



## Structural Equation Modeling of Relationships between Social Support, Self-Efficacy, and Quality of Life in Patients with Heart Failure

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### Abstract

**Background:** Heart failure, with a very high disability, leads to reduced quality of life. Variables such as self-efficacy and social support have a very much impact on the quality of life of patients. This study aimed to determine the relationship between variables self-efficacy and social support with quality of life in patients with heart failure.

**Methods:** Participants were 298 heart failure (HF) patients of Farabi hospital in Mashhad. They have completed the social support questionnaire (12 items, Zimet and et al.), Self-efficacy (10 items, Schwarzer and et al.), and the Minnesota Living with Heart Failure questionnaire MLHFQ (21 Rector).

**Results:** Confirmatory analysis method and path analysis showed that the quality of life of patients with heart failure is affected by social support and self-efficacy. Therefore, social support has a positive effect on quality of life. Self-efficacy has also been able to mediate the relationship between social support and the quality of life, as its path coefficient was equal to 0.38. Multiple indices such as RMSEA (0.078) and GFI (0.93) were used to evaluate the model. The proposed model fits the data.

**Conclusions:** It seems that social support directly and through self-efficacy can improve the quality of life of patients with heart failure.

**Keywords:** Heart failure, Quality of life, Social support, Self-efficacy.

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## Introduction

Heart failure (HF) is a major cause of hospitalization and mortality worldwide.<sup>1</sup> The prevalence of this disease in the world is spread from 2.42% in 2012 to 2.97% in 2030.<sup>2</sup> Patients admitted with the diagnosis of heart failure are 83% more likely to be hospitalized for the same disease at least once and 43% more likely to be hospitalized for the same disease at least four times.<sup>1</sup> Heart failure is a chronic medical condition that, despite medical treatments, affects various dimensions and aspects of people's lives. People with heart failure experience a variety of physical and psychological symptoms, including shortness of breath, weakness, fatigue, edema, sleep disorders, depression, and chest pain. This syndrome is involved in personal and social affairs, causing depression and anxiety<sup>3</sup> and leads to reduced quality of life.<sup>4</sup> Of course, the presence of physical signs and symptoms along with side effects caused by treatment and social restrictions created in the decline in quality of life in patients with heart failure play a significant

role.<sup>5</sup> So that among the behavioral symptoms, worries, and gastrointestinal symptoms, up to about 40% of the behavioral symptoms caused by the disease, explain the quality of life.<sup>6</sup>

Scott (2004) explains the decline in quality of life of heart failure despite the fear, anxiety, and depression caused by heart damage and the experience of waiting for death, which leads to decreased physical function and progressive symptoms.<sup>7</sup> This research shows that in addition, the formation of quality of life is based on relationships and social support and relationships of individuals with prominent features of their environment.<sup>8</sup> Social support is a strong and constant predictor of quality of life and people with social support show a higher quality of life than other people. The researches show that there are positive and significant relationships between these two components,<sup>8-11</sup> especially in patients with heart failure.<sup>12-15</sup> Social support is known to be the strongest coping force, successful and easy coping of people in times of conflict with stressful situations that facilitate the pressure of illness problems.<sup>16</sup> Research conducted so far has put great emphasis on the role of social support in health care.<sup>17-18</sup> Social support creates a feeling of caring, being loved, self-esteem, and being valued.<sup>19</sup>

The probable existence of mediating variables has always been one of the challenges facing researchers. The relationship between social support and quality of life is also known to be influenced by other variables. Some believe that the relationship between quality of life and social support can be adjusted by the self-efficacy component.<sup>20,21</sup> Self-efficacy is defined as the belief in the ability to work.<sup>22</sup> Investigating the mediating role of self-efficacy in the relationship between quality of life and social support due to numerous studies that have shown; Self-efficacy is important on the one hand related to the quality of life<sup>23-25</sup> and on the other hand to health<sup>26</sup> and social support<sup>27-28</sup> in patients with heart failure. On the other hand, some studies have shown that self-efficacy and social support are affected by the quality of life.<sup>29</sup> Therefore, the main aim of the study is to examine the effect of social support on quality of life with the mediating role of self-efficacy.

