

Predictors of Quality of Life in Patients with Heart Failure: A Literature Review

Fanni Okviasanti^{1,2}, Ah. Yusuf^{1*}, Ninuk Dian Kurniawati¹

¹. Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia.

². Faculty of Vocational Studies, Universitas Airlangga, Surabaya, Indonesia.

*Corresponding Author: Ah. Yusuf

Abstract

Heart failure (HF) is a chronic disease characterized by reduce heart efficiency affecting patients' quality of life (QoL). Patients with HF report lower QoL compared with general population and other patients with chronic disease. There are multidimensional factors affecting QoL. Therefore, it is important to identify factors that could be associated with changes in QoL to improve outcomes. The aim of this study was to identify significantly factors related to QoL in patients with HF according to the available literatures. The literatures were searched in appropriate database, using PICO framework, from January 2012 until August 2018. Eighteen relevant articles were found and reviewed. Factors that are significantly related to QoL in patient with HF can be grouped into 5 categories, i.e. physical factors include physical symptoms, physical activity, functional status, duration of HF, and multiple hospitalization; psychosocial factors include depression, optimism, exercise self-efficacy, and living independently; behavioral factors include self-care engagement, water and sodium restriction; spiritual factors include acceptance of illness and existensial well-being; and demographic characteristics include age, sex, education, economic and employment status. This review provides insight on potentially factors affecting QoL. Proper intervention in modifying those factors is expected to improve the quality of life.

Keywords: Heart failure, Quality of life, Health-related quality of life, Predictors.

Introduction

Heart failure (HF) is a chronic disease characterized by reduce heart efficiency to meet the body's metabolic [1]. HF becomes global burden disease, which attacks over 26 million people all over the world [2]. HF contributes to the incidence of life with disability among high-income males in several regions, i.e. North America, Oceania, Eastern and Western Europe, Southern Latin America, and Central Asia [3].

Patient's survival rate is worse than the other malignant disease, e.g. bowel, breast, or prostate cancer [4]. The incidence of HF continues to rise along with the increase in the elderly population and lifestyle change, although therapeutic advances have been developed to improve the prognosis [4, 5]. HF patients experience very distressing symptoms because of various physical symptoms burden, including dyspnea, fatigue, pain, edema, and sleep disturbance, which lead to depression [5-10].

Most of HF patients experience symptoms of anxiety, fear, and depression. These symptoms in several studies have reportedly affected the quality of life (QoL) [4, 9, 10]. Patients with HF have shown poor QoL [9] and report lower QoL compared with individuals in the general population and other chronic disease [11-13].

Poor QoL is caused by progressive symptoms to an advanced disease, disability, and frequent of hospital readmission which associated with increase in morbidity and mortality [5, 11, 14, 15]. HF with advanced stage is less responsive to medication. Therefore, palliative care approach is recommended by international heart failure guidelines to optimize symptom alleviation [4, 16, 17]. The main goal of HF palliative care is to reduce symptom burden and improve QoL [4,16-18]. Healthcare providers deliver care by focusing on helping patients to gain their

highest level of QoL, which is commonly considered subjective and influenced by many factors according to their specific condition [19]. QoL especially health-related quality of life (HRQoL) is a multidimensional factor that describes the effects of health condition and its symptoms on individual overall well-being, including physical, functional, emotional, and social dimension [20-23]. Multidimensional factors related to QoL/HRQoL have been widely studied [22, 23]. According to cross-sectional studies, each dimensions are interrelated.

The relationship between sociodemographic and clinical characteristics with physical and psychosocial factors are reciprocal. On the other hand, psychosocial factors are related to behavioral factors, while behavioral factors are related to physical factors [22]. Hence, conducting review and obtaining full understanding about factors that could be associated with changes in QoL/HRQoL is pivotal to guide more effective nursing interventions to improve outcomes. It also assists creating reasonable judgement, supporting programs, and rehabilitation guidance [19, 24]. The aim of this review was to identify significantly factors related to QoL in patients with HF.

Methods

Articles were searched using PICO framework from Medline, CINAHL, ProQuest, Science Direct, Springer Link, and Scopus database from January 2012 until August 2018. Keywords including “heart failure”, “quality of life”, “chronic heart failure”, “health-related quality of life”, “cardiac failure”, “cardiovascular disease” were used in database searching. Abstracts and full texts were reviewed to obtain eligible articles based on criteria. A total of 18 articles met the following criteria: were using quantitative research design to find relationship of several related variables; included samples of HF patients; and focused on factors related quality of life/health-related quality of life.

