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# QUALITY OF LIFE IN DIABETES PATIENTS IN IRAN: A SYSTEMATIC REVIEW AND META-ANALYSIS METHOD

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**Abstract**

**Introduction:** Diabetes is the fifth leading cause of death in the world which reduces the patients' quality of life. The purpose of this study is to investigate the quality of life of diabetes patients in Iran using Meta-Analysis methods.

**Materials and Methods:** The search was done using keywords of diabetes, quality of life, Iran in the foreign databases of Pubmed, Scopus, ISI, Google Scholar and native databases such as Sid, Medlib, Iranmedex, 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-23 and SF-36 questionnaires were used in the investigated studies.

**Findings:** In the 10 attempted studies in Iran with the sample size of 1082 people which were done from 2001 to 2015, the average quality of life score for diabetes patients was 59.94 (CI 95%: 36.78 to 83.10). The average quality of life score was in the aspects of social life 58.73, mental health 49.82, physical health 76.46 and vivacity 109.34. The mean score of quality of life of diabetic patients in the East of Iran was higher than other regions.

**Conclusion:** The average quality of life score for diabetes patients in Iran is higher in the SF-36 questionnaire compared to SF-20 one. In addition, there was no significant relationship between quality of life of diabetic patients and sample size and the year when study was conducted.

**Keywords:** Diabetes, Quality of Life, Iran.

## Introduction

The history of emphasizing on the concept of quality of life and psychosocial problems of chronic diseases, which affect the quality of life, dates back to 1970. After that time, the desire to assess and improve the quality of life of

these patients showed a significant growth (1). There is a reciprocal relationship between the disease and quality of life. Physical disorders and physical symptoms directly affect all aspects of quality of life (2).

Diabetes is a chronic disease that affects patients' quality of life and reduces it (3). Diabetes is the fifth leading cause of death in the world (4). In the United States, 15% of health care costs are accounted for it (5). Due to the growing rates of diabetes worldwide, the World Health Organization has announced it as a hidden epidemic and has made a call for all countries to deal with it since 1993 (6). Diabetics face symptoms of polyuria, polydipsia, nocturia and weight loss (4). There are types of diabetes and diabetes mellitus is the most common endocrine disease and according to WHO its prevalence will reach 380 million by 2025 (7). Diabetes mellitus is a systemic metabolic disorder that causes incorrect metabolism of carbohydrates, fats and proteins (6). Diabetes mellitus is the leading cause of blindness in adults and chronic renal failure (8). Diabetes type 1 and type 2 are two major types of this chronic disease and include about 10 and 90 percent of the population of diabetics, respectively (9).

Diabetics' quality of life is important. Lack of self-care, lack of good blood sugar control and diabetes complications increase reduces quality of life (10). This disease is growing by industrialization and urbanization. Low physical activity, dietary patterns of consumption, family history, stress and certain genetic and environmental factors are involved in the pathogenesis of this disease (11). Diabetes is considered as a stressor from the moment of diagnosis to carrying out treatment and care orders and may cause maladaptive mechanisms by the patients (12).

The most common complications include heart disease, kidney failure, nerve damage, defects in male sexual power and infection (2). Studies have shown that diabetics generally experience more negative outcomes including more deaths, long-term care and hospitalization, Wound infection, kidney dysfunction, respiratory problems, readmission after discharge, poor physical functioning and lower quality of life (13). Another study showed that diabetes affected various aspects of patients' life including psychological, physical, social, economic, family life and sexual function (14). Diabetics are 2 to 4 times more at risk of cardiovascular complications than non-diabetic patients and 2 to 5 times more likely to die (8).

