Quality of Life of patients with chronic kidney disease in Iran: Systematic Review and Meta-analysis

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Abstract

Introduction: Renal diseases are among the major health problems around the world that cause major changes in patients’ lifestyle and affect their quality of lives. The aim of this study was to evaluate the quality of life of patients with chronic kidney disease (CKD) in Iran through a meta-analysis. Materials and Methods: This study was conducted using authentic Persian and English keywords in the national and international databases including IranMedex, SID, Magiran, IranDoc, Medlib, Science Direct, Pubmed, Scopus, Cochrane, Embase, Web of Science, and Medline. The data were analyzed using meta-analysis (random effects model). Heterogeneity of studies was assessed using I2 index. In this study, SF-36: 36-Item Short Form health-related quality of life (HRQOL), kidney disease quality of life-SF (KDQOL-SF), KDQOL and KDQOL-SF-STM questionnaires were used. Data were analyzed using STATA Version 11 software. Results: A total of 17200 individuals participated in 45 reviewed studies, and the mean score of CKD patients’ quality of life was estimated by SF-36 (60.31), HRQOL (60.51), and KDQOL-SF (50.37) questionnaires. In addition, meta-regression showed that the mean score of CKD patients’ quality of life did not significantly decrease during the past years. Conclusion: The mean score of quality of life of patients with CKD was lower in different dimensions in comparison with that of normal people. Therefore, interventional measures should be taken to improve the quality of life of these patients in all dimensions.

Keywords: Iran, kidney patients, meta-analysis, quality of life, renal patients

Introduction

Quality of life is an important criterion that illustrates the effectiveness of health care, health level, and well-being. It is a multidimensional concept that includes ability, function, health, well-being, and psychological state, which is defined by the World Health Organization as values, goals, standards, and individual interests.[1-4] There is a relationship between diseases and quality of life. Quality of life can have a direct impact on physical performance, emotional, and physical problems, fatigue, mental health, social performance, physical pain, and general health.[5-10] Therefore, knowledge about chronic diseases, especially chronic kidney diseases (CKD) is very important in the evolution of patients’ health problems.[11-14] CKD is one of the major public health problems worldwide.[15-17] The incidence of chronic renal failure in the world is 242 cases per a million people, and 8% is added to this population each year.[18,19] The population of patients with renal failure in Iran is 320,000.[20,21] One of the ways to improve the condition of patients with chronic renal failure is hemodialysis.[18,22] In addition to hemodialysis, peritoneal dialysis and kidney transplantation are the common alternative treatments.[23] The patients undergoing dialysis have to spend several hours of their lives in dialysis sessions (2–3 sessions each week), and these constraints affect the living conditions of these patients.[18,24] In general, patients with CKD are affected by a wide range of physical, psychological, economic, and social problems[11,25-29] which ultimately influence their quality of lives.[30] Considering the contradictory results of previous studies and the importance of “quality of life” and its effects on the

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personal and social life in patients with CKD, the present study was carried out through meta-analysis to provide a general assessment of the quality of life of CKD patients in Iran.

**Materials and Methods**

**Search strategy**

In this study, the quality of life in patients with CKD in Iran was examined using a systematic review and meta-analysis. To access the relevant Persian and English articles, national and international databases including IranMedex, SID, Magiran, IranDoc, Medlib, ScienceDirect, Pubmed, Scopus, Cochrane, Embase, Web of Science, and Medline were searched using related Persian keywords and their English equivalent (“Iran,” “CKD Patients,” “CKD,” “Quality of Life”) along with the logical combinations of these keywords. The Google Scholar search engine was also used to find relevant articles. References of related articles were searched to come up with an exhaustive search.\(^{[11,25-29]}\) The search was done on databases from 2005 to May 2017.

**Inclusion and exclusion criteria**

The inclusion criteria referred to the quality of life in patients with CKD in Persian and English from 2000 to 2017. The exclusion criteria included nonrandom sampling, insufficient data, and statistical population other than in patients with CKD.

