



Psychometric properties of the Quality-of-Life Questionnaires (SF-36), (MLHFQ) Minnesota Living with Heart Failure Questionnaire among Congestive Heart Failure Patients

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ABSTRACT

Introduction: The Minnesota Living with Heart Failure Questionnaire (MLHFQ) is one of the most extensively used heart failure patient quality of life questionnaires (HF). It includes physical and emotional scores, as well as a total score. However, its factor structure has been questioned, and alternatives proposed, including a third factor expressing a social dimension. This Survey used to monitor population health, assess treatment outcomes, and estimate illness burden.

Aims: Validation and testing of the SF-36 Quality of Life Questionnaire (QOLQ) and the Minnesota Living with Heart Failure Questionnaire (MLHFQ) were the main objectives of this work in CHF patients. To identify the psychometric properties of the quality-of-life questionnaires (SF-36) and MLHFQ questionnaire among congestive heart failure patients

Methodology: The quasi experimental study was conducted in those individuals who has suffered with heart failure (n= 36). These patients were admitted at the FIC, Faisalabad. The teach-back technique was introduced to teach about the self-care to improve the QOL of the participants. Every participant was administered the SF-36 and MLHFQ after intervention Post-test -1 was conducted at 30 days after accomplishment of the intervention with filling of both tools collected by the researcher/ facilitator on one-month clinical follow-up visit. Posttest-2 was conducted at 90 days after intervention at each participant on three-month follow-up visit.

Results: The researcher were evaluated the questionnaires psychometric parameters, as well as the extent to which one may rely on the accuracy of a measurement, computation, or specification. (Internal consistency, test-retest analysis, and inter-item correlation). Exploratory factor analysis was used to determine the construct validity.

Conclusion: It is found that the Urdu version of the Questionnaires (SF-36) and the MLHFQ questionnaire were proven to be a trustworthy and valid tool for improving quality of life in patients with congestive heart failure. With the use of these versions of the scale, assessing patient QOL, performance, has become smoother and readmission frequency in congestive heart failure Patients would become lesser.

Key Words: Psychometric Properties, SF-36, MLHFQ, Congestive Heart Failure Patients, QOL, Cronbach's alpha

INTRODUCTION

Acute and chronic heart failure are unquestionably significant clinical and healthcare difficulties. The global population of individuals with some form of heart failure will continue to grow, despite breakthroughs in therapy.² Furthermore, patient expectations are also increasing with regard to advances in all forms of therapy.³ Progress in drug therapy, surgical and catheter-based options, along with mechanical circulation assist devices and transplantation, is now able to offer an improved quality of life for years after an initial diagnosis of heart fail-

ure. However, the paradox is that patients are becoming more complex and frequently a multidisciplinary team approach is necessary for optimal management with multiple objectives, including quality and quantity of life, reduced hospitalizations and healthcare costs, and a recognition of the role of appropriate referral to a hospice and palliative care when further care might be approaching futility.⁴

The aim of this paper is to validate (SF-36) and MLHFQ questionnaire among congestive heart failure patients and gather different perspectives from highly esteemed clinicians and researchers on a variety of topics pertaining to the

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management of patients with congestive heart failure. While rapidly advancing therapies preclude a definitive comprehensive guide, our goal is to present an up-to-date collection of topics that could serve as a useful adjunct to the classical textbooks. Particular emphasis is given to niche topics that are sometimes ignored in other works or are not as “glamorous” or high profile as topics such as transplantation and ventricular assist devices (all of which are worthy of entire texts themselves.⁵

Innumerable specific QOL questionnaires for patients with CHF have come to be observed as important assessment tools in recent years.⁶ Among these, one of the most widely known and used is the (SF-36) and MLHFQ.⁷ It has been translated and culturally modified into at least 34 languages and has been shown to have excellent psychometric characteristics in multiple studies.⁸ However, there are some concerns about its factor structure and the homogeneity of items.²

Objective:

- To identify the psychometric properties of the (SF-36), MLHFQ questionnaire among congestive heart failure patients
- To validate the (SF-36), MLHFQ questionnaire among congestive heart failure patients

Methodology:

This research used a systematic approach in order to assess the psychometric features of (SF-36), MLHFQ questionnaire among congestive heart failure patients of Faisalabad Institute of Cardiology Faisalabad, Punjab Pakistan. The Quasi experiment were conducted among patients with CHF (n=36) were selected from Faisalabad Institute of Cardiology, Faisalabad Pakistan.