The prevalence of type 2 diabetes in Iran is 4.5 to 6 percent and it was estimated be to more than 14 percent for people aged over 30 years and it is still increasing (3). It is estimated that the total number of people with diabetes will increase from 171 million in 2000 to 366 million in 2030 (6). Also, better control of Type I diabetes in patients older than 13 years can decrease the occurrence and prognosis of neurovascular complications by about 27-76%(2). According to the first national survey of risk factors for non-communicable diseases in Iran in 2004, 7.7% or 2

million adults aging 25 to 64 years old were diagnosed with diabetes (1). It is estimated that in each 20 deaths in the minimum age, one death is associated with diabetes and in adults aging 35 to 64 years in each 10 deaths, one death is associated with diabetes (1). It is estimated that Iran has between 5 to 7 million cases of diabetes and more than 50 thousand of them are children and adolescents (15)and (16). Several studies have evaluated the quality of life in diabetic patients in different regions of Iran; however, there is not yet a rough estimate of the quality of life in diabetic patients in Iran and the means score of diabetics' quality of life and its various aspects such as social life, mental health, physical health and vitality. Also, the means score of quality of life in diabetics is not clear in Iran from 2001 to 2015. This study was aimed at assessing the means score of diabetic patients' quality of life in Iran through systematic review and meta-analysis. At first, the study did a systematic review of previous studies and then performed a meta-analysis of the final data to assess diabetic patients' quality of life in Iran.

**Materials and Methods**

**Search strategy:** This is a meta-analysis study that considers the quality of life of diabetic 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 diabetes, quality of life 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 ("Iran", "Diabetes" and "Quality of Life"). The keywords were standard in MeSH and eventually (Iran AND Diabetes) 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 diabetes (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)(17). 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 questionnaires used in this study included the 36-item Short Form Health survey (SF-36) and the 20-item Medical Outcomes Study SF-20 (MOS) in 1989. The 36-item Short Form Health survey (SF-36) is one of the most popular standard questionnaires to measure quality of life (18). This questionnaire assesses the eight scales of physical functioning, role limitations due to physical problems, bodily pain, general health, joy and vitality, social functioning and role limitations due to emotional problems and mental health(19). The SF-20 questionnaire assesses various aspects and factors of quality of life. It is scored in different ways and its validity was estimated in America (6). The questionnaire of Quality of life in diabetic patients has 17 items which measures diabetic patients' quality of life and is also designed in way that measures aspects of quality of life separately (4).

**Statistical Analysis**

This study analyzed the prevalence of diabetic patients' quality of life in Iran to estimate its point prevalence of 95%. The variance of each study was calculated using the binomial distribution formula and heterogeneity of studies were investigated by the Cochrane Q-test with significance level of less than 0.1 and Index changes attributable to heterogeneity ($I^2$).

All statistical analysis was performed through STATA software (version 11) using the "metan" command. Meta-regression analysis was used to investigate the relationship between the quality of life of diabetic patients in Iran with sample size and years of research. Also, sensitivity analysis was used in order to evaluate the impact of each study on the overall result of the study.

## Results

### Inclusion method summary of studies to the meta-analysis:

In the first phase of the search, 19 articles were selected and after reviewing the titles, only 17 relevant articles were identified and included in the second phase which was the evaluation of abstracts. Finally, 10 articles were accepted for inclusion in the meta-analysis (Figure 1).

