ORIGINAL ARTICLE

EXPLORING AND DEVELOPING ITEMS MEASURING QUALITY OF LIFE CONSTRUCT AMONG HEART FAILURE PATIENTS IN MALAYSIA

Wan Marina Wan Ismail*[1], Zainuddin Awang[2] AND Idayubadilla Idris[3].

[1]Centre for Nursing Studies, Faculty of Health Sciences, University Teknologi MARA, Malaysia
[2]Faculty of Economics and Management Science, University Sultan Zainal Abidin
[3]Faculty of Medicine, University Kebangsaan, Malaysia

*Corresponding address: Wan Marina Wan Ismail
Email: wanmarina13@gmail.com

ABSTRACT

Heart failure is a chronic disease that spoils patients' quality of life (QoL) and is associated with both high hospital readmission rates and healthcare resource utilization such as emergency services. The purpose of this study is to measure the quality of life using the validated Minnesota Living with Heart Failure Questionnaire (MLWHF). The study used a non-experimental, quantitative design with a theoretical framework based on health-related quality of life among heart failure patients. A simple random sampling method was used, which covered the medical and cardio clinics in two tertiary and secondary hospitals. The overall data were collected for four weeks from these hospitals. The total number of respondents in this study was 200. SPSS version 25.0 was used to analyse the data. The instrument was composed of three components, and the first component included eight items that measured the patients' physical aspects. The second component measured other aspects that comprised eight items that covered social, work, and sexual topics, and the final component measured emotional aspects with five items. The overall MLHFQ scale consisted of 21 items. MLHFQ was translated into the Malay language by using back-to-back translation procedures by experts in their fields. The results of the exploratory factor analysis (EFA) found that all 21 items were accepted due to factor loading being more significant than 0.6. However, question number 16part three relaying other aspects had a factor loading of only 0.67. As a result, for local use, this instrument needs to rearrange the items measuring the construct into their respective components accordingly before proceeding with data collection in the field study. In conclusion, for local content, this instrument needs to rearrange the items measuring the construct into their respective components accordingly before proceeding with data collection in the field study.

Keywords: Quality of Life, Physical and Emotional, Heart Failure.

INTRODUCTION

Heart failure (HF) is a progressive condition that results in significant public healthcare issues, with the numbers increasing as one ages (Rosamond *et al*. 2008).HF is associated with a limitation of physical, social, and mental activities, i.e., withdrawal from activities and social contacts, depression, sleep disorders, dyspnoea, fatigue, loss of muscular mass, dietary restrictions, difficulties in maintaining sexual relations, progressive loss of self-reliance, a side effect of medication, and recurrent hospitalizations. All the above conditions have a considerable impact on the patient's HRQOL. They could explain why patients with HF are found worse HRQOL than the general population or patients suffering from other chronic disease such as cancer and coronary artery disease (Carvalho *et .al* 2009).

The prevalence of HF has increased in recent decades, and an estimated 6.5 million people in Europe, 5.7 million people in the USA, and 2.5 million people in Japan have HF. In Malaysia, it is estimated that approximately 10,000 patients suffer from HF, and every year, there are 1,000 new cases.

Primary health care is the appropriate setting to follow-up for patients with chronic HF, as it is a highly prevalent condition that requires frequent monitoring. Few studies have been performed in primary health care to investigate the QOL of patients with HF. This may hinder the implementation of clinical practice guidelines regarding the level of care. Primary care professional needs a simple and reliable instrument to measure and identify the intervention, treatment, and QOL needs of patients with HF. The Minnesota Living with Heart Failure Questionnaire (MLHFQ) is a disease-specific HRQOL instrument; it is also the most widely known and used. This tool has been adapted for use in over 32 languages and has demonstrated good psychometric properties in numerous studies (Garin O et al.,

2008). However, to date, the Malay version of MLHFQ is not reported. The present study focused on investigating heart failure (HF) quality of life using the MLHFQ translated in the Malaysian language.

The present study used a non-experimental, quantitative design with a theoretical framework based on health-related quality of life among heart failure patients. The instrument needs to rearrange the items measuring the construct into their respective components accordingly before proceeding with data collection in the field study.

