



Predictors of Quality of Life in Patients with Heart Disease

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Abstract

Individuals with heart disease have been found to have more negative psychological and physical effects that impact their quality of life (QoL) than the general population. Spiritual well-being is considered a protective factor associated with QoL in people with heart disease. Therefore, the current research seeks to evaluate whether sociodemographic factors and spiritual well-being predict QoL among patients with heart disease. A total of 500 patients who were selected through a convenient sampling method from an Iranian hospital participated in this descriptive-correlational study. Data were collected using the McGill QoL Questionnaire, the Spiritual Well-being Scale, and demographic variables. The data analysis included descriptive and inferential statistics powered by SPSS (v. 23). Following multivariate analyses, findings revealed that those participants with their main source of income derived from family or a government pension and with College or intermediate educational levels were more likely to have higher QoL. Those participants with average or poor socioeconomic status reported higher QoL than those who were more affluent. Furthermore, younger patients (-0.2 , 95% CI -0.3 to -0.003 , $p=0.016$) and those with higher social support (0.7 , 95% CI 0.2 to 1.3 , $p=0.006$) and spiritual well-being (0.2 , 95% CI 0.1 to 0.3 , $p<0.001$) had significantly better QoL. In the current study, spiritual well-being and social support led to reduced negative psychological sequelae and improved QoL in cardiac patients.

Keywords Quality of life · Spirituality · Social support · Heart disease

Introduction

Globally, cardiovascular disease is the leading cause of death (Benjamin et al. 2019). It is estimated that 17 million people die from heart disease every year, which signifies approximately one-third of all deaths around the world (Menotti et al. 2015).

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By 2030, it is expected that a total of 23.6 million deaths will be the result of heart disease worldwide. The burden of this disease is considered to be a serious threat in developing countries (Ahmadi et al. 2016). For instance, 35 of every 100 people in Iran have heart disease, which imposes a significant economic burden on patients, families, and the broader healthcare system (Maracy et al. 2015).

Patients with heart disease often experience co-occurring physical and psychological effects (Wang et al. 2014). Cardiac patients can suffer from multiple physical symptoms, such as limited physical capacity, fatigue, pain, and shortness of breath (Nouhi and Jahani 2017). Anxiety, depression, psychological distress, and anger are also commonly experienced (Alvarenga and Byrne 2016). These patients are also more likely to report financial concerns than the general population (Muhammad et al. 2014). A marked impairment on lifestyle and future aspirations can lead to social isolation (Nouhi and Jahani 2017). Research has indicated that negative physical and psychological factors have a direct association with quality of life (QoL) (Hare et al. 2013; Hayes et al. 2015). In addition to these findings, frequent hospitalizations and the side effects of treatment reduce the QoL of cardiac patients (Fan et al. 2015).

Quality of Life

QoL is a complex, multidimensional concept that describes a person's perceptions about his or her physical, social, functional, and psychological well-being (Soleimani et al. 2016; Sherman et al. 2010). An individual's QoL serves an important construct as a measure of health. Therefore, it is an important consideration in an individual's health assessment and treatment outcomes (Mielck et al. 2014). As such, low QoL is known to affect the treatment process (Larsson et al. 2014). Cardiovascular disease is a chronic ailment found to impact patients' QoL over time (Komaslasari et al. 2019). A decrease in QoL is associated with frequent re-admissions and hospital stays (Garin et al. 2014). Furthermore, poor health related to QoL is a strong predictor of morbidity and mortality in patients with coronary heart disease (Schron et al. 2014; Brown and Clark 2013).

Based on the results of previous studies, several factors can affect the QoL in patients with heart disease. Perceived social support has been found to be an important determinant of health-related QoL in older people. Social support increases an individual's ability to cope with stress, including stressors associated with chronic heart disease (Karatas and Bostanoglu 2017). Patients who receive inadequate social support may experience poor QoL (Wang et al. 2014; Leung et al. 2014). A review of the literature showed that increased social support was a protective factor in the reduction of physical and mental illness, as well as the mortality rates of heart disease patients (Huang et al. 2010; Dickens et al. 2012). Another study found that the QoL in patients with a good socioeconomic status was higher than their lower-income counterparts (Dickens et al. 2012). In addition, research has found that the presence of spiritual well-being and purpose in life leads to more positive attitudes in patients with heart disease, which positively affects their reported QoL (Weber and Pargament 2014). The spiritual and

religious dimensions reported during past research have also been found an increase an individual's ability to cope with their complex health needs (Thuné-Boyle et al. 2013).

