

Study of the quality of life in kidney donors at a transplant center in Urmia, Iran

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Abstract

Introduction: Maintaining and enhancing the quality of life (QOL) of living kidney donors are an essential measure for expressing health outcomes and consequences.

Objectives: This study aimed to investigate kidney donors' QOL at the transplant center of the Imam Khomeini hospital, Urmia, Iran.

Patients and Methods: This retrospective cohort study was conducted on 30 kidney donors between the years 1997-2014 at the Imam Khomeini Hospital, Urmia. To this end, a QOL questionnaire was completed and data analysis was performed with SPSS version 22.

Results: In this study, 90% (27) of the donors were male. The mean age of the donors at the time of examination and the duration of nephrectomy was 38 ± 9.48 and 7.36 ± 4.62 years, respectively. Fifty percent of the donors had a leave of absence more than 4 weeks after nephrectomy. The mean score of physical function, physical role, emotional role, vitality, mental health, social functioning, bodily pain, and general health was 77.66 ± 25.88 , 69.16 ± 35.16 , 54.44 ± 45.04 , 61.33 ± 17.06 , 64.26 ± 19.56 , 66.25 ± 22.54 , 81.25 ± 18.75 , and 61.83 ± 21.83 , respectively. However, none of the variables had a significant statistical relationship with QOL ($P < 0.05$).

Conclusion: Donors' QOL is lower in Iran than in other countries. It is suggested to conduct studies with a larger sample size and an appropriate control group.

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Introduction

Treatment options for end-stage renal disease patients include a variety of dialysis and kidney transplant procedures, although kidney transplantation is preferable to dialysis. A successful kidney transplant not only increases the chances of survival for patients, but also improves their quality of life (QOL) and enables them to return to work and have a normal life. Those who undergo a kidney transplant should decide whether they wish to receive a kidney from a deceased organ donor or from a living donor. Cadavers are a major source for organ transplant. However, the limited number of deceased kidney donors and the achievement of better living-donor kidney transplantation results have led to the expansion of living donor transplantation (1-9). Kidney donors are under intense emotional pressure and struggle for weeks to decide whether to give a kidney to their brother, sister, son,

Key point

Kidney transplant centers set up an electronic registration and follow-up system to monitor and check kidney donors for any health changes as much as they insist on continuing to monitor the health status of kidney recipients.

or daughter. Kidney donors may receive various painkillers postoperatively to be able to cough and breathe deeply. Medical teams encourage kidney donors to get out of bed as soon as possible for preventing deep vein thrombosis and lung infection. They are also recommended to eat and drink only after postoperative ileus resolves in them (10).

The concept of QOL and its determinants have evolved gradually since the 1980s and include aspects of the overall QOL that clearly affect physical or mental health. At the individual level, the concept deals with physical and mental health and related

issues, including health risks and conditions, functional status, social support, and socioeconomic status. Self-assessed health status has been shown to be more robust in predicting mortality than many objective health variables. Health-related QOL is related to both chronic illnesses reported by individuals and associated risk factors. The analysis of QOL data in the healthcare system can identify subgroups with relatively poorer healthcare quality and guide interventions to improve their condition to avoid more serious consequences (11).

Maintaining and enhancing the QOL of living kidney donors are a critical measure for expressing health outcomes and consequences (12). Results of studies by Glotzer et al in Albania (13), Shrestha et al in England (12), Mjøen et al in Norway (14), and Ebrahim et al in the United States (9) showed that, in general, all living donors had QOL similar to or better than the general population or the control group. The poor physical status of donors and recipients, the negative personal relationship between recipients and donors, and financial problems have been identified as factors reducing donors' QOL (15). Contrary to previous studies, a study by Zargooshi in Kermanshah, Iran, showed that kidney donors had significantly lower scores in all the criteria of the 36-Item Short Form Health Survey (SF-36) than a control group (16). The number of such studies is very limited in Iran as a major country in the field of kidney transplantation and most of the studies in this field have been conducted elsewhere in the world.

Objectives

Numerous studies have been performed on kidney recipients at Urmia's kidney transplant center. However, no study has so far been conducted on the QOL of kidney donors at this center. Therefore, the present study aimed to evaluate QOL in kidney donors at the transplant center of the Imam Khomeini hospital, Urmia.