Results

The 18 eligible articles involved 4980 patients with HF [9, 10, 19, 21-35]. The mean age of patients in all studies was elderly (60-64 years) and old age category (65-90 years) (each consisting of 7 studies), while four studies were in adult age (45-59 years) (based

on United Nations of age classification) [22, 23, 27, 28]. Most of participants were outpatients (12 studies) and only a small part were inpatients (5 studies), while just one study used both outpatients and inpatients for collecting the data [31]. Most of them were recruited based on New York Heart Association (NYHA) functional classification status (7 studies), even though a few others used criteria: left ventricle ejection fraction (LVEF) [34], general chronic heart failure (CHF) [19, 25, 26, 28], non-diastolic HF [21, 35], both NYHA functional class and LVEF [9, 24] and also both NYHA functional class and non-diastolic HF [23, 31].

Most of reviewed articles used cross-sectional descriptive correlational design in methodology (14 articles), which one of those 14 articles was secondary analysis of cross-sectional data from a longitudinal study design [32]. Another study design and key findings are outlined in Table 1.

Quality of Life (QoL) vs Health-related Quality of Life (HRQoL)

Quality of life as defined by World Health Organization (WHO) is “an individual’s perception of his/her position in life in the context of the culture and value systems in which he/she lives, and in relation to his/her goals, expectations, standards, and concerns. It is a broad-ranging concept, incorporating in a complex way the person’s physical health, psychological state, level of independence, social relationships, and their relationship to salient features of their environment” [36].

Because of QoL is not always determined by health status, HRQoL is specified as part of QoL. HRQoL is defined as one aspect of quality of life that describes the effects of health, illness, and treatment on individual’s quality of life. In practice, both the terms QoL and HRQoL are often used interchangeably, although the terms do not appraise the same concept [20, 37, 38]. Among the identified studies, 11 articles used health-related quality of life (HRQoL) terminology to define the effects of health condition and its symptoms on individual overall well-being, while another 7 articles used the term quality of life (QoL) [9, 10, 24, 26, 30, 32, 34].

However, the instruments used to measure both the terminology tend to be the same. Minnesota Living with Heart Failure Questionnaire (MLwHFQ) was the most

commonly used in all reviewed articles to measure both HRQoL and QoL [9, 19, 21-27, 29, 33, 35]. Two studies used Kansas City Cardiomyopathy Questionnaire (KCCQ) to measure self-reported HRQoL [31, 34], while other articles used a variety of instruments, i.e. World Health Organization Quality of Life-BREF (WHOQOL-BREF) in combination with MLwHFQ [19], Short Form-12 (SF-12) [32], SF-36 [28], Nottingham Health Profile (NHP) [30], and McGill Quality of Life (MQoL) [10].

Factors related to QoL/HRQoL

According to the articles that have been reviewed, there were several factors related to QoL/HRQoL in patients with HF. At least 18 variables have been studied to find a significant relationship to QoL/HRQoL (see Table 1.). Sociodemographic and clinical characteristic were a variable that is always investigated as either an independent or covariate variable. Depression was the most studied independent variables [9, 22, 23, 26, 27, 35], followed by physical function (involved LVEF and NYHA functional classification although both of them were sometimes included in clinical characteristic variable in several studies) [10, 19, 21, 26, 34] and physical symptoms [10, 22, 23, 26, 27]. Among the reviewed articles, the following were significant factors for QoL/HRQoL:

Physical factors, include physical symptoms, physical activity, functional status, duration of HF, and multiple hospitalization. Physical symptoms were widely investigated as predictor of QoL [26-28], followed by functional status [9, 19, 21, 24, 28, 34]. Physical symptoms mediated the relationship between depressive symptoms and HRQoL [23]. One typical study of sleep disturbance as one of physical symptoms on patients' and their spousal caregiver showed that each individual's sleep disturbance predicted their own poor physical and mental well-being while spousal caregivers' sleep disturbance predicted their partners' mental well-being [32].

Improvement in HF symptoms was associated with improvement in HRQoL over 12 months [22]. On the other hand, functional status was a mediator between HRQoL and cardiac event-free survival. Cardiac event-free survival was significantly worse in patients who had worse HRQoL or poorer functional status (HF stages III and IV in NYHA).