Wellness and Spiritual Well-Being

Wellness is defined as the integration of physical, mental, social, and spiritual well-being (Anye et al. 2013). Generally, spiritual well-being provides a sense of meaning and purpose in life. It also provides a sense of connection, both to a higher power and other people (Dalmida et al. 2011). Self-transcendence is associated with a life's purpose and an understanding of an awareness of something or someone other than oneself (Sharpnack et al. 2011). Through self-transcendence, one can feel meaning in life (Wong 2016). Reed (2008) described the theory of self-transcendence as the ability to expand one's relationship to others and his or her environment. For many patients, a relationship with a spiritual being or god provides hope, which helps them adapt and cope with their illness.

Spiritual well-being is an essential component of QoL (Walker et al. 2017; Bai et al. 2014) that has been referred to as an individual's ability to find meaning and purpose in life. Spiritual well-being has been reported as being a coping mechanism for people with chronic health problems, especially regarding the management of stress, dissatisfaction, loneliness, depression, and grief associated with illness (Sun et al. 2016). In particular, a patient with heart disease may find that spiritual well-being could promote his or her ability to cope with his or her disease and its related complications (Gonzalez et al. 2014; Shukla and Rishi 2014). Religious beliefs are associated with, but not always linked to, definitions of spiritual well-being. However, having purpose in life is associated with spiritual well-being, which can result in positive physical and psychological health benefits for heart disease patients (Yaghoobzadeh et al. 2018). Spirituality has also been found to be a helpful way to reduce symptoms of depression and distress, and improve the QoL of cardiac patients by moderating negative emotions (Spatuzzi et al. 2019).

Aims of this Study

Given the chronic nature of heart disease and its impact on a patient's QoL, the assessment of QoL becomes essential. Since QoL is viewed as being an important outcome of health care, a critical role of healthcare providers involves helping patients maintain or improve their QoL. Hence, the present study sought to determine the role of spiritual well-being as a predictor of QoL among a sample of Iranian cardiac patients.

Materials and Methods

Participants

A descriptive, cross-sectional correlational design was used to determine the predictive factors of QoL among a sample of Iranian cardiac patients. A convenience

sampling method was used for the main sample of patients who were hospitalized in a major tertiary Iranian heart institute over a 4-month period (between May and August, 2016). The inclusion criteria were comprised of a diagnosis of cardiovascular disease by qualified doctors, the ability to orally communicate, the stability of a patient's vital signs, a hospital stay of at least 24 h, and an interest in participating in the study. Over a 3-month period, a convenience sample of 650 cardiac patients was referred to the study. Of these referred patients, 598 met the inclusion criteria. A total of 500 of these patients were approached to participate in the study, and a response rate of 83.7% was received. A post hoc power analysis demonstrated that a sample size of 500 had a sufficient amount of significance (> 0.90) to detect a mid-size difference by using a general linear model with an α value of ≤ 0.05 .

Measures

The questionnaire consisted of three main parts: (1) basic demographics, (2) a QoL assessment through the use of the 17-item McGill QOL (MQOL) Questionnaire, and (3) spiritual well-being by using a known Spiritual Well-being Scale (SWBS). Questions that elicited demographic information included the patient's age, sex, marital status, education level, socioeconomic status, and primary source of income. Next, data related to a participant's experience of death, social support, and religious beliefs were also collected. Perceived social support and religiosity were measured by using empirically validated survey scales developed by nursing researchers. However, we adapted and simplified the aforementioned scales, in order to prevent respondents from experiencing a potential burden caused by their health limitations. For each item in the utilized measurement scales, we asked our respondents to rate their responses by using a 10-point Likert-type scale. For example, participants rated their social support from 1 to 10 (1 = the least, 10 = the most) and the strength of their religious belief from 1 to 10 (1 = the weakest, 10 = the strongest).

McGill QOL (MQOL) Questionnaire

The MQOL Questionnaire developed by Cohen et al. (1995) is a 17-item multidimensional measurement that captures the QoL of people with life-threatening illnesses (Cohen et al. 1995). The MQOL has been translated to Persian with documented validity and reliability, in order to assess the QoL in Iranian patients with cancer (Shahidi et al. 2008). The MQOL consists of three subscales, which include holistic perspectives of well-being related to QoL (1 question), physical problems (4 questions), and psychological effects (12 questions). The MQOL items are scored on a 0–10 scale—with higher scores reflecting higher levels of QoL (total range 0–170). The MQOL is evaluated with both individual subscale scores and an overall composite score. The validity and reliability of the MQOL have been well-established (von Gruenigen et al. 2010; Soleimani et al. 2016). The value of the Cronbach's alpha was 0.67, which shows that the data used in this study are highly consistent.