In the first stage, 231 articles on the quality of life in patients with CKD were found. After reviewing the titles, 113 articles were excluded due to the problem of duplication. The abstracts of all remaining articles were reviewed, and 39 irrelevant articles were omitted. The full texts of the remaining articles were reviewed, and 34 articles were included in conformity with the exclusion criteria. In the end, 45 articles entered the qualitative assessment process [Chart 1].

**Qualitative assessment of studies**

To assess the quality of studies, the preferred reporting items for systematic review and meta-analysis,\(^{[31]}\) which is a checklist specifically designed for meta-analyses and systematic reviews, were used.

**Data extraction**

Two researchers independently extracted the data from the sources to minimize the errors in data reporting, and thereby increase the accuracy of the gleaned data. The researchers designed a checklist for extracting data from the sources (the items of researcher-made checklist were the name of the first author, the purpose of the study, the number of samples, the year and place of research, the type of kidney disease, the type of quality of life questionnaire, the average age of the individuals, and mean and standard deviation (SD) of different dimensions of the quality of life in patients with CKD). Questionnaires used in the studies included the following:

- **SF-36 standard questionnaire**
  This is a short 36-item form consisting of two parts; the first part comprises demographic information, and the second part contains 11 questions that examine different aspects of health pertaining to quality of life. In fact, the second part of the SF-36 questionnaire is the same as health-related quality of life (HRQOL). These aspects include social function, limitations in the role due to physical problems, pain, mental health, limitations in the role due to emotional problems, and overall understanding of general health. Questions were rated by Likert Scale and ranged from 0 to 100, where higher points indicate a more favorable situation.\(^{[32-35]}\)

  The kidney disease quality of life-short form (KDQOL-SF) questionnaire, which is a multidimensional questionnaire that includes SF-36 questions and questions on CKD. The questionnaire assesses 12 factors of health and quality of life, including physical function, general health, the effects of CKD on life, imposed conditions, pain, sleep, social function, social support, energy, emotional roles, sexual function, and patient’s satisfaction. Questions were rated from 0 to 100, where higher points indicate more favorable conditions.\(^{[36,37]}\)

**Kidney disease quality of life-short form (KDQOL-SF) questionnaire**

This questionnaire is a specific tool for assessing the quality of life in hemodialysis patients and includes two general and specific scales on the quality of life. The general quality of life scale consists of two subscales of physical conditions and emotional conditions. The physical subscale contains four areas of general health (with 6 items), physical function (10 items), playing physical role (including 4 items), and physical pain (including 3 items). The subscale comprised emotional conditions comprising three areas of playing emotional role (3 items), social function (including 2 items), and mental health (including 8 items). The specific dimension of the research tool consisted of nine areas including CKD-related constraints (11 items), health-related mental problems (6 items), health-related physical function (12 items), general health (3 items), health-related family satisfaction (4 items), sleep status (score from 0 to 100), health-related occupational status (3 items), sexual issues (2 items), and satisfaction with

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**Chart 1:** Flowchart of steps involved in entering the studies into the systematic review and meta-analysis process.
care and ward staff (3 items). Each area has 100 points. This questionnaire is a multidimensional, valid, and reliable tool that addresses all aspects of the SF-36 questionnaire.\[38\]

**Statistical analysis**

The reviewed studies were combined based on the number of samples, mean, and SD. The standard error of the mean was calculated using SD/sqrt (n) equation according to the normal distribution. To evaluate the heterogeneity of the studies, Q test and I² index were used. Due to the heterogeneity in the studies, the random-effects model was used to combine the results of the studies. The significance level of the test was considered \( P < 0.05 \). Data were analyzed using Stata is a general-purpose statistical software package created in 1985 by StataCorp. Most of its users work in research, especially in the fields of economics, sociology, political science, biomedicine and epidemiology.