Patients who had better functional status had better HRQoL [21]. Others physical factors that were significantly related to QoL/HRQoL were physical inactivity [34], duration of HF [26], [28], and multiple hospitalization (>4 times) [9, 28]. Psychosocial factors, include depression, optimism, exercise self-efficacy, and living independently. Either depressive alone [23, 26, 27] or combined with perceived control [23] were associated with HRQoL. Individuals with higher age was related to more optimism than younger age. Optimism was associated with higher generic HRQoL [29].

One study on CHF patients showed that self-care was prospectively associated with disease-specific HRQoL, which was fully accounted for by depression, and partially accounted for by anxiety and type-D personality. However, changes in self-care independently within a person did not affect HRQoL [35]. In study by Suresh [33], self-efficacy alone was not significantly correlated to HRQoL, but specific self-efficacy to do exercise was studied by Lee [34] had significant correlation to QoL among individuals with CHF. Another living independently variable was also identified as significant correlated factor of QoL [24]. Behavioral factors, include self-care engagement, water and sodium restriction.

The self-care engagement in HF self-care behaviors affects HRQoL. The worst HRQoL was reported when self-care was poor, whereas the best HRQoL was associated with low levels of self-care engagement [27]. Water and sodium restriction were also associated with QoL through its effect on physical symptoms, that mediate the relationship between depression and QoL [23]. Spiritual factors, include acceptance of illness and existential well-being. Acceptance of illness was the only independent predictor of QoL in all NHP domains [30].

Quality of life was also significantly associated with existential well-being [10]. Demographic characteristics include age, sex, education, economic and employment status. Age and sex were identified as significant correlated factors of QoL in HF patients [24, 26]. Education here include patient's illness knowledge and level of education. Illness knowledge had been studied correlated with both self-care behavior and QoL. Illness knowledge and age were identified as

significant correlated factors of self-care behaviors [24]. Furthermore, older age, low level of education, unemployment, and poor

economic situation were factors associated with poor QoL, and high levels of anxiety and depression [9, 10, 28].

Table 1: Summary of factors related to quality of life in patients with heart failure

No.	Author (first), year	Sample, mean age in years (SD)	Design	Measurement	Instrument	Outcome
1.	Suresh, 2017	n=91, 63 (13.02), outpatients, NYHA I-IV	Cross-sectional descriptive correlational design	Self efficacy HRQoL	CSS MLWHFQ	Self-efficacy was not significantly correlated to HRQoL.
2.	Lee, 2017	n=116, 62 (15), outpatients, LVEF \leq 45%	Cross-sectional descriptive correlational design	Physical functioning Physical activity Exercise self-efficacy QoL	LVEF level and NYHA classification MET Questionnaire developed by Resnick and Jenkins KCCQ	Quality of life were significant related to poverty, functional status, physical inactivity, and exercise self-efficacy.
3.	Kessing, 2017	n=495, 66.1 (10.5), outpatients, non-diastolic HF	Longitudinal study	Self care HRQoL Depression Anxiety Type D-personality	EHFScB-9 MLWHFQ BDI SAD DS14	Self-care was prospectively associated with better disease-specific HRQoL in patients with HF, which was fully accounted for by depression, and partially accounted for by anxiety and Type D personality. Changes in self-care within a person did not affect HRQoL.
4.	Liu, 2014	n=141, 68 (13.7), outpatients, LVEF \leq 40%, NYHA I-IV	Cross-sectional descriptive correlational design	Illness knowledge Self-care behavior QoL	DHFKS EHFScB MLWHFQ	Illness knowledge correlated with both self-care behaviors and quality of life. Illness knowledge and age were identified as significant correlated factors of self-care behaviors; and functional class, living independently, and age were identified as significant correlated factors of quality of life.
5.	Chu, 2012	n=114, 65.8 (12.4), outpatients, all ambulatory CHF	Cross-sectional descriptive correlational design	HRQoL Functional status Comorbidity Individual characteristics	WHOQoL-B REF MLWHFQ NYHA classification CCI Medical record, interview	MLHFQ was better able to differentiate sex, comorbidity, and functional status. The perceived economic status, functional status, and sex were factors identified as having an effect on HRQOL.
6.	Banerjee, 2014	n=423, 63 (12), outpatients, general HF	Cross-sectional descriptive correlational design	HRQoL Perceived control Psychological	MLWHFQ CAS-R BSI NYHA, CCI,	There was a weak relationship between perceived control and HRQOL when considered in the presence of demographic, clinical, and psychological factors.