METHODS

Research design
This descriptive-analytical, study used a self-administered questionnaire from the Minnesota Living with Heart Failure Questionnaire (MLHFQ). The content validity of the instrument has been evaluated through 2 experts Cardiologist from National Heart Centre, Ministry of Health, while the -reliability --was assessed based on the aspect of 'internal resolve' by using the test of Cronbach Alpha and resulted in physical components (0.92), Emotional (0.86) and other components (0.89).

Study population and sample
The study population is the average number of visits per five days to the cardiology clinics in both hospitals, an average of 80- 200 patients. A total of 200 patients with heart failure diseases were selected randomly from cardiology clinics from two tertiary hospitals in Selangor and Pahang. A systematic sampling method was used to avoid bias.

Instrument Used in the Quality of Life towards Heart failure patients
This article utilized a designed questionnaire composed of three parts, whereby each part refers to the instrument chosen for adaptation and modification.

The first part was used to measure the patients' physical aspects. This part consists of eight items in the questionnaire. The second part was used to measure eight items that covered social, work, and sexual topics, and the final part measured a patient's emotional aspects, including five items in MLHFQ. It measures the patient's perception of how heart failure symptoms have affected their life. Each item was graded on a scale of 0 to 10, with the resulting global sum score ranging between 0 and 210. Higher scores indicated a worse QoL.

This study adapted instruments from previous studies and modified certain statements to accommodate the current research. According to Awang, 2012; Noor *et al*. 2015; Awang *et al*. 2018); Mohamad *et al*. 2017& 2018; and Muda *et al*,2020), if the researcher adopted the existing instruments and modified the statement in a new environment. This is because the researcher needs to assess the items again through the Exploratory Factor Analysis (EFA) procedure. Certain items might no longer be useful in the new environment. Furthermore, the internal reliability of the instruments might change as well. Therefore, the present study conducted a pilot study and performed the EFA procedure for the items to ensure validity and reliability.

Ethical Statement
Ethical approval for the present work has been obtained from Medical Research & Ethics Committee, Ministry of Health, Malaysia, ethical approval number NMRR116-1835-31987(IIR)vide letter no. (5) KKM/NIHSEC/P16-1769 dated 5th December 2016.

RESULTS

Exploratory Factor Analysis for Quality-of-life construct Analysis.
The Quality of Life (QoL) construct is measured using the Minnesota Living with Heart Failure Index (MLHFQ) questionnaire, which consists of 21 items that are divided into three subscales: Physical (PH), Emotional (EO), and Others (OT). Each statement in the item is measured using an interval scale ranging from 1 (strongly disagree) to 10 (strongly agree) with each statement. The mean and standard deviation score for every item measuring the construct is presented in Table 1. From the table, it is evident that all are respondents have been agreed. The highest and the lowest mean averages have to be examined mindfully.

The Exploratory Factor Analysis (EFA) Procedure utilizing Principal Component Analysis (PCA) with Varimax Rotation was conducted on the 21 items of the quality-of-life construct. Table 2 show a significant value for the Bartlett Test (P-value < 0.05). The Measure of Sampling Adequacy by Kaiser-Meyer-Olkin (KMO) is 0.920, which exceeded the minimum value of 0.6 (Bahkia et al., 2019; Rahlin et al., 2019; Baistaman et al., 2020, 2020a; Ehido et al., 2020, 2020a). These two values (significance in the Bartlet Test, and