**RESULTS**

In 45 studies with a sample size of 17,200 people, the mean score of “quality of life” in CKD patients based on SF-36 questionnaire was 60.31% (95% confidence interval [CI]: 59.00%–51.62%), it was 51.60% (95% CI: 53.45%–49.75%) according to HRQOL questionnaire and 50.37% (95% CI: 54.77%–45.96%) based on KDQOL-SF questionnaire. Considering the heterogeneity of the studies in focus, the CI for each study based on the random effects model is presented in Figure 1 and Tables 1,2.

**DISCUSSION**

In 45 studies with a sample size of 17,200 people, the mean score of the quality of life in patients with CKD based on SF-36, HRQOL, and KDQOL-SF questionnaires was 60.31, 51.60, and 50.37%, respectively. However, the mean score of the “quality of life” based on KDQOL-SF™ and KDQOL questionnaires was not calculated since each of them was only used in a single study.

According to meta-regression diagram, there is no significant relationship between the quality of life in patients with CKD and the number of research samples, that is, with an increase in the number of research samples, the mean score of the quality of life in patients with CKD decreased, but this reduction is not statistically significant (\( P = 0.502 \)). In the above diagram, the size of the circle shows the magnitude of the sample size [Figure 2]. In Figure 3, meta-regression model showed that there is no significant relationship between the quality of life in patients with CKD and the year of study. In other words,

![Figure 1: Average quality of life in patients with chronic kidney disease in Iran (95% confidence interval) based on questionnaire according to random effects model. The middle point of each segment shows the quality of life score in chronic kidney disease patients in each study](image_url)

| Study ID | ES (95% CI) | % Weight |
|----------|-------------|----------|
| SF-36    | -1.28 (-3.87, 1.31) | 3.37     |
| Fouladi (2012) | 39.70 (35.37, 44.03) | 3.30     |
| Rostami (2013) | 44.29 (43.87, 44.71) | 3.40     |
| Edalati-Nozad (2013) | 44.70 (43.11, 47.29) | 3.37     |
| Kayari (2012) | 46.85 (40.09, 50.61) | 3.33     |
| Parvan (2012) | 48.40 (46.91, 49.89) | 3.39     |
| Namdar (2010) | 50.38 (46.09, 54.67) | 3.31     |
| Noohi (2005) | 52.37 (50.26, 54.48) | 3.38     |
| Zeraati (2009) | 53.56 (59.34, 57.78) | 3.31     |
| Baghahvi (2011) | 54.00 (52.32, 55.68) | 3.39     |
| Kachuee (2006) | 54.04 (52.28, 55.80) | 3.39     |
| Moghanab (2012) | 54.30 (51.61, 56.99) | 3.36     |
| Aghakhani (2007) | 60.21 (57.44, 62.98) | 3.36     |
| Raesifar (2009) | 60.60 (58.12, 63.08) | 3.37     |
| Tayebi (2012) | 60.60 (58.13, 63.07) | 3.37     |
| Malek-Ahmadi (2006) | 65.39 (61.66, 69.12) | 3.33     |
| Abbaszadeh (2008) | 89.54 (79.13, 99.95) | 2.91     |
| Heydarzadeh (2008) | 131.30 (127.44, 135.16) | 3.32     |
| Zamanzadeh (2005) | 139.50 (135.76, 143.24) | 3.33     |
| Subtotal (I²-squared = 99.7%, p = 0.000) | 60.31 (51.62, 69.00) | 63.28 |

| HRQOL | Emami-Naeini (2012) | 46.65 (41.41, 51.89) | 3.26     |
|       | Soleimanian (2012) | 49.81 (48.05, 51.57) | 3.39     |
|       | Noorbala (2006) | 52.50 (51.00, 54.00) | 3.39     |
|       | Dashti-Khavidaki (2011) | 53.20 (49.07, 57.33) | 3.31     |
|       | Noohi (2005) | 53.32 (51.79, 54.85) | 3.39     |
| Subtotal (I²-squared = 90.6%, p = 0.009) | 51.60 (49.75, 53.45) | 16.74     |