Spiritual Well-Being Scale

Spirituality was assessed by using an adapted version of the 20-item Spiritual Well-Being Scale developed by Paloutzian and Ellison (1982). It taps into two related constructs: religious well-being (10 items) and existential well-being (10 items). Religious well-being assesses the quality of a person's relationship with a god or higher power. Existential well-being reflects a person's sense of meaning and purpose in life. Each item has a six-point Likert scale, ranging from 'agree a lot' (6) to 'disagree a lot' (1). Responses were summed up by yielding a cumulative score that ranges from 10 to 60 on each subscale (Paloutzian and Ellison 1982). The validity and reliability of this questionnaire were confirmed in the previous studies about patients with acute myocardial infarction (Soleimani et al. 2017b) and women with breast cancer (Alizadeh et al. 2018). For this study, the internal consistency reliability was 0.67 for spiritual well-being, using Cronbach's alpha.

Ethical Consideration

The study was approved by the ethics committee of Qazvin University of Medical Sciences (QUMS.REC.1394.11). In addition, patients were informed of the study's aims, and they were told that participation was voluntary before they were asked to sign an informed consent form. All personal data were anonymized by assigning generic codes to record the responses of participants.

Statistical Analysis

The Statistical Package for Social Sciences, version 23.0 (SPSS Inc., Chicago, IL, USA), was used for data analysis. All demographic variables were summarized using frequencies and percentages for categorical variables, as well as mean and standard deviation (SD) for quantitative variables. The predictors associated with QoL were determined using multivariate regression model when normality assumptions were satisfied. Statistical significance was set at $p < 0.05$.

Results

Table 1 shows personal characteristics of the study participants, including gender, marital status, highest level of educational attainment, socioeconomic status, primary source of income, social support, religious beliefs, and spiritual well-being. The results of the study indicated that the means (SD) of the two main variables, QoL, and spiritual well-being were 98.86 (12.75) and 86.21 (12.46), respectively. The mean age of participants (SD) was 60.68 (10.34). More than half of the sample were married ($n = 406$, 81.2%). Most participants reported having no formal education (53.2%) and a midrange income ($n = 353$, 70.6%).

Table 1 Demographic characteristics of the study participants

Demographic characteristics	Number (%)
Gender	
Male	238 (47.6)
Female	262 (52.4)
Marriage	
Married	406 (81.2)
Widowed/divorced	94 (18.8)
Level of educational attainment	
No formal education	266 (53.2)
Primary	19 (21.8)
Intermediate	58 (11.6)
High school	55 (11)
Collegiate	12 (2.4)
Socioeconomic status	
Poor	127 (25.4)
Average	353 (70.6)
Good	20 (4)
Primary source of income	
Employment	211(42.2)
Family	32 (6.4)
Friends	5 (1)
Pension from the government	203 (40.6)
Charitable giving	49 (9.8)
Death experiences	
Yes	17 (3.4)
No	483 (96.6)
	Mean (SD), range
Age of subject	60.68 (10.34), 30–96
Social support of subject	5.92 (2.58), 1–10
Religious belief of subject	9.06 (1.14), 0–10
Spiritual well-being (SWB) of subject	
Total SWB	86.21 (12.46), 40–116
Quality of life (QOL) of subject	
Total QOL	98.86 (12.75), 52–124
Holistic view	3.28 (1.79), 0–10
Physical problems	23.25 (3.94), 7–34
Feeling and thought	72.32 (11.95), 34–95

Predictors for Quality of Life (QOL)

Following multivariate analyses, significant predictors of QoL were found to be the levels of educational attainment, socioeconomic status, primary source of income,

age, social support, and total spiritual well-being. QoL had a negative correlation with age (-0.2 , 95% CI -0.3 to -0.003 , $p=0.016$), but a positive relationship with both social support (0.7 , 95% CI 0.2 to 1.3 , $p=0.006$) and total spiritual well-being (0.2 , 95% CI 0.1 to 0.3 , $p<0.001$). Participants had better QoL if their main source of income came from family members or a government pension, and their education level was at least intermediate. Surprisingly, subjects with average or poor socioeconomic statuses had better QoL than those who reported being more affluent (Table 2).