## Materials and Methods

The present descriptive, cross-sectional, and correlational research has been done by the structural equation method. The article is taken from the dissertation with the approval of the code of ethics IR.IAU.MSHD.REC.1397.042 from Mashhad University of Medical Sciences. In the first quarter of 1398, 298 HF patients of Farabi hospital in Mashhad were selected as participants as available. The input components of the sample

were as follows. Being in the age range of 50 to 65 years, at least five years of infection and living in the cities of Mashhad, which was applied as a control variable in the sample selection. Gender was also a control variable in the present study. After receiving written consent, the questionnaires were completed by the participants. The instruments of the present study included a quality of life questionnaire for patients with heart failure, a social support questionnaire, and a self-efficacy scale.

Minnesota living with heart failure questionnaire (MLHFQ): Developed by Rector (1984) to assess the quality of life of heart failure patients. This questionnaire has 3 subscales \21 items.<sup>30</sup> The method of scoring and interpreting the questionnaire is based on the Likert scale from zero to five. The number zero indicates the best case and the number five indicates the worst case. The score range of this questionnaire was between 0 and 105. According to Bohlooli study in 2009, the cutting points of the quality of life questionnaire were determined as a score less than 24 (good quality of life), a score of 24 to 45 (average quality of life) and a score higher than 45 (poor quality of life).<sup>31</sup> In Kobo study (2004), there was a significant relationship between MLHFQ scores and disease severity (NYHA). So that the average scores of patients in classes one, two, three, and four were 21, 37, 53, and 69, respectively.<sup>32</sup> This questionnaire has high validity and reliability compared to other existing questionnaires. In Abbasi study, the reliability of this tool has been reported 0.94.<sup>33</sup>

Multidimensional scale of perceived social support: This tool has been prepared by Zimet et al. (1988). The scale has twelve test items and three subscales. It measures perceived support from family resources (phrases 3,4,8,11), friends (6,7,9,12) and important people (phrases 1,2,5,10). A high score on this scale indicates a high level of social support.<sup>34</sup> The study of Fisher and et al. (2006) had a good internal consistency and the alpha coefficient of the whole test was equal to 91% and the alpha coefficient of its subscales was in the range of 90% to 95%.<sup>35</sup> In the study of Mohajerani et al (2017), the internal reliability of the perceived social support scale was calculated to be 0.87 using Cronbach's alpha method. The calculated reliabilities for the subscales of social support perceived by friends, family and other important people in life were 0.81, 0.85 and 0.83, respectively.<sup>36</sup>

General self-efficacy scale (GSE): This questionnaire was made by Schwarzer and Jerusalem (1984). It has ten positive items, each item containing four answers. The scoring method

with a four-point Likert scale from the option is not correct at all until the option is completely correct. Scoring is done with values from one to four, respectively. A person's self-efficacy score ranges from ten to forty. Schwarzer and et al. obtained the internal consistency coefficient of general self-efficacy scale editions for students in Germany at 0.84, in Costa Rica and Spain at 0.81, and in China at 0.91.<sup>37</sup> In Iran, Delavar and et al. (2013) reported that the scale reliability was 0.87 for all subjects, 0.85 for men and 0.8 for women.<sup>38</sup> Also in the study of Shams and et al. (2011), Cronbach's alpha of the questionnaire was reported between 0.81 to 0.91% and its internal consistency coefficient was between 0.81 to 0.91%.<sup>39</sup> The hypothesis and research model were investigated by the path analysis method and using Lizrel software.

### Results

The mean age was 58.32, the standard deviation was 23.5%, 58.7% of the sample were married and 20.1% were single. 68.8% had a history of other diseases and 31.2% had no other chronic diseases. All participants were male due to gender variable control. Structural equation model analysis was used to test the research hypotheses. Therefore, the conceptual model of the research was tested in the form of a proposed model using the collected data. First, the normality of the data is examined. Table 1 describes the descriptive indicators of the research. Table 1 presents the descriptive indices of the variables including mean, standard deviation, skewness, and kurtosis.

**Table1. Descriptive indicators of research variables**

Variable	Average	Standard deviation	Skewness	Kurtosis
Social support	35.37	24.77	0.39	-1.6
Efficacy	20.08	9.54	0.37	-1.52
Quality of life	64.43	31.37	-0.26	-1.64

Table 2 shows the relationship between the variables. The correlation coefficients of social support with quality of life are 0.408, self-efficacy with quality of life is 0.445, and with social support is 0.445, which is significant at the level of 0.01.