| KDQOL-SF | Rostami (2013) | 43.69 (41.37, 44.21) | 3.40     |
|          | Taheri (2011) | 47.22 (45.27, 49.17) | 3.38     |
|          | Shahgholian (2014) | 48.10 (43.94, 52.26) | 3.31     |
|          | Fardinifar (2011) | 54.70 (48.66, 60.74) | 3.22     |
|          | Hemati-Maslak (2013) | 54.70 (51.72, 57.68) | 3.36     |
|          | Mooirvandeh (2016) | 55.50 (51.49, 59.51) | 3.32     |
| Subtotal (I²-squared = 95.2%, p = 0.000) | 50.37 (45.96, 54.77) | 19.98     |
| Overall (I²-squared = 96.6%, p = 0.000) | 56.74 (52.02, 61.38) | 100.00    |

**NOTE**: Weights are from random effects analysis.
Table 1: Specifications of the articles reviewed on quality of life in chronic kidney diseases patients in Iran

| References | Author | Year | City | Age mean | Type of questionnaire | Type of disease | Sample size | QOL mean | QOL SD |
|------------|--------|------|------|----------|-----------------------|----------------|-------------|-----------|--------|
| [39]       | ZARGOOshi | 1989-2000 | Kermanshah | 33 | SF-36 | Donors and patients underwent nephrectomy | 400 | - | - |
| [40]       | Noorbala et al. | 2006 | Tehran | 49.53 | HRQOL | Kidney recipients | 164 | 52.5 | 9.79 |
| [41]       | Noohi et al. | 2005 | Tehran | 43.37 | HRQOL | Kidney transplant | 162 | 53.32 | 9.95 |
| [42]       | Kachuee et al. | 2006 | Tehran | 42 | SF-36 | Kidney transplant | 125 | 54.04 | 10.05 |
| [43]       | Noohi et al. | 2005-2006 | Tehran | 42.05 | SF-36 | Kidney transplant | 88 | 52.37 | 10.12 |
| [44]       | Baghaei et al. | 2011 | Guilan | >18 | SF-36 | Hemodialysis | 241 | 54 | 13.33 |
| [45]       | Taheri et al. | 2011 | Khorramshahr-Abadan | 47.43 | KDQOL-SF | Hemodialysis | 80 | 47.22 | 8.89 |
| [46]       | Yekaninejad et al. | 2012 | Sari-Zanjani-Tehran | 57.5 | KDQOL-SF | Hemodialysis | 212 | - | - |
| [47]       | Shakoor and Hassan Sadeghi | 2015 | Shiraz | 20-50 | SF-36 | Kidney transplant | 44 | -1.28 | 8.78 |
| [48]       | Kaviani et al. | 2012 | Ahvaz | 56 | SF-36 | End stage patients and hemodialysis | 122 | 46.85 | 21.2 |
| [49]       | Baljani et al. | 2014 | Urmia | 47.08 | KDQOL-SF | Hemodialysis | 82 | - | - |
| [50]       | Hadi et al. | 2010 | Shiraz | - | SF-36 | CKD under hemodialysis | 120 | - | - |
| [51]       | Fardinmehr et al. | 2011 | Isfahan | 52.7 | KDQOL-SF | End stage renal disease | 50 | 54.7 | 21.8 |
| [52]       | Ramezani Badr et al. | 2011 | Zanjani | 51.8 | KDQOL | Hemodialysis | 74 | - | - |
| [53]       | Fallahzadeh et al. | 2011 | Shiraz | 38.35 | SF-36 | Kidney donors | 144 | - | - |
| [54]       | Pakpour et al. | 2012 | Qazvin-Tehran | 57.8 | SF-36 | Hemodialysis | 512 | - | - |
| [55]       | Malekazadi et al. | 2006 | Tehran | 14.2 | SF-36 | Kidney recipients | 55 | 65.39 | 14.11 |
| [56]       | Raiisifar et al. | 2009 | Tehran | 41 | SF-36 | Kidney transplant | 218 | 60.6 | 18.7 |
