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Quality of life in heart patients in Iran: A systematic review and meta-analysis method

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ABSTRACT

It is predicted that approximately 25 million deaths will occur due to cardiovascular disease per year 2010. Since this disease affects people's quality of life, The purpose of this study is to investigate the quality of life of cardiac patients in Iran using Meta-Analysis method. The search was done using keywords of Quality of Life, Cardiac, Iran in the foreign databases of Pub, Scopus, med, ISI, Google Scholar and native databases such as Sid, Medlib, Iran medex, Magiran. The data was analyzed using Meta-Analysis (Random Effects Model). The heterogeneity of the studies was investigated using the I^2 index. Data was analyzed using STATA Ver.11 software. SF-36 questionnaires were used in the investigated studies. Among the 13 attempted studies with the sample size of 1581 people done through 2003 to 2015, the average quality of life of cardiac patients was 42.09 (Confidence interval 95%: 19.90 to 64.29). the mean score of quality of life of heart patients is 45/64 from social dimension, 43/46 from physical dimension, 48/24 from mental dimension, and 51/54 from vitality dimension. Also, the prevalence of excellent, fair and bad quality of life among the cardiac patients was 28%, 52%, and 22%. The quality of life of cardiac patients is moderate.

Keywords: Quality of Life, Cardiac and Iran.

INTRODUCTION

Quality of life is defined as person's mental attitude toward the cultural, social and economic environment in which they live in and is not easily described. Quality of life owns six domains of physical, psychological, level of independence, social relations, environmental and spiritual dimensions[1]. Investigating The Quality of life in patients with heart failure, aims at adoption of necessary measures for the implementation of nursing care, reduction of depression, increase of activity levels, promoting awareness and knowledge and improvement of Self-care skills in patient and ultimately amending the quality of life[2]. The duration and severity of chronic diseases such as cardiovascular problems in which the quality of life of patients undergoes significant changes[3].

Heart failure is one of the most common diseases that is still one of the major problems in the healthcare system despite medical advances [4]. One of the most common chronic disorders is cardiovascular disease. Coronary artery disease, is one of the leading cause of death in most industrialized countries that leads to significant disability and also reduced labor productivity [5]. Cardiovascular disease is the first reason of mortality and morbidity in Iran and heart surgery is performed in nearly 60 percent of surgeries in the country [3]. Predictions show that due to the

presence of multiple cardiovascular risk factors, nearly twenty-five million deaths a year will occur from cardiovascular disorders in 2020 and the disease is considered as the first deadly and debilitating injury among diseases[6]. Heart attack is one of the most common coronary artery diseases. Besides being the first cause of death in patients older than 35 years, age of prevalence is declining [5]. A third of deaths are due to coronary artery disease in the world. Although the most deaths statistics in early twentieth century were related to developed countries, its incidence is rapidly increasing in developing countries, So that 78% of deaths due to coronary artery disease in recent years is associated to these countries. [7]. Primarily in patients with chronic problems such as coronary artery lesions, absolute cure of disease is not considered as a realistic and achievable goal, Because the disease is progressive, debilitating and multiple internal and external factors are effective on to its intensification and improvement[8].

Martensson et al also suggested that the primary source of depression and undesirable quality of life in these patients are related to the physical symptoms of the disease [9]. The rise in heart failure resulting from complications of infectious, inflammatory, vascular and valvular diseases of heart is accounted as a major health problem and An epidemic illness in the United States. it is expected that available statistics will be doubled in the next 30 years [10]. According to the Heart Association of America, nearly 1.5 million of heart attacks occur each year in America and a third of these people die before reaching the hospital [11]. In Iran, according to the Center of Disease Control statistics released in 2001, the number of patients with heart failure which have been reported in 18 provinces is 3337 per group of 100,000 people. During a survey in September of 1998 in Iran, 25% of patients hospitalized in heart ward suffered from heart failure [10]. Based on studies conducted in the US the number of coronary artery bypass surgery increased from 150,000 in 1979 to more than 500,000 in 1995, respectively. In Iran, 60 percent of all cardiovascular surgery is related to coronary artery bypass surgery [12]. According to the World Health Organization in March 2002, cardiovascular disease has been the cause for 22 percent of deaths in the world and 35 percent of deaths in Iran [13]. Several studies in different regions of Iran have been done to assess the quality of life in Patients with Heart Disease But still an overall assessment of their life quality status in Iran has not been conducted.