Participants:

The research participants were recruited using a convenient sampling technique. The sample included males and females hospitalized to cardiology; the researcher extracted initial information from participant's files for heart failure finding and obtained permission from individuals who met the eligibility requirements. The majority of patients in this sample were classified as having an ejection fraction of less than 40% by the NYHA (New York Heart Association Classification).¹

Geographical Data:

Geographical variables were measured by 10 item structured questionnaire. (Age, Gender, weight (BMI), Height, Education level, Marital status, work, Ejection fraction, Race)

Pilot Study:

After the completion of backward translation procedures, some volunteer participants completed English versions of

the (SF-36), MLHFQ questionnaire. The experts were consulted again to check the item difficulty, its clarity precision and content of the items. The goal of the pilot study was to validate the instrument and to test its reliability. The SPSS Version 25 computer analysis system was used to input the people identified through their names in the database. The results of the pilot survey helped to establish stability and internal consistency reliability, face and content validity of the translated scales.

RESULTS

Table 1: Interpretation of Sample

Geographical Data		N=36 %
Age	41-46 Years	14.0%
	47-51 Years	16.8%
	52-56 Years	22.3%
	57-61 Years	19.5%
	62-66 Years	27.8%
Gender	Male	72.2%
	Female	27.8%
Occupation	Employee	44.4%
	Unemployed	47.2%
	Retired	8.3%
Marital status	Married	91.7%
	Unmarried	8.3%
BMI	18.00-25.00	30.6%
	26.00-30.00	44.5%
	31.00-40.00	25.1%
Total cholesterol(mg/dL)	200	2.8%
	220	5.6%
	230	36.1%
	250	19.4%
	260	2.8%
	270	8.3%
	275	2.8%
	300	22.2%
Ejection fraction	30%	19.4%
	35%	47.2%
	40%	13.9%
Classification NYHA	Class-II	27.8%
	Class-III	72.2%
Qualification	Illiterate	44.4%
	Primary	41.7%
	Middle or above	13.9%
Residency	Rural	50.0%
	Urban	50.0%
Smoking	Yes	22%
	No	14%

The above table shows that (72.2%) male participants and (27.8%) female participants were included. The employee status of the participants depicted that most of the participants were unemployed i-e (47.2%), 44.4% were employee

and 8.3% were retired. The data regarding marital status of the participants showed that (91.7%) were married and (8.3%) were unmarried. The Classification NYHA of the participants (27.8%) were Class-II, and Class 3 were (72.2%).

Table 2: Statistical Interpretation of SF 36 and MLHFQ Questioner

Scale	N	Mean	SD	Minimum	Maximum	Variance
SF 36	36	4.58	4.58	1.43	5.00	14.53
MLHFQ	36	4.51	4.51	1.00	5.00	13.07

Note. SF 36; MLHFQ. The coefficients of internal consistency are shown in parenthesis.

In both the SF 36 (36 items) and the MLHFQ (21 items) scales, statistical Interpretation and test of normal distribution indicated that they followed a normal distribution. The construct validity of the 57-item questionnaire was evaluated in comparison to the SF 36 (36 items) and the MLHFQ (21 items). The variance of the SF 36 (36 questions) was 14.53, while the variance of the MLHFQ (21 items) was 13.07.

Table 3:

Scale	Cronbach's alpha r	Test-retest reliability Coefficients r	Hotelling's T-Squared Test	Tukey's Test for Non additivity F
SF-36	0.558*	0.946*	97.1	35.67
MLHFQ	0.697*	0.974*	86.6	17.37

Note. SF 36 and MLHFQ.

A total of 36 items are included in the SF 36, as well as the MLHFQ are also included (21 items). Cronbach Alpha Coefficients, Test-Retest Reliability Coefficients, and Correlations with the SF 36 and MLHFQ. At the.001 level, all correlations are significant. The SF 36 (36 items) and MLHFQ (21 items) psychometric parameters, as determined by the measure of a test's reliability, (Test-re-test reliability) a measure of accuracy derived by delivering the same test repeatedly to a group of people over a period of time, Hotelling's T-Squared Test, and Tukey's Test for Non additivity, validated the tool's consistence.