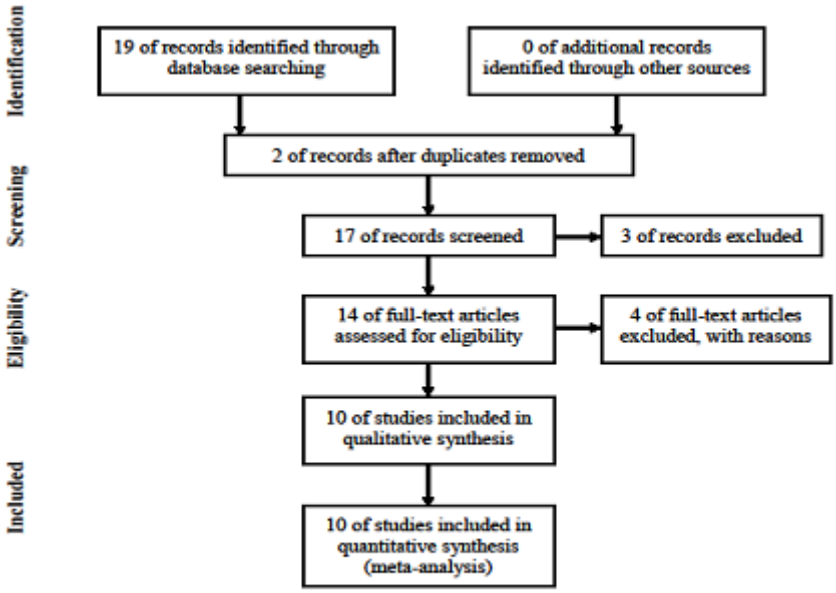


**chart 1: Fluchart of inclusion of studies to the systematic review and meta-analysis**

In 10 studies with a sample of 1082 people in Iran during the years 2001 to 2015, the mean score of diabetic patients' quality of life was 68.21 (95% CI, 44.52-91.89). By eliminating the study of Sayadi, as an outlier study, the mean score of diabetic patients' quality of life was calculated again and the result was 59.94 (95% CI, 36.78-83.13). In this study, the lowest and the highest scores of quality of life of diabetic patients in Iran were for Baghiani Moghadam et al study (25.51) and Sayadi et al study (1775.81), respectively. By eliminating Sayadi study, Vares et al study (105.80) was replaced and it was reported as the highest score of quality of life in diabetic patients in Iran. Also, the mean score of diabetic patients' quality of life in terms of public life was 58.73, mental health 49.82, physical health 76.46 and vitality 109.34. Due to the heterogeneity between studies, confidence interval for each study is shown in Figure 1 based on random-effects model.

**Table 1: Specifications of articles under review on the status of quality of life of diabetic patients in Iran.**

| Reference Number | Questionnaire | First Author's Name | Publication Year | City | Sample Size | QOL Mean Score for the | Standard Deviation |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | **diabetic** | |
| (2) | SF-36 | Afshar | 2013 | Kashan | 74 | 103.78 | 17.20 |
| (1) | SF-36 | Arian | 2010 | Tehran | 125 | ----- | ----- |
| (3) | SF-36 | Saeid poor | 2013 | Tehran | 60 | 43.5 | 15.7 |
| (13) | SF-36 | Heidari | 2004 | Zanjan | 47 | ----- | ----- |
| (20) | SF-36 | Wares | 2006 | Kashan | 310 | 105.80 | 44.10 |
| (21) | SF-36 | Kakhki | 2004 | Tehran | 131 | 46.20 | 13 |
| (4) | ---- | rakhshande ro Baghyani | 2001 | Tehran | 40 | 35.2 | 9.12 |
| (6) | SF-20 | moghadam | 2006 | Yazd | 120 | 25.51 | 9/76 |
| (22) | SF-36 | Delvarian zade | 2006 | Shahrood | 144 | ----- | ----- |
| (7) | SF-36 | Sayadi | 2007 | Ahvaz | **31** | 2311.94 | 395.25 |

**Table 2: The mean score of diabetic patients' quality of life in the groups studied in Iran.**

| **Subgroups** | **No. of Studies Sample Size diabetic QOL Percentage (CI 95%)** | **Samp le size** | **Mean score Quality of life diabetic (CI %95 )** | **Maximum diabetic QOL Percentage (CI 95%)** | **Minimum Addicts' QOL Percentage (CI 95%)** |
|---|---|---|---|---|---|
| Mean score Quality of life diabetic | **6** | **472** | **– 83/10) 59/94(36/78** | **– 110/71) 105/94(100/89** | **(23/76 - 27/26) 25/51** |
| The quality of life of the dimension of social life | **7** | **578** | **- 81/93) 58/73(35/52** | **- 170/19) 145/16(120/13** | **9/50(8/60 - 10/40)** |
| The quality of life of the dimension of mental health | **7** | **578** | **- 66/30) 49/82(33/34** | **- 176/43) 152/40(128/37** | **- 12/72) 11/60(10/48** |
| The quality of life of the dimension of Physical | **5** | **538** | **- 91/01) 76/46(61/91** | **(431/57 - 597/47) 514/5** | **-55/76) 53/50(51/24** |
| The quality of life of the dimension of liveliness | **2** | **156** | **- 216/17) 109/34(2/51** | **- 188/55) 164/52(140/49** | **- 59/30) 55/50(51/70** |