Discussion

It is commonly understood that patients with heart disease have a diminished QoL. Evidence from past studies suggests that poor QoL is associated with the increased deterioration of the disease, a decline in functional mobility, poor emotional coping, undesirable treatment, and unwanted health outcomes. Given the increasing prevalence of heart disease (even in younger adult age groups), the present study aimed at determining the predictors of QoL in a sample of Iranian cardiac patients. The results of this study showed that spiritual well-being is a predictor of QoL. Likewise, Jafari et al. (2014) found a positive, significant correlation between spiritual well-being and QoL among type 2 diabetic patients (Jafari et al. 2014). Furthermore, Strada et al. (2013) and Bai et al. (2015) found that QoL could be improved through greater spiritual well-being for patients with cancer and cardiopulmonary diseases, respectively.

These results may be due to higher spiritual well-being playing an important role in a person's ability to cope with chronic illness. Spirituality is strongly associated with well-being (Braam and Koenig 2019; Sodagar and Sobhi 2019). In this regard, religiosity and spiritual well-being may be a coping mechanism and buffer psychological distress and feelings of hopelessness. Furthermore, religious and spiritual activities have been associated with improved coping mechanisms for people specifically managing stress associated with heart disease (Strada et al. 2013). Similarly, Besharat et al. (2018) showed that spiritual well-being significantly increased patients' ability to accept and manage a diagnosis of heart disease. However, Nabatian et al. (2013) did not observe the same association with veterans who were afflicted by a post-war disability. This discrepancy may relate to the source of the sample and may point to the varying mechanisms for coping between contexts and people.

The current study also found that higher educational levels were associated with greater QoL. Similarly, Mandal et al. (2016) showed that patients with coronary heart disease and higher levels of education reported better QoL. People who have achieved higher education may have greater access to health-related information, which results in better health literacy than individuals with fewer educational opportunities (Lim et al. 2016). Specifically, poor health literacy can deter patients from learning primary care skills, which can result in adverse outcomes of diseases (Macabasco-O'Connell et al. 2011). Furthermore, research has shown that increased knowledge about a disease is a determinant of a health-promoting lifestyle and

Table 2 Predictors for QOL among patients with heart diseases

	QOL Mean (SD)	Unadjusted <i>p</i> value	Adjusted <i>p</i> value
Sex			
Male	96.76 (12.31)	< 0.001	0.111
Female	100.78 (12.78)		
Marriage			
Married	99.09 (13.1)	0.417	0.180
Widowed/divorced	97.90 (10.94)		
Level of educational attainment			
No formal education	99.20 (12.73)	0.057	0.007
Primary	97.22 (11.26)		
Intermediate	101.68 (13.59)		
High school	96.34 (14.69)		
Collegiate	104.25 (8.83)		
Socioeconomic status			
Poor	96.72 (12.13)	0.014	0.020
Average	99.90 (12.71)		
Good	94.25 (15.15)		
Primary source of income			
Personal	97.11 (14.30)	0.019	< 0.001
Family	102.03 (9.06)		
Friends	89.60 (13.68)		
Pension from the government	100.45 (11.74)		
Charitable giving	98.73 (10.39)		
Death experiences			
Yes	97.17 (15.81)	0.579	0.682
No	98.92 (12.65)		
		B (95% CI)	B (95% CI)
Age	60.68 (10.34)	−0.1 (−0.2 to −0.01) <i>p</i> =0.040	−0.2 (−0.3 to −0.03) <i>p</i> =0.016
Social support	5.92 (2.58)	0.7 (0.3–1.1) <i>p</i> =0.001	0.7 (0.2–1.3) <i>p</i> =0.006
Religious belief	9.06 (1.14)	1.1 (0.4–1.9) <i>p</i> =0.005	0.7 (−0.1–1.6) <i>p</i> =0.082
Spiritual well-being	86.21 (12.46)	0.2 (0.1–0.3) <i>p</i> <0.001	0.2 (0.1–0.3) <i>p</i> <0.001

SD Standard deviation, *B* regression estimate, *CI* confidence interval

improved QoL (Rashidi and Bahrami 2015). However, the findings of the current study are in contrast to Medeiros et al. (2015), who did not find a significant association between level of education and QoL among patients with cancer diagnosis. This discrepancy may be related to the nature of the investigated diseases. Cancer

patients can be negatively affected by their illnesses in a way that indicates that level of education cannot predict their QoL.

In the current study, socioeconomic status was a predictor of QoL. Surprisingly, patients with low and middle socioeconomic status were more likely to report better QoL. This finding disagrees with Najafi et al. (2008), who found that high socioeconomic status was significantly associated with increased QoL of patients undergoing coronary artery bypass graft surgery. In addition, Medeiros et al. (2015) could not find a significant correlation between socioeconomic status and QoL among patients. These discrepancies may be attributed to the sanctions imposed on Iran by the international community, including the USA. It is possible that these sanctions have impacted the general population through escalating economic inflation, increasing the cost of commodities and energy costs, contributing to a rise in the unemployment rate, and contributing to a shortage of necessary supplies, including medicine (Kokabisaghi 2018). Therefore, higher socioeconomic status for patients may not guarantee increased accessibility to care, treatment, medications, and medical services. Subsequently, it may not improve their QoL.