| [57]       | Abbaszadeh et al. | 2008-2009 | Kerman | 41.98 | SF-36 | Kidney transplant and hemodialysis | 120 | 89.54 | 58.16 |
| [58]       | Tayyebi et al. | 2008 | Tehran | 44.88 | SF-36 | Kidney transplant and hemodialysis | 76 | - | - |
| [59]       | Moein-zadeh et al. | 2016 | Isfahan | 58.05 | KDQOL-SF | Hemodialysis | 52 | 55.5 | 14.75 |
| [60]       | Aghakhani et al. | 2007 | Urmia | 38.72 | SF-36 | Hemodialysis | 166 | 60.21 | 18.21 |
| [61]       | Rostami et al. | 2010-2011 | - | 55 | KDQOL-SF | Hemodialysis patients with viral hepatitis | 4101 | 43.69 | 16.99 |
| [62]       | Hemmati Maslakpakh and Shams | 2013 | Urmia | 47.03 | KDQOL-SF | Hemodialysis | 120 | 54.7 | 16.63 |
| [63]       | Parvan et al. | 2012 | Tabriz | 58.03 | SF-36 | Hemodialysis | 245 | 48.4 | 11.9 |
| [64]       | Emami Naenini et al. | 2012 | Isfahan | 52.78 | SF-36 | Hemodialysis | 51 | 46.65 | 19.08 |
| [65]       | Rostami et al. | 2010-2011 | - | 54.4 | SF-36 | Hemodialysis | 6930 | 44.29 | 17.7 |
| [66]       | Taheri-Kharamesh et al. | 2012-2013 | Qom | 50.4 | SF-36 | Hemodialysis | 95 | - | - |
| [67]       | Heidarzadeh et al. | 2008 | Bonab | 50.2 | SF-36 | Hemodialysis | 115 | 131.3 | 21.1 |
| [68]       | Aghakhani et al. | 2012 | Urmia | 45.2 | SF-36 | Hemodialysis | 70 | - | - |
| [69]       | Shahgholian et al. | 2014 | Isfahan | 50.4 | KDQOL-SF | Hemodialysis | 25 | 48.1 | 10.6 |
| [70]       | Hajian-Tilaki et al. | 2014 | Babol | 54.2 | SF-36 | Hemodialysis | 154 | - | - |
| [71]       | Pakpour et al. | 2008 | Tehran | 53.63 | SF-36 | Hemodialysis | 250 | - | - |
| [72]       | Tayyebi et al. | 2012 | Tehran | 41.24 | SF-36 | Kidney transplant | 220 | 60.6 | 18.7 |
| [73]       | Arab et al. | 2011 | Mashhad | 18.70 | SF-36 | Hemodialysis | 93 | - | - |
| [74]       | Dashti Khavidaki et al. | 2010-2011 | Tehran | 53.6 | HRQOL | Hemodialysis | 92 | 53.2 | 20.2 |
| [75]       | Zamanzadeh et al. | 2005 | Tabriz | 51.9 | SF-36 | Hemodialysis | 164 | 139.5 | 24.46 |
| [76]       | Shiraf and Vedad | 2007 | Shiraz | >15 | SF-36 | Hemodialysis | 90 | - | - |
| [77]       | Moghareh et al. | 2012 | Birjand | 18-70 | SF-36 | Kidney transplant and hemodialysis | 118 | 54.3 | 14.89 |
| [78]       | Edalat Nejad and Qlich Khani | 2013 | Arak | 63 | SF-36 | Hemodialysis | 115 | 44.7 | 14.15 |
| [79]       | Baraz et al. | 2004-2005 | Tehran | 61.4 | SF-36 | CKD | 85 | - | - |
| [80]       | Soleymanian et al. | 2012 | Tehran | 56 | HRQOL | Hemodialysis | 532 | 49.81 | 20.66 |
| [81]       | Zerati et al. | 2009 | Mashhad | 47.22 | SF-36 | Hemodialysis | 80 | 53.56 | 19.26 |
| [82]       | Fouladi et al. | 2012 | Isfahan | 54.5 | SF-36 | Hemodialysis | 96 | 39.7 | 21.64 |
| [83]       | Namdar et al. | 2010 | Jahrom | 56.48 | SF-36 | Dialysis | 52 | 50.38 | 15.8 |