Quality of life of diabetic patients was different in various parts of Iran so that the mean score of diabetic patients' quality of life in three studies conducted in northern Iran was 41.63 (95% CI, 34.44 – 48.83). 3 studies were conducted in central Iran and the mean score was 78.34 (95% CI, 17.38- 139.30). Also, a study in East Iran showed the mean score of 177.81 (95% CI, 51.01 – 54.73), but we did not have a study in the South and West Iran. In the analysis that was done based on each questionnaire, the mean score of diabetic patients' quality of life in five studies that had used the SF-36 questionnaire in Iran was 91.76 (95% CI, 57.47-126.05). However, only one study was available from each of SF-20 questionnaires and diabetic patients' quality of life questionnaire.

In the analysis that was done based on diabetes type, the mean score of diabetic patients' quality of life in Iran was 77.94 (95% CI, 50.40-105.48). However, there was only one study that reported the the mean score of type 2 diabetic patients' quality of life which was 25.51 (95% CI, 23.76-27.26).

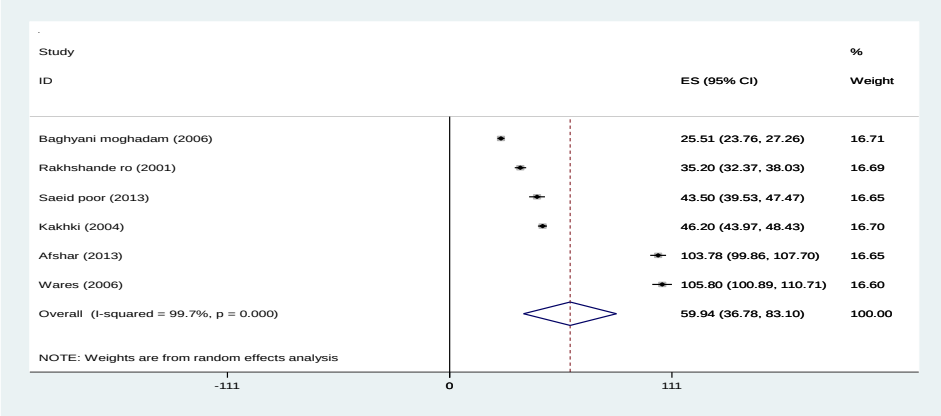


Figure 1. Total mean score of diabetic patients' quality of life and its 95% CI in Iran based on author's name, year of the study and random effects model. The midpoint of each segment showed diabetic patients' quality of life score in each study. Rhombus shape indicated diabetic patients' quality of life score in Iran in all studies.

