

# Health-Related Quality of Life after Valve Replacement Surgery

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## ABSTRACT

**Background:** Heart valve disease gradually increases the pressure in the heart chambers and impairs heart pumping. It influences on quality of life due to low output, disability, fear, amnesia, anxiety, and depression. Although most of signs and symptoms in patients with heart valve diseases may significantly decrease after valve replacement surgery, there is limited information about the impact of surgery on patients' quality of life. Therefore, we aimed to compare the scores of health-related quality of life (HRQoL) before and after the surgery in patients undergoing valve replacement surgery in Shahid Rajaei Heart Center, Tehran, Iran.

**Methods:** In this descriptive cross-sectional study, 102 patients who underwent for valve replacement surgery including mitral valve, tricuspid valve, aortic valve, pulmonary valve or combinations of two or more of these valves were selected through convenience sampling method. The MacNew HRQoL questionnaire was used to collect data in this study. Subjects completed the questionnaire in two stages, before and 2 months after surgery. Collected data were analyzed using SPSS version 18.

**Results:** The majority of subjects were female (60.8%) and married (89.2%). Mitral valve disease (52%) and tricuspid valves abnormality (1%) were the most and the least common valve diseases among subjects, respectively. The results indicated an increase in the HRQoL score after valve replacement ( $p < 0.001$ ). The results also showed that there is no significant relation between the HRQoL scores with gender, education level, type of valve dysfunction and income.

**Conclusion:** Overall HRQoL scores in patients with valve diseases improve significantly after surgery. Therefore, surgery not only is recommended to relieve the symptoms of patients, but also can be considered as an effective strategy to improve the quality of life in patients with valve diseases.

## Keywords:

Health-related quality of life, Valve replacement, Mac New questionnaire

## 1. Background

In recent years, valve replacement surgery has crucially increased to correct and repair valves' performance (Roberts & Ko 2005). A range of various factors including congenital heart defects, rheumatic fever, bacterial infection and aging process can cause heart valve diseases and develop valve dysfunction (Dunderdale et al. 2005). Aortic and mitral valve diseases are more common heart valves diseases. In addition, pulmonary valve usually develop due

to congenital defects. Heart valves diseases can lead to heart failure because heart is not able to compensate the effects of valve disease on heart chambers. The effects of heart valve disease may irreversibly damage myocardium.

There are some typical signs and symptoms in patients with valve diseases. These signs and symptoms are shortness of breath, dizziness, pectoris angina and generalized edema. In some cases, these symptoms can lead to intolerance of the activity in patients with heart valve diseases. Although some patients with mild degree of heart

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valve disease may have a normal life, activity intolerance would develop in patients with heart valve diseases when the problem becomes worsen. Therefore, patients with heart valve diseases will lose their normal daily living activities and independency. They would become more dependent to others in order to do their own daily living activities. These patients usually need to have surgery to replace heart valve with an artificial valve (Roberts & Ko 2005).

There is no doubt that the signs and symptoms of heart valve diseases and its management interventions have a major impact on patients' daily living activities and may diminish the quality of life. Heart valve diseases can reduce life satisfaction, social isolation and depression due to decreased quality of life (Dunderdale et al. 2005). In fact, the primary source of depression and poor quality of life in these patients is due to the presence of multiple physical symptoms which are developed because of heart valve disease (Mårtensson et al. 2003). In addition, anxiety, fear and mood disorders in these patients will ultimately lead to poor sleep that affects their quality of life (Dunderdale et al. 2005).

There are many definitions of health-related quality of life (HRQoL). The HRQoL means physical, psychological and social interest that is affected by the actions, beliefs, expectations, and personal receive. In a more comprehensive definition of HRQoL is stated that it is a part of the general attitude that includes emotional, social, and physical aspects of an individual's life according to his/her particular circumstances. The World Health Organization (WHO) considered the quality of life for physical health, psychological health, social relations and environmental conditions (Babaei et al. 2012; Douki et al. 2011; Marwick et al. 1999).

The study of Jensen et al. showed an increase in the quality of life in patients with cardiac valve diseases after valve replacement surgery (Jensen et al. 2006). Although several studies have been conducted to assess the improvement of quality of life after valve replacement surgery in patients with cardiac valve diseases, the HRQoL in patients undergoing valve replacement surgery has not been the interest of researchers in Iran. It can be arguable whether cardiac valve replacement surgery can improve the quality of life in patients with cardiac valve diseases. Due to high costs and complications of valve replacement surgery, it is crucial to understand how much the quality of life can be improved after valve replacement surgery to justify the indication of surgery instead of medical management for patients with moderate cardiac valve diseases. Therefore, this study aimed to compare

the scores of HRQoL before and after valve replacement surgery in patients with heart valves diseases.

## 2. Materials & Methods

This descriptive cross-sectional study was conducted at Shahid Rajaei Heart Center, Tehran, Iran. An ethical approval was obtained from the Ethical Committee of Iran University of Medical Sciences, Tehran, Iran. From April 2013 to July 2013, 102 patients with valve replacement surgery including mitral valve, tricuspid valve, aortic valve, pulmonary valve, or a combination of these valves were selected based on inclusion and exclusion criteria through a convenience sampling method.

Patients with re-do valve replacement surgery, pulmonary artery pressure greater than 50 mm Hg, age below 18 years old and severe right ventricular dysfunction were excluded in this study. Subjects were signed an informed consent form before collection data and completed MacNew HRQoL questionnaire before going to valve replacement surgery. In patients who were not able to read, the researcher read the questions for subjects and completed the questionnaire. Subjects were also asked to fill out MacNew HRQoL questionnaire two months after their surgery. The MacNew HRQoL contains three dimensions including physical health status, emotional health status and social health status. The questionnaire consists of 26 questions.