In the current study, the primary source of income was found to be another predictor of QoL in cardiac patients. For instance, patients who received their main source of income from family members or a government pension reported more QoL than those that received income from elsewhere. Likewise, in a study conducted on caregivers of cancer patients, Soleimani et al. (2017a) found the primary source of income to be an important factor of QoL. Also, previous studies have indicated similar results in both cancer survivors (Fenn et al. 2014) and women undergoing joint surgery (Ackerman et al. 2005). If patients are financially supported by their family or government, they may be less worried about their healthcare and medical costs. Therefore, they may experience less anxiety and higher QoL (Lapid et al. 2016).

In the current study, age was a predictor of QoL, so a more advanced age predicted lower QoL. Likewise, Shafiei et al. (2014) reported that the QoL of patients undergoing coronary artery bypass graft surgery decreased as their ages advanced. Lim et al. (2016) also found that older Chinese patients with bladder cancer experienced lower QoL than younger patients, due to increased physical limitations and psychological problems associated with older age groups (Weber et al. 2014). In contrast, in a study by Hawkes et al. (2013) among patients with myocardial infarction (MI) in Australia, younger patients experienced lower QoL than middle-aged patients. This discrepancy may be related to the difference in instruments used for measuring QoL. In addition, Beck et al. (2001) documented that treatment differences among young and old patients with MI may justify the different results, based on their relationship between age and QoL.

In the current study, cardiac patients with higher social support had higher QoL. This differentiation is consistent with the results of Soleimani et al. (2017a), who reported a significant positive correlation between social support and QoL among cancer caregivers. Also, Eslami et al. (2015) showed that higher QoL for patients with congenital heart disease was associated with more social support. In fact, when confronted with high-stress situations (such as a diagnosis of heart disease), social support may have a stress-buffering effect (Leung et al. 2014). In addition, the social support of patients may reduce the stressful impact of their chronic illness

and facilitate greater tolerance of their symptoms (Ng et al. 2015). It has been documented that social support plays a critical role in well-being and reduces psychological distress. Patients with high levels of social support may experience less stress and cope more efficiently than patients without strong support networks (Liu et al. 2017). In addition, a lack of social support may make people more vulnerable to the stress associated with disease and illness (Howard et al. 2017).

Limitations of the Study

While this study offers preliminary insights into the importance of spiritual well-being for QoL, it is not without limitations. One limitation of the present study was the adoption of a convenience sampling procedure, which may limit the generalizability of the research findings. Moreover, the cross-sectional nature of this study limits our ability to determine the causal relationships among the constructs. This study was carried out on a completely voluntary basis, and patients were given assurances of confidentiality of information. Nevertheless, participants may not have answered in a completely non-biased manner, due to the sensitivity of their conditions. This limitation is common in self-reported questionnaires.

Recommendation for Future Studies

There is a need to replicate the present study with a larger, randomly selected sample from various cultural subpopulations, socioeconomic levels, and broader geographic areas. This endeavor will strengthen the generalizability and potential implications of the present findings. Further research needs to be undertaken to explore the QoL and spiritual well-being in individuals, in a way that is specific to their particular stage of heart disease (e.g., early onset to the end stages of the disease). Longitudinal studies are needed to capture the sequence and essence of QoL and spiritual well-being across the progression of the disease, which will identify additional variables that may be relevant. The investigation of QoL and spiritual well-being should consider the roles of nurses and other healthcare providers in the enhancement of these aspects of their patients. Lastly, future studies are needed to test the validity and efficacy of interventions designed to strengthen and maintain QoL and spiritual well-being in individuals with heart disease.

Conclusion

In general, findings showed that several factors can affect the QoL of cardiac patients. In this regard, social support and spiritual well-being were found as predictive factors of QoL in this group of patients. Therefore, considering demographic characteristics and providing a theoretical and practical approach for improving the QoL of cardiac patients (such as enhancing spiritual well-being and increasing social support from family, friends, and/or the community) are essential ways to improve

the QoL of these patients. The implications of this research have merit for health-care providers working with patients with heart disease. These results contribute to empirical evidence that demonstrates the importance of spiritual well-being and QoL in healthcare settings, and it elucidates the need to evaluate QoL in patients.

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Compliance with Ethical Standards

Conflict of interest The author declares that they have no conflict of interest.

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