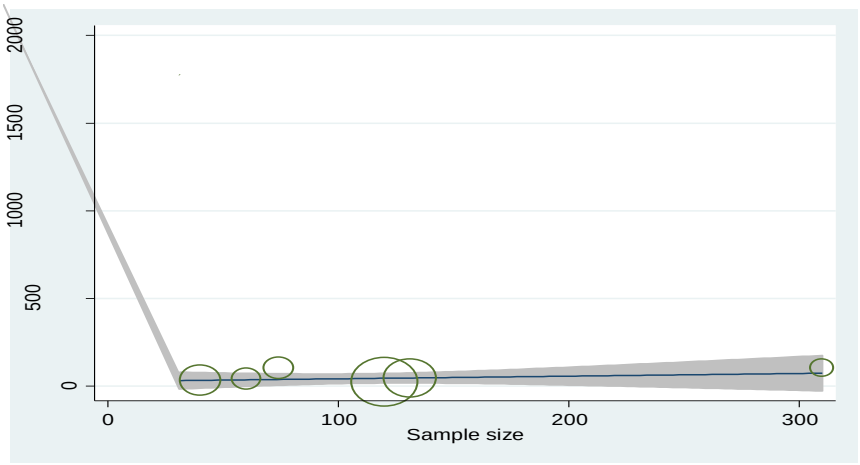


Figure 2. The relationship between diabetic patients' quality of life research sample size using meta-regression. (The size of the circle indicated largeness of the sample size. Based on the figure, there was no significant relationship

between diabetic patients' quality of life and sample size in Iran (P = 0.479). It meant that diabetic patients' quality of life would not increase by increasing the sample size of the research.)

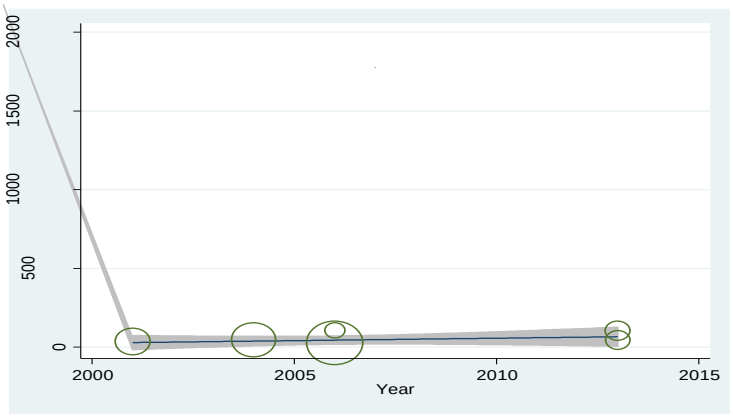


Figure 3. The relationship between diabetic patients' quality of life and year of study using meta-regression. (Based on the figure, there was no significant relationship between diabetic patients' quality of life and year of study in Iran (P = 0.989) and patients' quality of life did not increase during the years of this study, from 2000 to 2015.

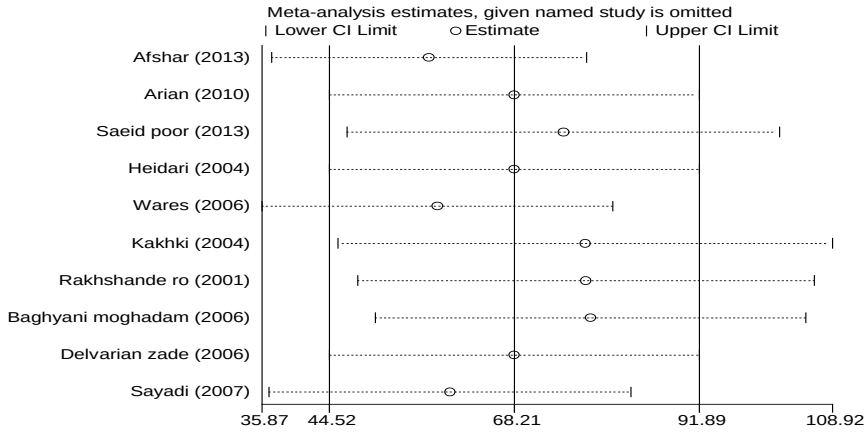


Figure 4. Sensitivity analysis (Circles showed the relative risk (RR) by removing the study and segments indicated 95% CI for RR). This chart showed the effect of the removal of any study on the final outcome of this study. According to the above graph, by removing Baghyani Moghadam's study in 2006, diabetic patients' quality of life in Iran increased to 77.94% (95% CI, 50.40%-105.47%). By removing the study of Afshar in 2013, diabetic patients' quality of life in Iran decreased to 57.24% (95% CI, 37.07%-77.41%). These two studies were the most effective studies in the final results of this study.