Table 1: The mean and standard deviation for QOL items

Item Statement	Mean	Std. Deviation
PH1 Causing swelling in your ankles or leg	8.82	.857
PH2 Making you sit or lie down to rest during the day	9.09	.878
PH3 Making your walking about or climbing stairs difficult	8.90	.893
PH4 Making your working around the house or yard difficult	8.95	.852
PH5 Making your going places away from home difficult	8.78	.973
PH6 Making you sleep well at night difficult	8.93	.888
PH7 Making you're doing things with friends or families difficult	9.07	.830
PH8 Making your working to earn a living difficult	9.00	.842
OT1 Making your recreational pastimes, sports, or hobbies difficult	9.26	.758
OT2 Making your sexual activities uneasy	8.80	.919
OT3 Making you eat less of the foods you like?	8.70	.952
OT4 Making you short of breath	8.76	.852
OT5 Making you tired, fatigued, or low on energy	8.93	.805
OT6 Making your stay in a hospital	8.99	.802
OT7 Costing you money for medical care	9.24	.862
OT8 Giving you side effects from treatments	8.76	.875
EO1 Making you feel you are a burden to your family or friends	9.13	.820
EO2 Making you feel a loss of self-control in your life	8.75	.916
EO3 Making you worry	8.89	.898
EO4 Making it difficult for you to concentrate or remember things	8.84	.831
EO5 Making you feel depressed	8.84	.829

Table 2: Value of KMO and Barlett's Test

KMO and Bartlett's Test	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.920
Bartlett's Test of Sphericity	
Approx. Chi-Square	2554.752
df	210
Sig	.000

the value KMO> 0.6) indicate that the data was suitable for the EFA procedure.

Table 3 presents three components that emerged based on the *eigenvalue* greater than 1.0. The results show the quality-of-life construct was measured using three components with a certain number of items in each element. Physical component items measured the construct at 24.493%, the emotional components items measured the construct at 16.011%, and the items under Other measured 22.697% of the construct. The total variance explained for the QOL construct is 63.200%. This value was acceptable as it exceeded the minimum requirement of 60% (Awang et al., 2015; Hoque et al., 2016, 2017, 2018; Shkeer&Awang, 2019; Awang et al., 2018; Bahkia et al., 2019; Alkhamaiseh et al., 2020).

Table 3: Total Variance Explained for every component.

	Rotation Sums of Squared Loadings		
Component	Eigenvalue	% of Variance	Cumulative %
Physical	5.143	24.493	24.493
Emotional	4.766	22.697	47.189
Others	3.362	16.011	**63.200**

Extraction Method: Principal Component Analysis.

The three components that emerged from the EFA procedure based on the Eigenvalue > 1.0 in Table 3 are supported by the Scree-Plot as presented in Figure 1.
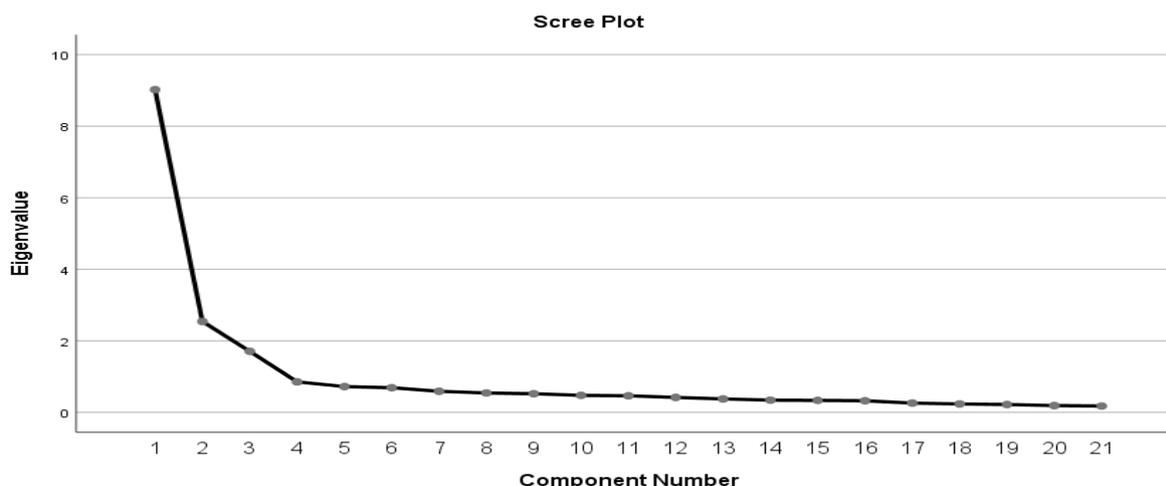
Figure 1: The Scree Plot indicate three components that emerged

Table 4 shows the distribution of items for the three components that measure the quality-of-life construct. Items PH1, PH2, PH3, PH4, PH5, PH6, PH7, and PH7 measure physical Components Physical, while items EO1, EO2, EO3, EO4, EO5, and EO6 measure emotional components. Subsequently, items OT1, OT2, OT3, OT4, OT5, OT6OT7 and OT8 measure all other components. All items in components 1,2, and 3 have achieved the minimum value of 0.6 (Hoque et al., 2018; Yahaya et al., 2018; Rahlin et al., 2019; Bahkia et al., 2019; Muda et al., 2020; Ehido et al., 2020, 2020a).