Each question is given a score between 1 and 7. Questions 1, 2, 3, 4, 5, 6, 7, 10, 11, 13, 15, 18, 22 and 23 assess the emotional status which measures the state of tiredness and lethargy, feeling of confident to cope with illness, feelings of despair and depression, feeling of useless and incapable of being, loss of self-esteem, feelings of grief and crying, feeling of being relaxed, feeling of impatience and anger, feeling of happiness and satisfaction with life, feeling of the burden to others, feeling of dependence on others, lack of trust in others and a sense of receiving attention from family members. Questions 8, 19, 16, 9, 17, 26, 20 and 21 evaluate the physical status which measures dizziness, confusion, fatigue, pain in the legs, short of breath during physical activities, restlessness, perceived limitations in some physical activity, sense of limitation in all physical activities and lack of confidence in the activities of authorized deals.

Questions 12, 14, 24 and 25 assess the social health status which measures lack of social activities, having chest pain during daily activities, lack of participation in the work and being unable to deal with others. MacNew questionnaire is an appropriate instrument to use for

measurement of HRQoL, while its internal and external validity has been approved (8, 9). The alpha coefficient have been reported 92.0, 92.0, 94.0 and 95.0 for physical status dimension, emotional status dimension, social status dimension and Persian version of the MacNew HRQoL questionnaire, respectively (Hofer et al. 2004).

### Statistical analysis

The statistical analysis was performed using SPSS version 18 (SPSS Inc., Chicago, IL, USA). The t-test and analysis of variance (ANOVA) were used to analyze the collected data.

### 3. Results

The results showed that the majority number of subjects was women (60.8% women and 39.2% men). The minimum and maximum age of subjects was 20 and 82 years old, respectively, with an average age of 49-59. The majority number of valve replacement surgery (52%) was due to mitral valve disease, while the minority number of valve replacement surgery (1%) belonged to tricuspid valve disease. In terms of marital status, the highest numbers of subjects (89.2%) were married. The largest numbers of patients (43.1%) had primary education and the minimum number of patients (4.9%) had university qualifications. In terms of occupational status, the greatest number of patients (52%) was housewives and the lowest number of subjects (1%) showed to have teaching profession. The largest numbers of subjects (56.9 %) had no income, while it was just 6.9% of subjects who had enough income.

The result of t-test showed that there is a statistical difference between the total score of quality of life and all three dimensions of quality of life (physical health status, emotional health status and social health status) before and after valve replacement surgery ( $p < 0.001$ ). As result, the subjects' quality of life in all dimensions and in total score increased significantly.

### 4. Discussion

The study revealed that valve replacement surgery was an effective intervention to improve the HRQoL in patients with cardiac valve diseases. In addition, the study results showed that valve replacement surgery not only improves the physical health status of patients and relieves their signs and symptoms, but also improves the emotional health status and social health status in those patients. The study of Pfaffenberger et al. indicated a significant improvement in quality of life after surgery (Pfaffenberger et al. 2010). However, the total score of HRQoL in this study was lower than Pfaffenberger's study.

Besides in another study conducted by Benzer et al. the results revealed that the emotional health status score of subjects was improved significantly. They also compared HRQoL in patients who had surgery with patients who were treated with other therapies. Their results showed a statistical significant difference between two groups. They found HRQoL, particularly in the emotional health status, in patients who had surgery was increased more than patients who had other therapies (Benzer et al. 2003).

In addition, Johnson et al. found statistical significant differences in all dimensions of quality of life ( $p = 0.04$ ) after valve replacement surgery. Although in this study, the relationship between HRQoL and demographic characteristics of subjects did not examined, Johnson's study revealed that there is no statistical difference between HRQoL score with age, sex, education status and underlying conditions such as diabetes and hypercholesterolemia. Therefore, they concluded that valve replacement surgery can be considered as an effective intervention for all patients without considering their demographic characteristics (Johnson et al. 2006).

Although in this study, the HRQoL score between men and women was not compared, in a study by Falkvz et al. (2006) from France, they compared the quality of life between men and women after valve replacement surgery.

**Table 1.** Comparison of different dimensions of HRQoL in patients before and after valve replacement surgery.

Quality of life	Before surgery		After surgery		P value
	Mean score	SD	Mean score	SD	
Emotional health status	54.9	14.5	65.2	10.6	0.001
Physical health status	29.4	9.8	39.06	6.6	0.001
Social health status	16.7	4.3	19.5	3.09	0.001
Total	101.1	27.2	123.5	18.8	0.001

Data are presented as mean  $\pm$  standard deviation (SD).

The results indicated an improvement in quality of life in both men and women after valve replacement surgery. Besides the study result showed there is a statistical significant difference between men and women, suggesting the quality of life in women was lower than men (Falkvz et al. 2002).

Result of the study indicated that the HRQoL improve emotional, physical and social dimensions after valve replacement surgery in patients with cardiac valve diseases. Consequently, it would be recommended that surgery is an effective strategy to improve HRQoL in patients with moderate to severe cardiac valve disease. Since the number of subjects in this study was low and the study was conducted in just on medical center, it is recommended the study to be repeated in other centers with larger sample size.

### Conflict of interest

The authors declare that they have no conflict of interest.

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