No.	Author (first), year	Sample, mean age in years (SD)	Design	Measurement	Instrument	Outcome
				status Demographic and clinical variables	medical records, interview	
7.	Hwang, 2014	n=133, 64.2 (12.7), outpatients, general HF	Cross-sectional descriptive correlational design	QoL Physical symptoms of dyspnea and fatigue Depression Sociodemographic Disease severity	MLWHFQ PFSDQ-M BSI Sociodemographic questionnaire NYHA classification, LVEF	Age, duration of HF, physical symptoms, and depression are important predictors of QOL in HF patients.
8.	Auld, 2017	n=202, 57 (13), outpatients, NYHA II-IV	Cohort	Sociodemographic and clinical variables Physical symptoms Depressive symptoms Self-care behaviors HRQoL	Sociodemographic questionnaire, CCI, Seattle HF Model score, Duke Activity Status Index HFSPS PHQ9 SCHFI v.6 MLWHFQ	HRQOL is dependent on both the severity of physical and depressive symptoms and the level of engagement in HF self-care behaviors. In addition, better emotional HRQOL was reported when both physical symptom and self-care behaviors were high.
9.	Rahnavard, 2014	n=1840, 58.25, outpatients, general CHF	Cross-sectional descriptive correlational design	Demographic and clinical characteristics HRQoL	Questionnaire SF-36	A significant relationship was found between the HRQOL and the employment status, level of education, being cared for at home, functional capacity, disease duration, frequency of medical encounter and hospitalization, duration of hypertension and concurrent CHF, presence of edema, presence of disease symptoms and morbidities, intensity of fatigue at the study time and previous months, and the type of medications.
10.	Kraai, 2017	n=86, 70 (9), outpatients, NYHA I-IV	Cross-sectional descriptive correlational design	Dispositional optimism HRQoL Background characteristics	LOT-R MLWHFQ Interview and medical record	Higher age was related to more optimism and optimism was associated with higher generic HRQoL
11.	Heo, 2014	n=109, 58 (14), inpatients, non-diastol	Cross-sectional descriptive correlational design	Psychosocial variables: Depressive	PHQ-9 CAS-R	Depressive symptoms and sodium intake were associated with physical symptoms, and depressive symptoms and

No.	Author (first), year	Sample, mean age in years (SD)	Design	Measurement	Instrument	Outcome
		ic HF, NYHA II-IV		symptoms Perceived control Social support Behavioral variables: Medication adherence Sodium intake Self-care management Outcomes: Physical symptoms HRQoL Covariate: Sociodemographic and clinical characteristics	MSPSS Medication event monitoring system Urine sodium SCHFI SSQ-HF MLWHFQ Sociodemographic and clinical questionnaire	perceived control were associated with health-related quality of life. Physical symptoms mediated the relationship between depressive symptoms and health-related quality of life.
12.	Obieglo, 2015	n=100, 63.2 (12.2), inpatients, NYHA II-IV	Cross-sectional descriptive correlational design	QoL Acceptance of illness	NHP AIS	Acceptance of illness was the only independent predictor of quality of life in all the NHP domains: energy, pain, emotional reactions, sleep, social isolation and mobility.
13.	Aggelopoulou, 2017	n=231, 66.1 (10.1), inpatients, NYHA II-IV, EF ≤ 35%	Cross-sectional descriptive correlational design	Sociodemographic Anxiety Depression QoL	Medical record STAI MQ MLWHFQ	Factors associated with poor quality of life and high levels of anxiety and depression were older age, low level of education, unemployment, poor economic situation, multiple hospitalizations (>4 times) and heart failure stages III and IV in NYHA
14.	Chan, 2016	n=112, 81.5 (8.5), inpatients, NYHA III-IV	Cross-sectional descriptive correlational design	Demographic and clinical background Physical functioning Severity of symptom QoL	Demographic and clinical questionnaire Staircase ADL and PPS ESAS MQoL	Quality of life was significantly associated with existential wellbeing, physical wellbeing, psychological wellbeing and educational level.
15.	Heo, 2018	n=94, 58 (14),	Longitudinal study	HRQoL Heart failure	MLWHF	Improvement in HF symptoms was associated with improvement