Table 4. Items to measure the quality-of-life constructs

Rotated Component Matrix			
	Component		
	1	2	3
PH1 Causing swelling in your ankles or leg	.716		
PH2 Making you sit or lie down to rest during the day	.764		
PH3 Making your walking about or climbing stairs difficult	.763		
PH4 Making your working around the house or yard difficult	.797		
PH5 Making your going places away from home difficult	.737		
PH6 Making your sleeping well at night difficult	.796		
PH7 Making you're doing things with your friends or family difficult	.710		
PH8 Making your working to earn a living difficult	.745		
OT1 Making your recreational pastimes, sports or hobbies difficult		.734	
OT2 Making your sexual activities		.730	
OT3 Making you eat less of the foods you like		.742	
OT4 Making you short of breath		.734	
OT5 Making you tired, fatigued, or low on energy		.779	
OT6 Making your stay in a hospital		.737	
OT7 Costing you money for medical care		.699	
OT8 Giving you side effects from treatments		.674	
EO1 Making you feel you are a burden to your family or friends			.688
EO2 Making you feel a loss of self-control in your life			.736
EO3 Making you worry			.776
EO4 Making it difficult for you to concentrate or remember things			.784
EO5 Making you feel depressed			.760

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

Finally, is to determine the internal reliability of instruments measuring QOL construct. The Cronbach's Alpha value for each component which reflects the internal reliability of the items is presented in Table 5. The Cronbach Alpha for all components exceeded 70%. Thus,

the study concluded that the instrument measuring the QOL construct has an acceptable internal reliability standard (Hair, Black, Babin, & Anderson, 2010). Table 5 shows that the Alpha Cronbach value for the Minnesota Living with Heart Failure (MLHFQ)

instrument had high reliability as the Alpha Cronbach value was 0.925for items under the physical component, 0.897 for items underemotional component, and 0.863 for items under others component.

Table 5: The reliability assessment for each component

Component	Number of Items	Cronbach's Alpha
Physical	8	0.925
Emotional	8	0.863
Others	5	0.897

DISCUSSION

The Exploratory Factor Analysis (EFA) results show that the constructs of quality of life among heart failure patients can be measured by using multiple dimensions or components, and several related items represent each. The MLHFQ, the most widely used questionnaire in heart failure patients, has recently been validated in Spanish patients who were followed for two months after discharge. The instrument showed acceptable sensitivity to change and good reliability and validity, but these results may be limited to heart failure patients usually seen in public health care. As recommended, internal consistency was satisfactory in all dimensions, with Cronbach alpha coefficients close to above or 0.7. The coefficients are like those of the original version and to those obtained by Garin et al. Based on the reliability analysis, the items for the components measuring physical, emotional, and others; help to measure QoL and demonstrate good internal consistency because the Alpha Cronbach value for the three components exceeded the set requirement of 0.7.

CONCLUSION

The Malaysian version of the MLHFQ has shown satisfactory reliability, and the factor analysis indicated three factors of interest. subsequently, this article attests that it could be a dependable and substantial instrument for distinguishing the quality of life among patients with heart disappointment in Malaysia. Healthcare professionals can use it in their clinical practice to improve the identification of patients with a compromised health-related quality of life. The Malaysian version of MLHFQ provides a holistic approach for measuring QOL. It also provides evidence of its potential for future use in research and clinical practice in heart failure patients seen in primary care. There is a shortage of relevant

data in the literature. Therefore, the researcher can rearrange the items for each component to measure the constructs of this attitude and can then use it for data collection purposes for actual research among heart failure patients in Malaysia.

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