The condition of life quality in heart patients in Iran is not clear from 2001 to 2015. This study aims to evaluate the quality of life for patients with heart disease in Iran using systematic reviews and meta-analysis. This study outlines systematic review of previous studies at first and then a meta-analysis of the final data is performed.

MATERIALS AND METHODS

Search strategy:

This is a meta-analysis study that considers the quality of life of heart patients in Iran. The reviewed documents were searched from internet and manual search in the library of Tehran University of Medical Sciences. Databases including Iranmedex, SID, Magiran, Irandoc, Medlib, IranPsych, Science Direct, ISI, PubMed, and Scopus were searched using Internet. The search was limited to 14 recent years updated to 2015 and involved theses, national and international scientific journals, papers presented at congresses and organizational reports.

To gain high sensitivity, the search inside the country was conducted only through keywords of quality of life, Heart and Iran because some sites did not show sensitivity to the search operators (OR, AND, NOT). However, international databases were searched through the keywords of ("Quality of Life", "Heart" and "Iran"). The keywords were standard in MeSH and eventually (Iran AND Heart) strategy was used to search. In addition, reference lists of selected articles were evaluated for finding relevant studies.

Study Selection:

First, a list of titles and abstracts of all searched papers in national databases was prepared by two researchers independently. Then, articles with repetitive titles were excluded. Next, articles' abstracts were reviewed for finding appropriate studies. Study selection in international databases was similar to the that of national databases, except that all search studies were saved in EndNotex6 software and the rest of the process was done by the software.

Study inclusion criteria were: (1) All descriptive studies (2) Referring to the quality of life in patients with Heart (3) Studies conducted in the last 14 years. It should be noted that the minimum entry criteria were used to increase the sensitivity of article selection. But to find the most relevant and highest quality studies, exclusion criteria were as follows: (1) Non-related studies in terms of study method and research topic. (2) Studies which did not have enough information. The low quality of studies was assessed through the STROBE checklist (Strengthening the reporting of observational studies in epidemiology)(14). The quality of studies was evaluated using the STROBE checklist. The checklist has 22 sections that cover different parts of a report. Each section was given one point and higher points were given to other sections that we considered more important.

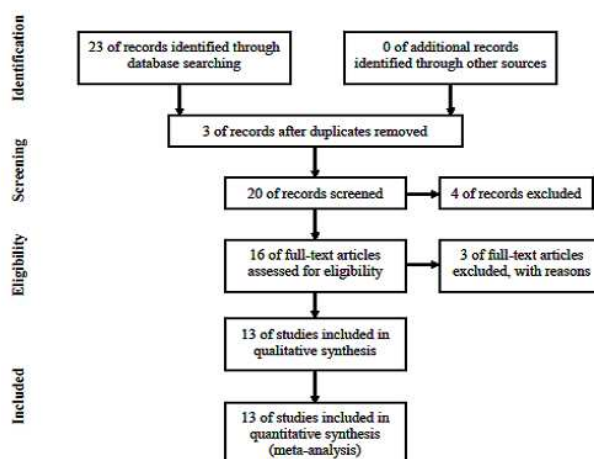
Data Extraction:

To reduce bias in reporting and error in data collection, two researchers independently extracted data using a standardized data collection form that was already prepared. The form was first designed by the study team and included the following items: The author's name, title of study, year of publication, journal name, study design, inclusion and exclusion criteria, sample size, etc.

The questionnaire used in this study is SF-36. Questionnaire of the quality of life is in the Short Form consisting of 36 questions (SF-36) and it owns eight aspects in which its validity and reliability were tested by Dr. vaar. The questionnaire has been used in the country, and the validity and reliability of it have been approved. eight aspects of the questionnaire consist of status of general health, physical functioning, limitations of role playing due to emotional reasons, social performance, vitality and energy, pain, mental health of individuals and constraints of role playing because of physical causes .it includes 36 questions and the Scoring is done by the 5-point Likert method(6). QIMI and Mac New questionnaires were used in two other studies.