No.	Author (first), year	Sample, mean age in years (SD)	Design	Measurement	Instrument	Outcome
		inpatients, NYHA II-IV		symptom Depressive symptom Perceived control Social support Medication adherence Sodium intake Sociodemographic and clinical characteristics	SSQ-HF PHQ-9 CAS-R MSPSS Medication event monitoring system Urine sodium Sociodemographic and clinical questionnaire	in HRQOL over 12 months.
16.	Wu, 2016	n=313, 62 (11), outpatients, non-diastolic HF	Prospective, observational study	Cardiac event free survival HRQoL Functional status Demographic and clinical characteristics	Patient interview, hospital database, death certificate review MLWHFQ DASI Demographic and clinical questionnaire	Cardiac event-free survival was significantly worse in patients who had worse HRQOL or poorer functional status. Patients who had better functional status had better HRQOL. Functional status was a mediator between HRQOL and cardiac event-free survival.
17.	Gathright, 2015	n=302, 68 (9.6), inpatient and outpatients, NYHA II-III, non-diastolic HF	Cross-sectional descriptive correlational design	Self-reported HRQoL Cognitive function: Attention Executive function Memory Visuospatial ability	KCCQ Stoop Word and Color subtests, Letter Number Sequencing, and the Trail Making Test A Trail Making Test B, the Stroop Color Word subtest, and the Frontal Assessment Battery. Rey Auditory	Cognitive function generally did not predict HRQoL in HF patients. The correlates of HRQoL in HF do not appear to include mild cognitive impairment.

No.	Author (first), year	Sample, mean age in years (SD)	Design	Measurement	Instrument	Outcome
				Covariate:	Verbal Learning Test, Learning Over Time, True Hits, Short Delay, and Long Delay scores. Rey Complex Figure Copy Task. PHQ, CCI, NYHA class, AMNART	
18.	Al-Rawashdeh, 2016	n=78, 62,2 (12,4) patients-day, outpatients, NYHA I-IV	Secondary analysis of cross-sectional data from a longitudinal study designed	Sleep disturbance QoL	Combination questionnaire SF-12 Health Survey	Each individual's sleep disturbance predicted their own poor physical and mental well-being while spousal caregivers' sleep disturbance predicted their partners' mental well-being. Patients' mental well-being is sensitive to their spouses' sleep disturbance

Note: QoL (Quality of Life), HRQoL (Health Related Quality of Life), CSS (Cardiac Self-Efficacy Scale), MLWHFQ (Minnesota Living with HF Questionnaire), LVEF (Left Ventricular Ejection Fraction), NYHA (New York Heart Association), MET (Metabolic Equivalent Task score), KCCQ (Kansas City Cardiomyopathy Questionnaire), EHFSB-9 (European Heart Failure Self-care Behaviour scale), BDI (Beck Depression Inventory), SAD (Symptoms of Anxiety-Depression index), DS14 (Type D Personality Scale), DHFKS (Dutch Heart Failure Knowledge Scale), WHOQOL BREF (World Health Organization Quality of Life BREF), CCI (Charlson Comorbidity Index), CAS-R (Control Attitude Scale-Revised), BSI (Brief Symptom Inventory), PFSDQ-M (Pulmonary Function Status and Dyspnea Questionnaire), HFSPS (HF Somatic Perception Scale), PHQ9 (Patient Health Questionnaire-9), SCHFI v.6 (Self Care of HF Index), SF (Short Form-12/36), LOT-R (Life Orientation Test-Revised), SSQ-HF (Symptom Status Questionnaire-Heart Failure), MSPSS (Multidimensional Scale of Perceived Social Support), NHP (Nottingham Health Profile), AIS (Acceptance of Illness), STAI (State-Trait Anxiety Inventory), MQ (Maastricht Questionnaire), ADL (Activity Daily Living), PPS (Palliative Performance Scale), ESAS (Edmonton Symptom Assessment Scale), MQOL (McGill Quality of Life), DASI (Duke Activity Status Index), AMNART (North American Adult Reading Test)

Discussion

Patients' with heart failure experience various symptoms burden which are affecting their QoL [6, 8]. As HF progresses, patients perform an increase in symptom severity, reduced functional capacity, increased emotional distress, and worsening QoL which causes physical, emotional, social, and spiritual changes in individuals [7, 39].

Hence, this review attempts to identify factors that significantly influence changes in the QoL of HF patients so that appropriate interventions can be given to improve QoL. According to the review, the average age of HF patients was elderly and old age category.