Patients and Methods

Of 1906 cases of nephrectomy conducted from 1997 to the end of 2014 at the Imam Khomeini hospital in Urmia, 85 were not citizens of Iran (4.4%), 108 were deceased (5.6%), and 250 had incomplete medical files (13.1%) and thus they were all excluded. From the remaining 1463 cases (76.7%), 30 cases who were all living in West Azerbaijan province, Iran, were contacted through their phone numbers registered at the center during the donation and included in the study. Informed consent was obtained from the participants and their identities were kept confidential at all stages of the study. The participants responded to all the 36 items of SF-36. The scale has eight subscales, each consisting of 2 to 10 items. The subscales include physical functioning, role disorder related to physical health, role disorder related to emotional health, energy/fatigue, emotional well-being, social functioning, pain, and general health. The subscales were merged into two general subscales, namely physical and mental health

subscales. Lower scores obtained in SF-36 presented lower QOL.

Statistical analysis

Absolute and relative abundance metrics were used to describe qualitative variables and mean, standard deviation, and range of changes were used to describe quantitative variables in the donor population. The QOL variable as the dependent variable followed the normal distribution in the donors at the time of the study (the Shapiro–Wilk test, $P=0.225$). The variable of age was studied to assess the relationship between this variable and the quantitative variables. Spearman's correlation coefficient test was used to assess the time interval between the nephrectomies. A *t* test was used to assess the relationship between the classified variables of gender, donated kidney side, employment status, and residence location. The Mann-Whitney U test was used to examine the correlation between blood relationship and recipients. The ANOVA test was used to examine the relationship between educational status and recipients. Statistical analysis was performed using SPSS-22 software. A *p*-value of less than 0.05 was considered significant.

Results

In this study, the number of male donors, left kidney donors, and blood-related donors were 27 (90%), 28 (93.3%), and 26 (86.7%), respectively. The mean age of the donors at the time of the study and the time passed were 38 ± 9.48 years and 7.36 ± 4.62 years, respectively. Moreover, 50% (15 cases) of the donors had a leave of absence more than four weeks after nephrectomy (Table 1).

As living kidney donors in some studies were unable to perform their daily activities for months after donation due to nephrectomy and its complications, the evaluation conditions in this study were considered similar. In this study, 73.3% (22 cases) of the donors had a leave of absence less than one month (Table 2).

The mean and standard deviation of physical functioning, role disorder related to physical problems, role disorder related to emotional problems, freshness and vitality, mental health, social functioning, physical pain, and general health were 77.66 ± 25.88 , 69.16 ± 35.16 , 54.44 ± 45.04 , 61.33 ± 17.06 , 64.26 ± 19.56 , 66.25 ± 22.54 , 81.25 ± 18.75 , and 61.83 ± 21.83 , respectively (Table 3).

The highest and lowest scores obtained in SF-36 were related to the subscales of physical pain and role disorder related to emotional health, respectively.

None of the studied variables had a statistically significant relationship with the QOL of the donors ($P > 0.05$) (Tables 4 and 5).

Discussion

Determining and measuring the adverse effects of an illness on one's QOL, although not a means of determining the incidence of the disease, is essential in terms of human

Table 1. The frequency of living kidney donors and the leave of absence period (week) after nephrectomy (n = 30)

| Duration of their work absenteeism | Number | Percent |
|------------------------------------|--------|---------|
| <1 Week | 1 | 3.3 |
| 1-2 Week | 3 | 10 |
| 2-3 Week | 9 | 30 |
| 3-4 Week | 2 | 6.7 |
| >4 Week | 15 | 50 |
| Total | 30 | 100 |

Table 2. The frequency of living kidney donors and the leave of absence period (month) after nephrectomy (n = 30)

| Duration of their work absenteeism | Number | Percent |
|------------------------------------|--------|---------|
| <1 Month | 22 | 73.3 |
| 1-2 Month | 7 | 23.3 |
| >4 Month | 1 | 3.3 |
| Total | 30 | 100 |