RESULTS**Summary of How to enter articles to the meta-analysis**

In the first phase of the search, 23 articles were selected .after reviewing articles, 20 of them were identified and included in the second phase of the evaluation of abstracts. Finally, 13 appropriate articles were selected to enter the meta-analysis stage (Figure 1).



An Investigation in 13 articles with a sample of 1581 people was carried out during the years 2002 to 2015. quality of life in heart patients has been reported in 8 Articles that Average grade of life quality was Estimated 59.20 (Confidence interval of 95% : 37.57-80.82).By eliminating research of Mohammadi, as the related data to his study is Outlier, quality of life of cardiac patients was calculated again and a result of 42.09 was gained(Confidence interval of 95%: 19.90-64.29). In this study, the lowest and highest score in quality of life for heart patients were in the study Yalfani and colleagues (4.44) and study of Mohammadi et al (183.44) respectively. With the removal of Mohammadi's study, Tehrani and colleagues research (55.70) was replaced and was reported as the highest score for the life quality of heart patients in Iran. Due to the heterogeneity of the studies, the confidence interval for each study was considered and the intended interval for each study based on random-effects model is shown in Figure 1.

Table1:studies for meta analysis general characteristics of selected

| Number | author | Questionnaire | Year | City | Statistical Society | Sample | Good quality of life% |
|--------|----------------|---------------|------|-------------|---|--------|-----------------------|
| (15) | Borhani | Sf-36 | 1389 | Kerman | Heart failure patients | 90 | --- |
| (6) | Babae | Sf-36 | 1390 | Tehran | Coronary artery disease | 80 | --- |
| (7) | Yalfani | QIMI | 1390 | Hamedan | cardiovascular patients | 60 | 9.16 |
| (3) | Tehrani | Sf-36 | 1390 | Tehran | Coronary artery disease | 160 | --- |
| (2) | Yusefi | Sf-36 | 1390 | Kerman | Heart failure patients | 200 | --- |
| (16) | Montazer ghaem | Sf-36 | 1388 | Bandar abas | Cardiac surgery patients | 100 | --- |
| (5) | Mohamadi | Mak niu | 1385 | Tehran | Myocardial infarction patients | 38 | --- |
| (17) | Esmaili | Sf-36 | 1383 | Sari | Cardiovascular surgery | 172 | 9.48 |
| (8) | Ahmadi | Sf-36 | 1381 | Tehran | Coronary artery disease | 80 | --- |
| (11) | Dehkordi | Sf-36 | 1384 | Shahrkord | Myocardial infarction patients | 150 | 7.20 |
| (4) | Dehdari | Sf-36 | 1386 | Tehran | Patients with coronary artery bypass | 110 | --- |
| (10) | Shojaei | Sf-36 | 1387 | Tehran | Heart failure patients | 250 | 6.23 |
| (18) | Behroozi far | Sf-36 | 1384 | Mashhad | Coronary Artery Bypass Surgery Patients | 91 | --- |

The quality of life of cardiac patients in Iran was different in many aspects. As the average score of life quality of cardiac patients was 45.64 (16.32-74.97) of the social dimension and 43.46(17.40-69.52) of the physical dimension ,48.24(18.06-78.41)of the mental health and 51.54 (37.27-65.81) from the dimension of the vitality (Table 2).

Table 2 . : the average score for quality of life in heart patients in studied sub-groups in Iran

| sub groups | Number of studies | Sample size | Average of the life quality in heart patients (Confidence interval of 95%) | The highest mean score of life quality in heart patients (Confidence interval of 95%) | The lowest average score of life quality in heart patients (Confidence interval of 95%) |
|---|-------------------|-------------|--|---|---|
| average score of life quality in heart patients | 8 | 661 | 42/09(19/90 - 64/29) | 55/70(53/16 - 58/24) | 4/44(4/29 - 4/59) |
| average score of life quality in heart patients from social dimension | 6 | 740 | 45/64(16/32 - 74/97) | 78/00(73/69 - 82/31) | 2(1/93 - 2/07) |
| average score of life quality in heart patients from physical dimension | 6 | 740 | 43/46(17/40 - 69/52) | 60/15(57/12 - 63/18) | 2/39(2/24 - 2/54) |
| average score of life quality in heart patients from mental dimension | 6 | 740 | 48/24(18/06 - 78/41) | 82/15(78/08 - 85/92) | 2/55(2/40 - 2/69) |
| average score of life quality in heart patients from vitality dimension | 3 | 740 | 51/54(37/27 - 65/81) | 59/15(54/69 - 63/31) | 37/62(34/29 - 40/95) |