This is in accordance with the nature of chronic disease which is usually happens to elderly people. Globally, the incidence of HF is predicted to continue to rise along with an increase in the aging population [2, 4]. The NYHA functional classification was commonly used in the review articles to determine personal HF status.

This is because NYHA functional classification measures how many symptoms of heart failure limit patients' activity. The rating scale is subjective and can change over

time according to the severity of symptoms of structural heart disease [1, 40, 41]. Among the identified studies, MLwHFQ was commonly used to measure QoL/HRQoL. This instrument is one of disease-specific patient-reported outcome measures (PROMs) that measures multiple aspects of HRQoL which are relevant to a specific disease group and are more sensitive and responsive in detecting change. In CHF, MLwHFQ was tend to be more sensitive than SF-12 and SF-36 for detecting clinically pivotal changes over time [20].

Furthermore, this instrument is appealing in clinical setting because it is short, easily understood by ill and elderly individuals, and easy to score [19]. Another disease-specific instrument which commonly used to measure QoL/HRQoL in HF patients was KCCQ. However, in this review study, those instrument was only used in 2 studies [31, 34]. The authors choose the instrument because the questionnaire was highly rated by an expert panel, which awarded it adequate scores for the attribute conceptual model, reasonable scores for validity, and the highest score for change sensitivity [42].

The KCCQ also demonstrates good psychometric properties. It is more contemporary and has a better factor structure than MLwHFQ [43, 44]. Physical symptoms and functional status were two important physical factors as predictor of QoL in this current study. Physical symptoms are common in HF patients because of inability of the heart to pump blood in order to meet the body's need. Symptomatic distress involves not only physical distress but also the limitation capability to do activities of daily living and sense of life control, which become the main issue of poor QoL [45]. NYHA functional classification was used to assess both functional status and disease severity in other studies of HF patients.

A higher class of NYHA has been related to escalation of both hospitalization and mortality risk [46, 47]. Consistent with previous studies, factors associated with poor QoL were NYHA class III and IV, while patients who experience better functional status had better HRQoL [9, 21]. Depression was pivotal psychosocial factors as predictor of QoL. Depression is a common comorbid in patients with HF. The prevalence of depression based on a literature review was

16,7% to 70% and 23,8% to 67% in outpatients and inpatients, respectively [48]. Increased symptoms of depression in HF patients was significantly increase higher prediction of mortality [48]. One study showed that after 2 years of follow-up, patients with a higher depression scores were significantly had a higher mortality rate than those with a lower scores. Another study also stated that moderate to severe depression can increase risk of returning to hospital earlier in HF patients who experience preserved systolic function [49].

This is supported by a study that showed the state of depression was associated with patients non-compliance with treatment so that it was possible to experience more frequent exacerbation states [50]. Consistent with previous studies, this current study also showed that HRQoL was dependent on both severity of physical and depressive symptoms [23, 26, 27]. Therefore, interventions that support psychological change are considered to have more influence than interventions that only induce physiological changes [51]. Among the potential correlates, depressive symptoms and sodium intake were associated with physical symptoms [23].

Whereas sodium intake was affected by self-care behavior. In HF patients, adherence to restrict sodium intake was poor [52], even after dietary intervention. Self-care management in patients with HF was also very poor [53]. These factors likely contributed to increase symptom expression. Several key points of self-care were self-care behavior change the strength of the relationship between physical and depressive symptoms and HRQoL in adults with symptomatic HF; the better self-care, the less symptoms affect HRQoL; and the best HRQoL was reported when both symptoms and self-care were low, whereas the worst HRQoL was reported when symptoms were severe but self-care was low [27]. In the current study, existential well-being was associated with QoL.

According to the study conducted by Park [54], existential well-being was related to religiosity/spirituality (R/S) aspects. In particularly, daily spiritual experiences were linked with higher existential well-being and predicted less subsequent spiritual strain. These results are consistent with the view that in advanced disease, R/S may have

potent influences on existential aspects. Interventions that increase R/S are expected to improve QoL.

Conclusions

This review provides insight on potentially factors affecting quality of life in patients with heart failure. There are 5 categories factors that affect QoL, i.e. physical factors, psychosocial factors, behavioral factors, spiritual factors, and demographic characteristic. Proper intervention in modifying those factors is expected to improve the quality of life.

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