Table 3. The mean value of QOL and its subscales in the living kidney donors during the study (n = 30)

| Variable | SD ± Mean | Range |
|---|---------------|-------------|
| Physical functioning | 77.66 ± 25.88 | 0-100 |
| Role disorder related to physical problems | 69.16 ± 35.16 | 0-100 |
| Role disorder related to emotional problems | 54.44 ± 45.04 | 0-100 |
| Freshness and vitality | 61.33 ± 17.06 | 25-95 |
| Mental health | 46.26 ± 16.56 | 28-96 |
| Social functioning | 66.25 ± 22.54 | 25-100 |
| Physical pain | 81.25 ± 18.75 | 32.5-100 |
| General health | 61.83 ± 21.83 | 5-100 |
| Physical health of Subclass | 72.47 ± 19.34 | 12.50-98.75 |
| Mental health of Subclass | 61.75 ± 20.94 | 26.25-94.25 |
| Quality of life | 67 ± 18.24 | 20.81-92.31 |

health considerations. However, there is controversy about QOL and health measurement. It is generally believed that these types of measurements can be directed toward formulating short intervention programs to help patients. These patients can be followed up for some period of time to evaluate the impact of treatment methods on their QOL. Measuring QOL can help prioritize health plans when resources are limited. Although the prioritization of resources in healthcare programs is often based on attenuation, QOL should also be considered in designing care evaluation programs since many chronic diseases are not fatal (17).

Preserving and enhancing donors' QOL are critical measures for the expression of health outcomes and consequences (12). Donors may have different opinions

Table 4. The relationship between the variables of age and time interval between the nephrectomies with QOL at the time of the study (n=30)

| Variable | The correlation coefficient (r) | P value |
|--------------------------------|---------------------------------|---------|
| Age at study time | r = 0.123 | 0.517 |
| Time interval from nephrectomy | r = 0.052 | 0.783 |

about QOL based on their religious values. As a result, measuring QOL and setting useful benchmarks for comparing data do not make findings generalizable (17).

Most studies have reported highly favorable health-related QOL in donors (16). Ebrahim et al in a study at the University of Minnesota, the United States, showed that 60% and 62% of donors respectively had higher physical and mental health scores than the general population with the same mean age and gender (15). The physical and mental health scores obtained in the scale in the present study were 72.47 ± 19.34 and 61.57 ± 20.94 , respectively. In studies by et al in England (12) and Mjøen et al (11) and Meyer et al (18) in Norway, except the body pain (BP) score, and in a study by Hussein et al in Bangladesh (19), except BP and general health scores, scores of other scales were better than those obtained in the present study. However, in a study by Zargooshi in Kermanshah, Iran (16), kidney donors had significantly lower scores in all the criteria of SF-36 than the control group and also compared to donors examined in other studies and in the present study. The BP score in Shrestha's study (13), Mjøen's study (14), the present study, and Zargooshi's study (16) was 78.03 ± 24.55 , 78.5 ± 26.1 , 81.25 ± 18.75 , and 64.9 ± 8.2 , respectively. In general, studies have shown that living kidney donors have QOL scores similar to or better than the general population or the control group (20, 16, 12-19). Reporting donors' QOL who are healthy can suffer from selection bias. Donors should be followed up after nephrectomy to protect them and monitor changes in the prevalence of risk factors (13). In Shrestha's study, kidney donors had a significant difference compared to the control group (RP = 70.83 ± 43.53 versus 92.10 ± 21.82) ($P < 0.001$). In contrast to the pre-donation health state, except role disorder related to emotional health (RE = 79.74 ± 29.9 versus 90.9 ± 31.24) and mental health (RP = 80.67 ± 17.10 versus 82.90 ± 13.86), all the other subscales significantly decreased after nephrectomy (12), indicating strict criteria for monitoring the donors' health.

In the present study, the lowest obtained score was related to the subscale role disorder related to emotional health (54.44 ± 45.04) whereas the highest obtained score was related to the subscale BP (81.25 ± 18.75). Similar to the present study, the lowest and highest scores obtained in other studies were related to the subscales role disorder related to emotional health (30.1 ± 10.9) and BP (64.9 ± 8.2), respectively (16). However, in other studies, the subscale vitality had the lowest score (19, 18, 12, 11). In fact, the QOL of Iranian donors is mostly affected by role