Good quality of life in heart patients was 28% (Confidence interval of 95%: 13% to 43%), fairly good 52% (Confidence interval of 95%: 40% to 64%) and poor (22%) (Confidence interval of 95%: 6% to 37%) (Table 3).

Table 3 .Quality of life in heart patients in the groups studied in Iran

| sub groups | Number of studies | Sample size | The quality of life status of heart patients (Confidence interval of 95%) | The best status of life quality in heart patients(Confidence interval of 95%) | The worst status of life quality in heart patients(Confidence interval of 95%) |
|---|-------------------|-------------|---|---|--|
| Good quality of life in heart patients | 4 | 632 | 28(13 - 43) | 49(38 - 60) | 17(03 - 31) |
| Relatively good quality of life in heart patients | 4 | 632 | 52(40 - 64) | 66(59 - 73) | 43(31 - 54) |
| Poor quality of life in heart patients | 4 | 632 | 22(6-37) | 41(29 - 53) | 8(-7 - 22) |

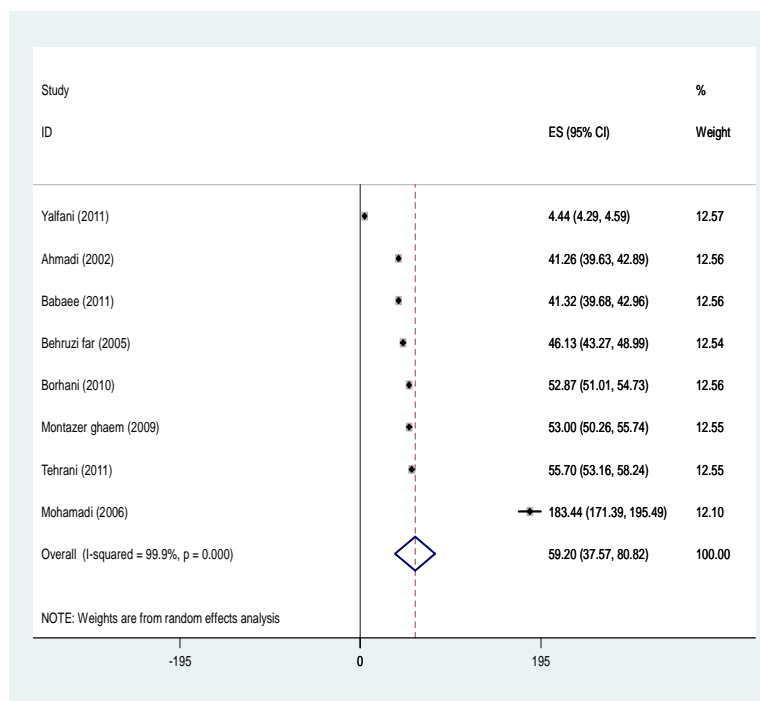


Figure 1. Average total score of quality of life in heart patients and Confidence interval of 95% in Iran, according to the author's name and year of the study, based on a random effects model. The midpoint of each segment shows the score of quality of life in heart patients in each study. rhomboid shape demonstrates the score of the quality of life for heart patients in Iran for the For the entire studies