SF-36: 36-Item short form, HRQOL: Health-related QOL, KDQOL-SF: Kidney disease QOL-SF, QOL: Quality of life, SD: Standard deviation, CKD: Chronic kidney diseases
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Different studies show that quality of life in patients undergoing dialysis in Iran is lower than that of other chronic diseases. [81] In a study by Vázquez et al. in 2004, there were clear differences between men and women with CKD compared to the normal population in terms of quality of life (physical function, limited role due to mental problems, social function, and general health), while women had a worse situation. [82] In another study, among hemodialysis patients in Saudi Arabia in 2011, AL-Jumaih et al. showed that the majority of patients had limited physical role, emotional role, job status, and cognitive function and had poor quality of life. [83] In a study by Nonoyama et al. in Toronto, Canada, it was found that the majority of hemodialysis patients had average quality of life during the studied years, the quality of life in patients with CKD in Iran has decreased, but this decline is not statistically significant ($P = 0.07$).

Table 2: The mean score of the quality of life in patients with chronic kidney diseases in Iran based on the type of questionnaire

| Type of questionnaire | Subgroups | Number of study | Sample size | QOL mean |
|-----------------------|-----------|----------------|-------------|----------|
| QOL in CKD patients based on SF-36 | Total | 19 | 9314 | 60.31 (51.62-69) |
|  | Physical | 28 | 11,097 | 50.59 (45.67-55.51) |
|  | Mental-psychological | 23 | 10,543 | 47.32 (40.84-53.81) |
|  | Social and occupational | 27 | 10,585 | 52.85 (41.57-64.14) |
|  | Vitality | 23 | 10,146 | 46.64 (34.48-58.79) |
|  | General health | 24 | 10,236 | 46.15 (40.48-51.82) |
|  | Physical pain | 24 | 10,236 | 52.35 (42.28-62.42) |
|  | Playing a physical role | 9 | 8319 | 37.14 (25.07-49.20) |
|  | Emotional | 10 | 8560 | 47.68 (42.57-52.79) |
|  | Role limitation for physical causes | 14 | 1841 | 42.99 (28.87-57.11) |
|  | Role limitation to emotional causes | 12 | 1577 | 46.21 (27.14-65.28) |
|  | Mental health | 4 | 361 | 51.38 (43.67-59.10) |

| QOL in CKD patients based on HRQOL | Total | 5 | 1001 | 50.37 (45.96-54.77) |
|  | Physical | 4 | 909 | 57.30 (45.23-69.16) |
|  | Mental-psychological | 4 | 909 | 50.50 (45.98-55.02) |
|  | Social and occupational | 3 | 858 | 49.83 (48.36-51.31) |
|  | vitality | 2 | 694 | 44.28 (36.76-51.81) |
|  | General health | 3 | 784 | 47.73 (45.71-49.75) |
|  | Physical pain | 3 | 784 | 43.24 (25.32-61.17) |
|  | Playing a physical role | 1 | 532 | 48.61 (46.00-51.22) |
|  | Emotional | 1 | 532 | 56.14 (53.12-59.16) |
|  | Role limitation for physical causes | 2 | 326 | 62.16 (58.26-66.07) |
|  | Role limitation to emotional causes | 2 | 326 | 63.04 (60.19-65.88) |
|  | Mental health | 2 | 326 | 44.34 (43.36-45.33) |

| QOL in CKD patients based on KDQOL-SF | Total | 6 | 4428 | 50.37 (45.96-54.77) |
|  | Physical | 4 | 4443 | 38.28 (32.80-43.75) |
|  | Mental-psychological | 3 | 4363 | 52.52 (47.20-57.84) |
|  | Social and occupational | 4 | 4443 | 55.90 (53.11-58.69) |
|  | Vitality | 4 | 4443 | 44.51 (40.40862) |
|  | General health | 5 | 4563 | 43.69 (41.41-45.97) |
|  | Physical pain | 4 | 4443 | 54.61 (48.09-61.13) |
|  | Playing a physical role | 2 | 4181 | 39.48 (12.02-66.95) |
|  | Emotional | 2 | 4181 | 34.30 (33.15-35.44) |
|  | Role limitation for physical causes | 2 | 262 | 23.09 (18.75-27.44) |
|  | Role limitation to emotional causes | 2 | 262 | 37.28 (15.58-58.97) |