**Discussion**

10 studies were reviewed with a sample size of 1082 individuals from 2001 to 2015 and the mean score of diabetic patients' quality of life was 59.94 (95% CI, 36.78-83.10). The mean score of diabetic patients' quality of life in terms of public life was 58.73, mental health 49.82, physical health 76.46 and vitality 109.34. Diabetic patients' quality of

life was different in various parts of Iran. The mean score of diabetic patients' quality of life in northern Iran was 41.63, 78.34 for central Iran, and 177.81 in Eastern Iran; However, we did not have a study in the South and West of Iran.

According to the results, the quality of life of diabetic patients was better in the East of Iran than other regions and it was the lowest in Northern Iran. An analysis was done based on separate questionnaires and the mean score of diabetic patients' quality of life in Iran was 91.76 using the SF-36 questionnaire, 25.51 for the SF-20 questionnaire, and 35.20 for the standard Inventory of diabetic patients' quality of life. The highest and lowest mean scores of diabetic patients' quality of life were for the SF-36 and SF-20 questionnaires, respectively. An analysis was conducted by the type of diabetic disease and the mean score of diabetic patients' quality of life in Iran was 77.94 and 25.51 in patients with type 2 diabetes. This suggested that patients with type II diabetes suffered from poor quality of life more than other diabetics.

Several studies have shown that diabetic patients have a lower quality of life than non-diabetics (1). Sayadi et al (2007) evaluated and compared the quality of life of 80 diabetic and non-diabetic patients after open heart surgery in Ahvaz and concluded that the mean and standard deviation of the quality of working life score were 395.25 $\pm$ 2311.94 (7).

Delvarian et al (2006) evaluated the effect of diabetic dietary advice on the quality of life of type 2 diabetic patients who referred to Imam Hossein Hospital dietary clinic in Shahrood and the experimental group's mean and standard deviation of the quality of life score before the intervention were 18.55 $\pm$ 73.33 in the physical aspect, 8.20 $\pm$ 20.20 in the mental aspect, and 11.6 $\pm$ 46.7 in the social dimension (22). Vares et al showed that only 11.3 percent of diabetic patients have an acceptable quality of life (20). Given that different data was available for diabetics' quality of life score, the meta-analysis method was used to obtain accurate estimates of diabetics' quality of life score. Graue et al reported that as the age of juvenile diabetics was higher, their percentage of quality of life and self-care would be lower and this lower percentage is more in females (23). In their study, Li et al. (2009) showed that 36-SF scales of quality of life had no significant relationship with diabetes' control indicator (HbA1c) in patients with type 2 diabetes (24). The present study had several limitations which included lack of access to full-text articles, not referring to the mean and standard deviation of diabetic patients' quality of life score in some studies, and lack of uniform distribution of studies between different regions of the country.