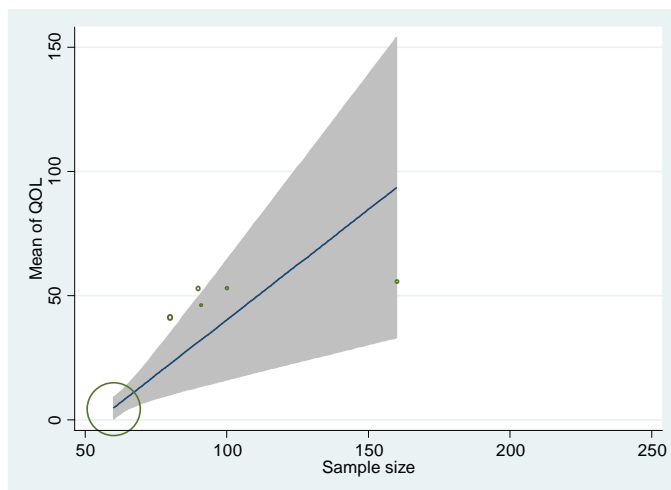


Figure 2. Relationship between quality of life for heart patients and the sample size in research using meta-regression. The size of the circle indicates a large number of samples. According to the diagram ,there is no significant relationship between the quality of life of heart patients in Iran and the sample size of the study ($P = 0.103$), which means quality of life for heart patients in Iran does not increase by increasing the number of samples in research

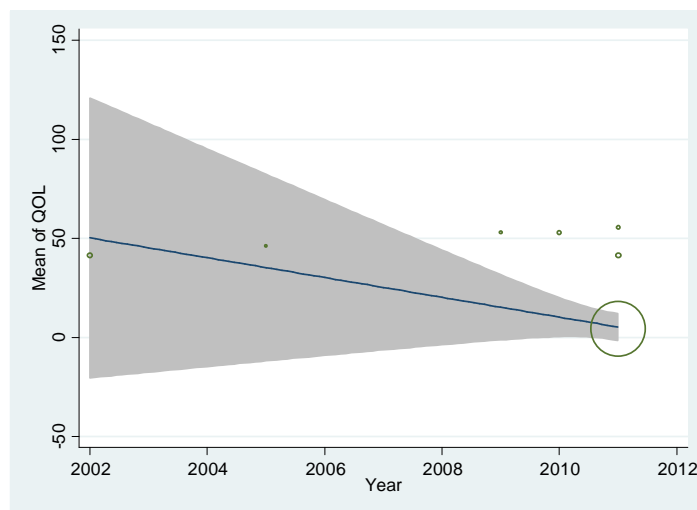


Figure 3. Relationship between quality of life of heart patients and the year of research using meta-regression. (According to the diagram there is no significant relationship between the quality of life of heart patients in Iran and the year of researches ($P = 0.778$). This means that the quality of life for heart patients in Iran has not been diminished during 2002 to 2012 in this study

quality of life in cardiac patients of northern parts was 46.3(Confidence interval of 95% : 38.26-53.80), in southern regions: 53.00(Confidence interval of 95% : 38.26-53.80) ,in the center of Iran : 52.87 (Confidence interval of 95% : 51.01-54.73) ,in the West : 4.44 (Confidence interval of 95% : 4.29-4.59) and in the East of Iran was 46.13 (Confidence interval of 95% :43.27-48.99), respectively.

In the analysis that was done by separate questionnaire, the average score of the quality of life in cardiac patients in Iran according to sf-36 was 48.34 (Confidence interval of 95%: 43.03-53.65), but there was only one study was available from each questionnaire of QIMI and New Mac. In the analysis that was done by the type of heart disease in subjects, the average grade of the quality of life in patients with coronary artery disease in four studies was 46.06 (Confidence interval of 95%: 39.97-52.11) and there was only one study available about other diseases.