**Table 2. Correlation matrix of research variables**

Variable	Quality of life	Social support	General self-efficacy
Quality of life	1		
social support	0.408**	1	
General self-efficacy	0.445**	0.445**	1

As shown in table 3, indices were fitted. All indices utility good overall fit. The validity of the model was generally confirmed. According to the table of model fit indices, in the next part, the hypotheses are experimented and examined.

**Table 3. Fit indicators**

Row	Title of exam	Description	Acceptable values	The value obtained
1	X <sup>2</sup> /df	Relative chi -square	<3	2.53
2	RMSEA	The root of the mean power of the approximation error	<0.1	0.09
3	GFI	Goodness of fit index	>0.9	0.93
4	RMR	The root Mean square residual	<0.1	0.07
5	NFI	Normed Fit index	>0.9	0.92
6	CFI	Comparative fit index	>0.9	0.94

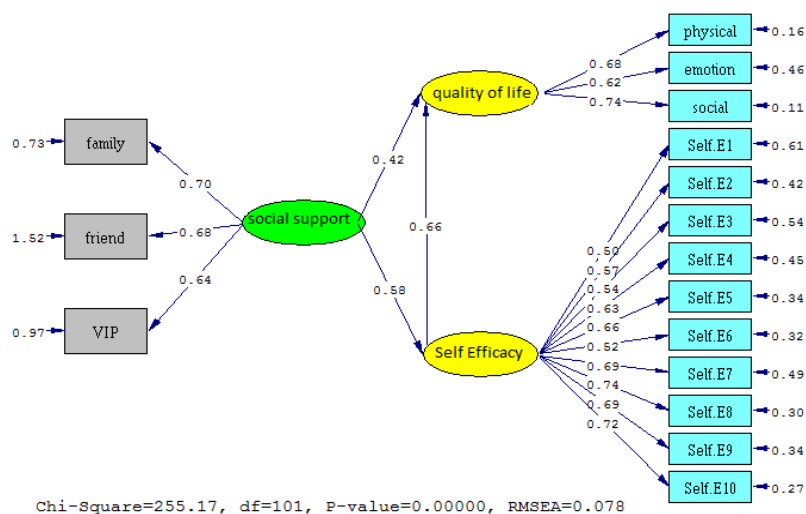


Figure 1. Factor coefficients and path coefficient of research model

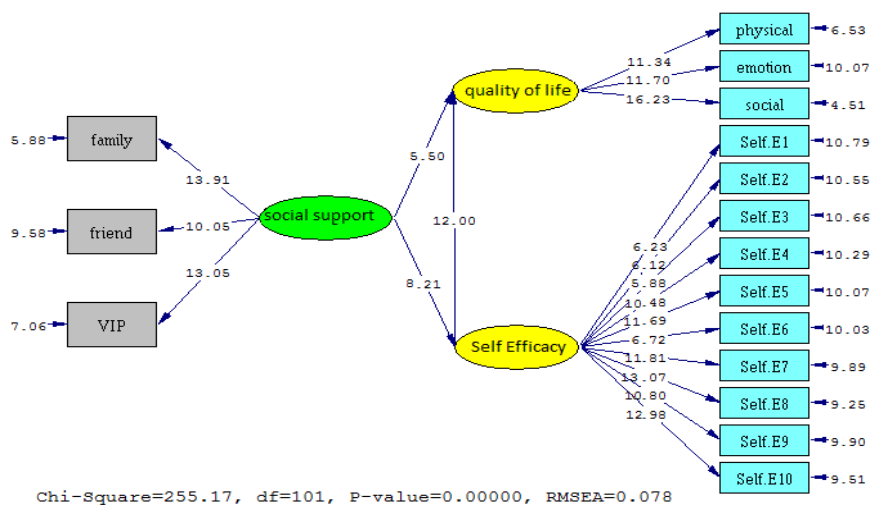


Figure 2. Model t test results

The impact of the significance of each of the independent variables on the dependent variables using statistics T is specified. If the value of this statistic becomes more than 1.96 or less than -1.96, the hypothesis is approved. According to table 4, it can be said that the result obtained from testing the hypothesis with respect to the coefficient of Route 0.58 and value t Equal to 8.21 show the perceived social support has the impact of the positive and statistically significant on the quality

of life there. The test hypothesis is also the factor of Route 0.66 and value t Equal to 12, the result obtained was that the self-efficacy of the positive and statistically significant on the quality of life. The results obtained from testing the hypothesis with a coefficient of Route 0.42 and value t Equal to 5.50, proof of this is that support social perception on the quality of life impact of the positive and the means to do it.