Table 4: The SF 36's (36 questions) Cronbach's alpha coefficients and MLHFQ (21 items) questionnaires.

Scale	SF 36	MLHFQ
SF 36	1.000	0.558**
MLHFQ	1.000	0.457**

Note. SF 36 and MLHFQ **.

The Linear regression is statistically considerable at the 0.01 level (2-tailed). Correlation coefficients between two questioners' SF 36 ($r = .558^{**}$) and MLHFQ ($r = .457^{**}$) significant at 0.01. The obtained result indicates that the individual probability of item replies on two questionnaire was constantly similar as probability of the overall number of responses.

Conformity Factor Analysis:

Conformity Factor Analysis (CFA) is a method of determining whether or not a product conforms to a specification. SF-36 (which has 36 items) and MLHFQ (21 items) Questions were asked in order to check the quality of the data, and various analysis were carried out. For factorial validity, among other things, confirmatory factor analysis using structural equation modelling (SEM) methods was undertaken, among other things (Byrne, 2001). Moreover, the maximum likelihood estimate (MLE) approach was carried out with the help of the AMOS 23.0 package.

Table 5: Indexes of model fit CFA for SF 36 (36 items) and MLHFQ (N = 36)

Indexes	Chi square	df	CFI	RMSEA	GFI	RMR
Model	104.562	34	.919	0.00	2.52	.694

As per the three-factor model of SF 36 (36 items) and MLHFQ Questionnaires, This model consistently exhibits the characteristics of a well-fitting model. The Chi square value of 104.56 and the df of 34 are related with a P value less than 0.50. RMSEA has a value of 0.00, which is below the threshold of 0.08, whereas all three of the other parameters have values near to or greater than 0.8.

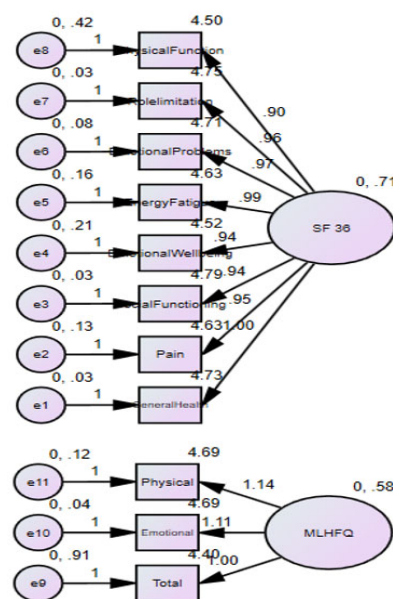


Figure 1: Note. (SF 36) and (MLHFQ) consist of total (57-items).

There was a moderate to high correlation between the SF-36 and the parallel MLHFQ domains, indicating convergent validity. Patients with HF had the lowest MLHFQ scores at baseline ($P=.000$), and MLHFQ scores were lower than SF-36 scores ($P=.000$). Supporting the validity of the criteria. The MLHFQ is well-tolerated by patients undergoing treatment and retains strong psychometric properties when compared to the SF-36.

DISCUSSION

To investigate psychometric properties, we have undertaken the work presented in this study of (SF-36) and (MLHFQ) among congestive heart failure patients. It is clear that each scale has a Cronbach's Alpha reliability higher than 0.70.

The study was carried out in three stages. There was no measure identified that complied with Pakistani standards, and most of the scales designed for Quality-of-Life Questionnaires (SF-36) among congestive heart failure patients. So ancient scale was used to gather data. Initially, participants were taught personal care concepts using teach-back. After 30 and 90 days of interventions, each participant was given an SF-36 questionnaire, and telephone interviews were done to measure re-admissions and quality of life ($N=36$). The data was acquired and processed using SPSS 25 and AMOS 23.

The validity of the construct Questionnaires (SF-36) and MLHFQ questionnaire and the present study overall supported to both questionnaires.

The Constructive, substantial relationships were established among both scales (SF-36) and MLHFQ questionnaire and Hotelling's T-Squared Test, representing with greater observation of researcher. According to prior research, a positive correlation between two variables might lead to a beneficial outcome. The (SF-36) and MLHFQ questionnaire. In addition, results also depicted that the Quality-of-Life. There was a positive connection between the three measures assessed by inter-correlation ($r = 0.25$ to 0.70) for the SF-36 and MLHFQ questionnaires, both of which were significant at the 0.05 level.