**References:**

1. Arian V, Farvid M, Montazeri A, Yavari p. Association Between Health-Related Quality of Life and Glycemic Control in Type 2 Diabetics. Department of Community Nutrition, Faculty of Nutrition Sciences and Food Technology, National Nutrition and Food Technology Research Institute, Shahid Beheshti University of Medical Sciences,. Aban 2012;14(4):318- 24.
2. Afshar M, Memarian R, Mohamadi I. Study of Relationship Empowerment Taking care of yourself And quality of life to HbA1c In adolescents with diabetes. Feiz journal 2014;18(1):69-75.
3. Saeidpoor j, Jafari M, Ghazi Asgar M, Dayani Dardashti H, Teymoorzadeh E. The Impact of Self-care Education on Life Quality of Diabetic Patients. Journal of Health Administration. 2013;6(52):26- 36.
4. Rakhshande Roo S, Haidarnia A, Raja A. Study of The impact of health education on Diabetics Quality of Life. Jurnal of Rafsanjan University of Medical Sciences. Summer 2011;10(2):144-50.
5. Azizi F. A survey about the prevalence of diabetes and impared glucose tolerance (IGT) in people in age of over than 30 years old . Deputy of Ministry of Health, Medicine and Medical education 2002
6. Baghianimoghadam M, Afkhami ardakani M, Mazloomi S, Saeidizade M. Study of Quality of Life Type 2 diabetic patients , Yazd. jurnal Research University of Medical Sciences and shahid sodughi Health and Therapeutic Services. Vinter 2006;14(4):49- 54.
7. Sayadi N, Fayazi S, Ramazani A. Comparison Quality of life among Diabetiv and Non Diabetic Patients after open heart Surgery (short report). Jurnal of Rafsanjan University of Medical Sciences. Summer 2011 10(2):144-50.
8. Yun L, Hassan Y, Aziz N, all e. A comparison of knowledge of diabetes mellitus between patients with diabetes and healthy adults. a survey from north Malaysia patient educ couns 2007 69(1,3):47-54.
9. Heione RJ. Diabetes in the next century chahhenges and opportunities 1999;55:265-70.
10. Kotsanos J, Marrfero D, Viginati J, al e. Health- related quality of life results from multinational clinical trail of insulin lipro Diabetes Care 1997;20(6):948- 58.
11. Trevor M, Nicholas H. Holford . Averys drug treatment . pharmacoecono ,ocs and prescribing , new Zealand Adis press 1997 393.
12. Bradley C, Camsu D. Guidelines for encouraging psychological regional office for Europe and international diabetes federation European region st Vincent declaration action programme of diabetes. diabet med 1994 11 510 -6.

13. Heydari M, Alhani F, Kazemnejad A, Moezzi F. The effect of empowerment model on quality of life of Diabetic adolescents. Iranian Journal of Pediatrics. Spring 2007;17(71):87- 94.
14. Abdel Gawad E. Quality of life In Saudis with diabetes. . Saudi J Disabil 2002;8(3):163-8.
15. Agha Molaei T, Sobhani A, Yoosefi H, all e. Behavior and metabolic control of diabetic patients in Bandar abbas diabetic clinic. J Hormozgan Univ Medi Sci. 2003;7(3):111-5.
16. Shirazi M, Anoosheh M, Rajab A. The effect of self care program education by group discussion method on self concept in diabetic adolescent girls reffered to Iranian Diabetes SocietyRes Iran J Nurs 2011;6: 40-52.
17. Von Elm E, Altman D, Egger M, all e. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. Ann Intern Med 2007;147:573-7.
18. Ware JE J. The status of health assessment 1994. Annu Rev Public Health 1995;16:327-54.
19. Ware JE J, Gandek B. Overview of the SF-36 Health Survey and the International Quality of Life Assessment (IQOLA) Project J Clin Epidemiol 1998;51:903-12.
20. Vares Z, Zandi M, Baghaei P, Masoudi Alavi N, Mirbagher Ajorpaz N. Medical surgical nursing department, nursing faculty Kashan University of medical sciences. Iran J Nurs. 2010;5(17):14-22.
21. Darvish poor A, Abed saeidi J, Yaghmaei F, Alavimajd H, Montazeri A. Quality of life diabetic patients referred to tehran hospitals in 2004. Iranian Journal of Endocrinology and Metabolism , . Spring 2006;8(1):49- 56.
22. Delvarian M, Bagheri H, Sadeghian F. study of Diabetic Diet Advice on the The quality of life in patients with type 2 diabetes Referred to Nutrition Clinic shahrood Imam Khomeini Hospital. Journal of Diabetes and Lipid Disorders. Summer 2006;5(4):369-76.
23. Lee H, Chapa D, Kao C, al e. Depression, quality of life, and glycemic control in individuals with type 2 diabetes. J Am Acad Nurse Pract. 2009;21:214-24.