationship between these two tools in evaluating the quality of life and functioning of CHF patients.

CONCLUSION

The results of this study demonstrate that the studied sample presented a low

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Table 3. Correlation between questions answered by patients and the ICF evaluation

MLHFQ Question	CIF Domain	Correlation (r)	IC	p-value
1	s75021	0.98	[0.9583; 0.9942]	0.0001*
2	d4100	0.96	[0.9207; 0.9884]	0.0001*
3	d4501	0.93	[0.8805; 0.9823]	0.0001*
4	d640	0.99	[0.9729; 0.9961]	0.0001*
5	d460	0.98	[0.9541; 0.9934]	0.0001*
6	b1343	0.98	[0.9588; 0.9941]	0.0001*
7	d760	1.00	[0.9572; 0.9963]	0.0001*
8	d8502	0.95	[0.9606; 0.9944]	0.0001*
9	d9201	0.98	[0.9560; 0.9937]	0.0001*
10	d7702	0.96	[0.9113; 0.9870]	0.0001*
11	d550	0.96	[0.9080; 0.9874]	0.0001*
12	b460	0.93	[0.8460; 0.9768]	0.0001*
13	b4552	0.95	[0.8739; 0.9812]	0.0001*
14	e5800	0.98	[0.9631; 0.9947]	0.0001*
15	d860	0.97	[0.9419; 0.9916]	0.0001*
16	e1101	0.98	[0.9566; 0.9938]	0.0001*
17	e310	0.98	[0.9513; 0.9930]	0.0001*
18	b1266	0.97	[0.9387; 0.9911]	0.0001*
19	b1649	0.96	[0.8959; 0.9847]	0.0001*
20	b1400	0.98	[0.9567; 0.9673]	0.0001*
21	b1521	0.98	[0.8972; 0.9849]	0.0001*

Statistically significant

quality of life correlated with the left ventricular ejection fraction (LVEF). It was found that the MHLFQ questionnaire includes all the requirements of the ICF, containing the main categories of the four domains that are in this classification, which indicates that both tools can be utilized to evaluate these patients.

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