Table 4. Standard correlation coefficients of variables using structural equation regression model

7	Path coefficient	T statistics	Standard error (SE)	Result
Perceived social support for self-efficacy	0.58	8.21	0.071	Reception
Self-efficacy on quality of life	0.66	12	0.055	Reception
Perceived social support for quality of life	0.42	5.50	0.076	Reception

The significant relationships between components show that self-efficacy mediates the relationship between perceived social support and the quality of life.

So that its path coefficient is equal to  $0.58 \times 0.66 = 0.38$ , Zabel test was also used to make the effect of the mediator variable significant, which resulted in approved the hypothesis.

## Discussion

According to the findings, the quality of life of patients with heart failure has a direct relationship with social support through self-efficacy. The results indicate the fact that increasing the quality of life of patients with heart failure can be associated with a person's perception of social support through increased self-efficacy. The structural model examines the mediating role of self-efficacy in the relationship between social support and quality of life, the impact of social support and its items on quality of life is in line with some previous studies and indicates the fact that social support can improve the quality of life. Therefore, to improve the quality of life, attention should be paid to social support as well as self-efficacy. In the conclusion of this study, it can be said that social support and self-efficacy can, directly and indirectly, predict the quality of life. The findings of other researchers, which are consistent with the results of this study, indicate the impact of the quality of life through social support with the mediating role of self-efficacy.<sup>16</sup>

Numerous studies<sup>3,4,40-42</sup> have shown the poor quality of life in patients with heart failure. Other studies, which reported a better quality of life, had better social support.<sup>4</sup> In addition to demographic components such as level of education, duration of illness, marital status,<sup>43</sup> age, exercise, lack of abdominal obesity, a physical activity more than five sessions per week, non-smoking and low saturated fat intake,<sup>44</sup> source of information (television), management and reduction of drug use,<sup>45</sup> numerous socio-economic, spiritual and psychological components are involved in improving the quality of life of heart failure patients. The decrease in the quality of life of patients in adulthood and fertility, in which the individual has the greatest responsibility to the family and society,<sup>46</sup> increases the need for social support. Optimal social support can increase self-care<sup>47</sup> and lead to a better quality of life through improved self-efficacy,<sup>48</sup> which is considered an important predictor of behavior.<sup>4</sup> Improving communication skills is positively related to self-efficacy.<sup>49</sup> Therefore, increasing support in social, economic, psychological-emotional dimensions, and especially information (education)<sup>42,50</sup> can improve the quality of life and enhance the lifestyle by increasing self-efficacy<sup>51</sup> in patients with heart failure.<sup>52</sup>

High self-efficacy in cross-sectional and longitudinal studies is associated with improved physical function, reduced readmission, mediated role in reducing depression, and reduced mortality in patients with heart failure.<sup>22</sup> In addition to creating a sense of satisfaction and a better understanding of psychological characteristics, managing negative emotions and the ability to do homework and personal health, it enables easy communication with others<sup>19</sup> and helps to receive social support by internal locus of control.<sup>16</sup>

Graven et al.'s (2017) study refers to the role of social support in increasing self-care and self-efficacy in patients with heart failure.<sup>53</sup> Social support explains changes in various characteristics (such as BMI and depression) and related to quality of life.<sup>54</sup> The relationship between social support and quality of life is made possible through self-efficacy, which Bandura sees as a key precondition for behavior change.<sup>55</sup> Finally, it is suggested to pay attention to education with different methods such as training of group and individual peers to improve the quality of life of patients and according to the findings of other research,<sup>42,50</sup> further studies are recommended to investigate the effect of presenting informational support (educational content) on the quality of life.

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## Conflict of Interest

The authors declare that they have no conflict of interest.

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