Table 5. The relationship between the donors' demographic variables with QOL at the time of the study (n=30)

| | Variable | Number (%) | Mean \pm SD | P value |
|--------------------------------|-------------------|------------|-------------------|---------|
| Residence | City | 26 (86.7) | 67.12 \pm 18.53 | 0.944 |
| | Village | 4 (13.3) | 66.41 \pm 18.82 | |
| Relation to the receiver | Unrelated | 26 (86.7) | 65.65 \pm 19.16 | 0.36 |
| | Related | 4 (13.3) | 75.93 \pm 6 | |
| Gender | Men | 24 (90) | 66.05 \pm 18.9 | 0.389 |
| | Women | 3 (10) | 75.8 \pm 7.34 | |
| Employment status | Free | 24 (80) | 67.21 \pm 17.52 | 0.485 |
| | Unemployed | 6 (20) | 67.27 \pm 21.98 | |
| Level of education | Illiterate | 5 (16.7) | 69.97 \pm 11.9 | 0.064 |
| | Elementary | 9 (30) | 57.28 \pm 20.88 | |
| | High school | 13 (43.3) | 67.63 \pm 16.49 | |
| | College education | 3 (10) | 88.7 \pm 3.08 | |
| The side of the donated kidney | | 28 (93.3) | 65.96 \pm 18.22 | 0.241 |
| | | 2 (6.7) | 81.83 \pm 14.81 | |

disorder related to emotional health. This may be because the majority of kidney donors in Iran are male and men are less talkative and have less interpersonal relationships. On the other hand, in most Iranian families, only men are responsible for living expenses, which probably affects their QOL.

Studies on factors affecting the QOL of living kidney donors have yielded inconsistent results. Low donor-recipient physical status, negative recipient-donor personal relationship, and financial problems have been identified as factors negatively affecting the QOL of donors (15). In a study by Ay et al, QOL was better in younger, male, and educated individuals (21). The results of bivariate analysis in the present study showed that none of the studied variables had a statistically significant relationship with QOL at the time of the study. In a study by Shrestha et al., variables such as age, sex, interval time from donation, and blood-related donors had no effect on QOL (12). In the study by Meyer et al, no significant difference between the group of individuals below 70 years and those aged 70 years and over was detected. However, men had significantly higher physical role ($P = 0.01$) and emotional role ($P 0.03$) scores than women (18).

In the present study, 50% of the donors had a leave of absence more than 4 weeks after nephrectomy. In a study by Glotzer et al, more than 70% of donors similarly had a leave of absence more than 4 weeks. It is known that nephrectomy can be performed through open or laparoscopic surgery (22). One of the benefits of a laparoscopic procedure is less pain after surgery and the higher probability of a quicker return to work and life's normal activities (23, 22). Similar to the present study, open nephrectomy was performed in all cases in the study. However, 53.2% of donors in the study had a leave of absence more than three months (21), while the majority of the donors (73.3%) in the current study had a leave of absence less than one month.

The number of studies on the QOL of kidney donors is

very limited in Iran as a major country in the field of kidney transplantation and most of the studies in this field have been conducted elsewhere in the world. In general, donors at foreign kidney transplant centers did not express regret after kidney donation and the majority of them stated that they would donate kidneys if they had another opportunity (11 and 24-26). However, in a study by Zargooshi, 85% of donors responded that if they were given another chance, they definitely would not donate again, and 76% of donors severely prevented potential donors from "repeating their mistake" (16). Generally, not all donors can be followed-up and donors who are not tracked may have lower QOL. Therefore, the actual QOL cannot be determined. Due to the small sample size of the study (only 30 donors accepted the invitation and collaborated in completing the questionnaire), it was needed to perform bivariate analysis. Moreover, the effect of increasing age on QOL, the inability to separate the effects of age from the effects of the interval between donation time and time of QOL reassessment, and the lack of an appropriate control group may limit the generalizability of the study's results. The QOL of donors at the Imam Khomeini Transplant Center, Urmia, was lower than that in international studies. It is recommended to perform studies by following up more donors and appropriate controls. It is also recommended that kidney transplant centers set up an electronic registration and follow-up system to monitor and check kidney donors for all their health changes as much as they insist on continuing to monitor the health status of kidney recipients.

Limitations of the study

This investigation is a single-center study, we suggest larger studies on this subject.

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Authors' contribution

EAK and MGG were the main investigators, collected the data and wrote the first draft. SS, HN, ATA and HRK designed the study, and also read and corrected the draft. All authors read and signed the final manuscript.

Conflicts of interest

The authors declare no conflict of interest.

Ethical issues

Human rights were respected in accordance with the Helsinki Declaration 1975, as revised in 1983. The Ethical Committee of the Urmia University of Medical Sciences approved the study (Ethical code# Ir.umsu.rec.1394.131). Accordingly, written informed consent was taken from all participants before any intervention. This study was extracted from MSc thesis of Ehsan Allah Kalteh at this university (Thesis# 94-40-1747). Moreover, ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

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