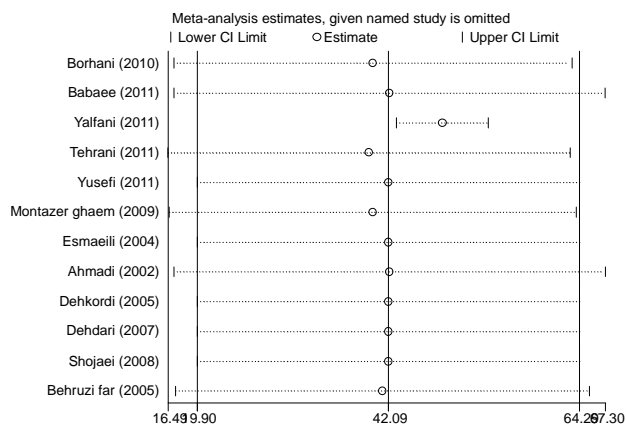


Figure 4. Sensitivity analysis (Circles represent relative risk (RR) by eliminating the study and segments show confidence intervals of 95% for RR). This diagram demonstrates the effect of the removal of any study on the final outcome of this research. According to the above diagram, quality of life of the heart patients in Iran increases to 48% (95% CI: 43% to 53%) by eliminating Yalfani study in 2011. Quality of life of the Iranian heart patients is reduced to 39% by removing the study of Tehrani in 2011 (95% CI: 16% to 63%). So, these two studies are most effective ones in the final result of this research

DISCUSSION

In 13 articles under investigation with a sample of 1581 people carried out during the years 2002 to 2015, the average score of life quality was stated in 8 Articles. The quality of life in heart patients was estimated to be 59.20 (Confidence interval of 95%: 37.57 – 80.82).

By eliminating the study of Mohammadi which is considered to be outliers, the average score for the quality of life of cardiac patients was calculated again and the result of 42.09 was obtained (Confidence interval of 95%: 19.90 – 64.29). In this study, the lowest and highest score in quality of life for heart patients in the research of Yalfani and colleagues and study of Tehrani et al. were 4.44 and 55.70 respectively. In some studies quality of life for heart patients were expressed in percentage terms, so that good quality of life in heart patients was stated 28% (Confidence interval of 95%: 13% – 43%). Relatively good: 52% (Confidence interval of 95%: 40% – 64%). and poor 22% (Confidence interval of 95%: 6% – 37%). These studies showed that heart patients enjoy relatively good quality of life.

The quality of life of cardiac patients in Iran was different in many aspects. As the quality of life of cardiac patients from the point of the social dimension was 45.64, from physical dimension was 43.46 and from the aspects of mental health and vitality were 48.24 and 51.54 respectively. The lowest and highest mean score of quality of life were related to health and vitality of the patients with heart disease.

The Quality of life for heart patients was different in different parts of Iran. As the quality of life of cardiac patients in northern parts was 46.03, in southern regions was 53.00 and 52.87 in central parts of Iran and in eastern and western parts were 4.44 and 46.13 respectively. The lowest and highest average score of quality of life for heart patients were related to the West and South of Iran respectively. However, since the distribution of studies is not uniform in the country, precise reasoning cannot be performed.

In the analysis which was done by separate questionnaires, average score for quality of life of cardiac patients in Iran by questionnaire sf-36 was 48.34, but there was only one study available from each questionnaire of Mac New and QIMI. In another analysis that was done according to the type of heart disease in subjects, the average score of quality of life in patients with coronary artery disease was 46.06 in four studies, and there was only one study available of other diseases.

In the study of Najmzadeh in 2006 in Tehran 52.4% of patients after coronary artery bypass surgery in Tehran are satisfied with their health status (16). Babaei conducted a research in 2005 in Tehran and reported improved quality of life in patients after coronary artery bypass surgery and stated that in case of provision of educational program to patients and follow-up after surgery the quality of life for patients can be enhanced (16). The study of Ismaili et al in 2007 represented that 75 percent of patients described their quality of life to be pleasing three months after open heart surgery. However, in some studies on quality of life in patients after heart surgery and was described to be adverse (17). Due to the difference in the score of quality of life for heart patients in different studies, meta-analysis method was applied.

It was found in the research conducted by Riedinger et al. that women with heart failure compared to women with other chronic diseases have lower quality of life (19). Johansson et al during the study revealed that patients with heart failure compared to patients with other chronic diseases such as chronic obstructive pulmonary disease, arthritis, and unstable angina benefit from lower quality of life (20). Arnold and colleagues wrote in this regard and claimed that Heart failure is a progressive and chronic disease that The symptoms of the disease and its complications over time cause limitations in the normal life of the patients And affects their quality of life (21). Jaarsma et al in the study concluded that the comorbidity of heart failure and other chronic diseases results in more adverse quality of life (22)

A couple of limitations of this study are as noted: 1) lack of access to full-text articles 2) Some studies mentioned prevalence of quality of life while some others stated the average score of quality of life in patients with heart disease.

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