KDQOL-SF: Kidney disease QOL-SF, CKD: Chronic kidney diseases, HRQOL: Health-related QOL, SF-36: 36-Item short form, QOL: Quality of life

Figure 2: The relationship between quality of life in chronic kidney disease patients and number of research samples using meta-regression
life. In a study by Chow and Wong, dialysis patients had the lowest quality of life scores in terms of physical health, social function, and dimensions of CKD including job status and burden of the disease. In studies conducted by Cleary and Drennan and Vasilieva, the mean score for physical and mental health was low and patients had poor quality of life.

The mean score of diabetic patients’ quality of life in Iran estimated by SF-36 was 59.94 (CI 95%: 36.78–83.10). The mean score of heart patients’ quality of life in Iran was 42.09 (CI 95%: 19.90–64.29). Among 17 accomplished studies in Iran with the sample size of 1476 from 2003 to 2015, the average quality of life score for patients with cancer in Iran was 42 (CI 95%: 34.05–49.96).

In other studies conducted in Iran, people over 50 had significantly lower scores in physical, psychological, and renal domains compared with younger people. In the study of Baraz et al., the highest scores of quality of life before intervention were related to physical function (60.3%) and social function (60%). The lowest scores were those of emotional role (41.9%) and health perception (43.5%). A study by Namadi and Movahhedpour demonstrated that 52.1% of hemodialysis patients had a moderate quality of life. In a study by Raisisifar et al., the quality of life in patients who underwent kidney transplantation in Tehran in 2009 was assessed; they found that the mean and SD of quality of life was 60.6%. Considering the different accessible data for the quality of life in patients with CKD, we used the meta-analysis method to obtain an accurate estimate of the quality of life in these patients.

Limitations of the study
Due to the different types of questionnaires used in the reviewed articles, the difference in scoring the questions of the respective questionnaires, and the difference in the number of questions in questionnaires, we could not combine the results of different questionnaires and report accurate statistics on the quality of life in patients with CKD in general and for various dimensions. Because of the variety of questionnaires, we did not manage to estimate the average score of the quality of life in patients with CKD in terms of type of disease, age, and place of research.

CONCLUSION
The mean score for quality of life of patients with CKD was estimated by SF-36 (60.31), HRQOL (60.51), and KDQOL-SF (50.37) questionnaires. In addition, meta-regression showed that the mean score of these patients’ quality of life has not significantly decreased during the past few years. The mean score of quality of life for patients with CKD was lower in different dimensions in comparison with that of normal people. The mean score of quality of life of patients with CKD in Iran was more than those of patients with heart diseases, diabetic patients, and patients with cancer. Therefore, interventional measures should be taken to improve the quality of life of these patients in all dimensions.

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Conflicts of interest
There are no conflicts of interest.

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Anxiety and depression are correlated with higher health-related quality of life in kidney patients. A study by Virzi et al. assessed the effects of omega-3 fatty acid supplementation on serum biomarkers, inflammatory agents, and quality of life in chronic kidney disease patients undergoing hemodialysis. The results indicated improved health-related quality of life (KDQOL-SF™ 1.3) in Iranian patients. The validity and reliability of the Persian version of kidney disease quality of life questionnaire-short form (KDQOL-SF™) in Iranian patients was reported by Fallahzadeh et al. in 2015. The validity and reliability of the persian version of kidney disease quality of life-short form (KDQOL-SF™ 1.3) in Iranian patients were also evaluated by Baghæi et al. in 2017.