Factor analysis is performed on data acquired using a two questionnaire that were included 57 questions concerning dimensions on the Quality-of-Life Questionnaires (SF-36) include (36 items) and the Minnesota Living with Heart Failure Questionnaire include (21 items). The principal components analysis extraction technique was used for this study. The factor analysis findings suggest that there are eight components that explain 51.32 percent of the variation. This indicates that these three components demonstrate the difference between one and the other from the mean value.

CONCLUSION

The (SF-36) and the MLHFQ were shown to be a reliable and valid tool for determining the influence on the QOL of congestive heart failure patients. The use of this version of the Questionnaires will make assessing the QOL of congestive heart failure patient's smoother.

RECOMMENDATIONS

The Quality-of-Life Questionnaires (SF-36) and the Minnesota Living with Heart Failure Questionnaire may be employed in the context of Pakistani samples, it can be asserted. More study in other samples, particularly in Pakistan, is advised in future studies. It would be beneficial to incorporate various illnesses samples from other countries in order to evaluate for any consistent contextual biases in response.

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Conflict of Interest: Nil.

Authors' Contribution:

Author name	Contribution
Shaheen Nazakat	Author, Researcher
Dr. Kabir Ozigi Abdullahi	Supervisor, proof reading
Adnan Yaqoob	Proof reading, edit paper draft
Asif Hanif	Statistical analysis
Muhammad Sajid	Facilitation in data collection

REFERENCES

1. Awoke MS, Baptiste DL, Davidson P, Roberts A, Dennison-Himmelfarb C. A quasi-experimental study examining a nurse-led education program to improve knowledge, self-care, and reduce readmission for individuals with heart failure. *Contemporary nurse*. 2019 Jan 2;55(1):15-26.
2. McDonagh TA, Metra M, Adamo M, Gardner RS, Baumbach A, Böhm M, et al. 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: Developed by the Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC) With the special contribution of the Heart Failure Association (HFA) of the ESC. *Eur. Heart J*. 2021 Sep 21;42(36):3599-726.

3. Catchpool M, Ramchand J, Hare DL, Martyn M, Goranitis I. Mapping the Minnesota Living with Heart Failure Questionnaire (MLHFQ) onto the Assessment of Quality of Life 8D (AQoL-8D) utility scores. *Quality of Life Research*. 2020 Oct;29(10):2815-22.
4. Edelmann F, Knosalla C, Mörike K, Muth C, Prien P, Störk S, et al. Chronic heart failure. *Deutsches Ärzteblatt International*. 2018 Feb;115(8):124.
5. Jones NR, Roalfe AK, Adoki I, Hobbs FR, Taylor CJ. Survival of patients with chronic heart failure in the community: a systematic review and meta-analysis. *Eur. J. Heart Fail*. 2019 Nov;21(11):1306-25.
6. Supino PG, Borer JS, Franciosa JA, Preibisz JJ, Hochreiter C, Isom OW, et al. Acceptability and psychometric properties of the Minnesota Living with Heart Failure Questionnaire among patients undergoing heart valve surgery: validation and comparison with SF-36. *Eur. J. Heart Fail*. 2009 Apr 1;15(3):267-77.
7. Gonzalez-Saenz de Tejada M, Bilbao A, Ansola L, Quirós R, García-Perez L, Navarro G, et al. Responsiveness and minimal clinically important difference of the Minnesota living with heart failure questionnaire. *Health and Quality of Life Outcomes*. 2019 Dec;17(1):1-
8. Kularatna S, Senanayake S, Chen G, Parsonage W. Mapping the Minnesota living with heart failure questionnaire (MLHFQ) to EQ-5D-5L in patients with heart failure. *Health and Quality of Life Outcomes*. 2020 Dec;18(1):1-2.
9. Kusuma, DY, Shatri H, Alwi I, Abdullah M. (2019). Validity and Reliability Studies of the Indonesian Version of the Minnesota Living with Heart Failure Questionnaire (MLHFQ): Quality of Life Questionnaire for Patients with Chronic Heart Failure. *Acta Medica Indonesiana*, 51(1), 26-33.