

Socioeconomic Links to Health-Related Quality of Life, Anxiety, and Depression in Kidney Transplant Recipients

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Introduction. The impact of socioeconomic status on the chance of being a candidate of kidney transplantation and its effect on graft survival has been documented. Our aim was to investigate the association of socioeconomic status with kidney allograft recipients' health-related quality of life and level of anxiety and depression.

Materials and Methods. Two hundred and forty-two kidney transplant recipients were categorized according to their monthly family income into low-income, moderate-income, and high-income groups. These groups were compared in terms of health-related quality of life (short form-36) and level of anxiety and depression symptoms (hospital anxiety depression scale).

Results. There was a trend of higher HRQOL scores in association with a higher income, which was significant for the total HRQOL score and its subdomains of physical function and role limitation due to physical and emotional problems. A slight increase in anxiety symptom scores was also seen in kidney recipients with lower incomes; however, the depression symptom scores were not significantly different between the income groups. Logistic regression analysis showed that the impact of income on the total HRQL and anxiety symptoms scores remained significant after controlling the effect of age, sex, and time interval from transplantation.

Conclusions. A significant proportion of our kidney allograft recipients had a low income and had a poorer health-related quality of life and a greater load of anxiety according to their perception of their status, compared to those with higher incomes. Special consideration to kidney transplant recipients with a lower income may improve their wellbeing.

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INTRODUCTION

Despite significant medical advances and improved public health in the recent decades, socioeconomically disadvantaged patients with chronic illnesses continue to suffer an unequal burden of illness, premature death, and disability. The study of the impact of socioeconomic disparities on chronic diseases, conditions, and risk factors

is important and necessary.¹ Some studies have reported that a poor socioeconomic status (SES) is associated with worse health outcomes, however not all studies are in line with this conclusion.^{2,3} We need additional knowledge about this linkage in the context of kidney transplantation. In the case of kidney transplantation, health-related quality of life (HRQL) is poor among transplant recipients.^{4,5}

In addition, anxiety and depression not only are higher in kidney transplant recipients in comparison to healthy controls, but also are known as possible cause of higher morbidity.⁶⁻⁸ The current study was conducted in our transplantation center to investigate the association between SES level and the recipients' HRQL and their level of anxiety and depression.

MATERIALS AND METHODS

Patients

In a cross-sectional study, 242 kidney transplant recipients who had received a kidney at Baqiyatallah Hospital, in Tehran, Iran, in 2006, were categorized into 2 groups based on their monthly family income. A monthly income less than US \$ 300 was considered low income; between US \$ 300 and US \$ 400 as moderate income, and higher than US \$ 400 as high income.^{9,10} The study was approved by the ethics committee on human research of Baqiyatallah university, and written informed consent was obtained from all participants prior to taking part.

Study Outcomes

The three income groups were compared for HRQL, and symptoms of anxiety and depression. The HRQOL of patients was measured using the 36-item Medical Outcome Study Short Form Health Survey (short form [SF]-36).¹¹ The SF-36 is a generic multidimensional measure of HRQOL that contains 8 subscales representing physical functioning, social functioning, role limitations due to physical health problems, role limitations due to emotional problems, mental health, vitality, bodily pain, and general health perceptions. Subscale scores are transformed to a zero-to-100 scale with higher scores indicating better HRQOL. The physical and mental components of the 8 scales were combined into a physical composite score and a mental composite score.¹¹ The Farsi version of the SF-36 was used to ensure face validity and maximize acceptability in the Iranian participants.¹² The SF-36 questions were answered by the patients, but in some cases an interviewer's assistance was needed.

Symptoms of anxiety and depression were assessed using the Hospital Anxiety and Depression Scale,¹³ namely, a translated version that had been previously validated for the Iranian

population.¹⁴ Higher scores indicate more prominent symptoms.

Statistical Analyses

Statistical analysis was conducted using the SPSS software (Statistical Package for the Social Sciences, version 13.0, SPSS Inc, Chicago, Illinois, USA). The 1-way analysis of variance was used for comparing HRQL, anxiety, and depression scores between the participants with different income levels. Logistic regression was used to test whether the impact of income on the assessed parameters remained significant after controlling the effect of age, sex, and time interval from transplantation. A *P* less than .05 was considered significant.

RESULTS

Patients

Of a total of 242 kidney transplant recipients, 165 (68.2%) were men. The mean age of the participants was 36.0 ± 14.0 years (range, 18 to 72 years). The mean interval between the study time and transplantation was 35.0 ± 13.0 months. All of the patients were had governmental health insurance coverage.

Income and Quality of Life

There was a trend of higher HRQOL scores in association with a higher income, which was significant for the total HRQOL score and also its subdomains of physical function, role limitation due to physical problems, and role limitation due to emotional problems. Also, slight differences were seen in the physical and mental composite scores, corresponding to a better condition proportional to income (Table)

Income and Anxiety and Depression Symptoms

A slight increase in anxiety symptom scores was also seen in kidney recipients with lower incomes; however, the depression symptom scores were not significantly different between the income groups (Table).

Multivariate Analysis

Logistic regression analysis showed that the impact of income on the total HRQL and anxiety symptoms scores remained significant after controlling the effect of age, sex, and time interval from transplantation.

Health-Related Quality of Life and Anxiety and Depression Symptoms Scores in Kidney Transplant Recipients With Different Income Levels*

Parameter	Income Groups			P
	Low	Moderate	High	
SF-36				
Physical Function	64.97 ± 28.20	64.76 ± 28.12	80.83 ± 21.50	.03
Role limitation due to physical problem	60.83 ± 28.09	71.83 ± 28.40	73.44 ± 26.47	.03
Bodily pain	33.97 ± 27.73	33.04 ± 23.49	21.98 ± 24.98	.13
Social function	48.96 ± 17.18	47.28 ± 19.57	51.56 ± 15.77	.69
General mental health	44.21 ± 9.39	44.36 ± 9.47	47.71 ± 7.17	.22
Role limitations due to emotional problem	60.38 ± 29.05	73.01 ± 25.12	84.72 ± 23.40	.001
Vitality energy or fatigue	40.85 ± 10.25	36.44 ± 11.63	41.11 ± 7.94	.15
General health perception	47.50 ± 14.63	45.87 ± 15.71	42.92 ± 9.88	.32
Physical composite score	54.42 ± 13.14	55.77 ± 13.29	61.06 ± 10.45	.06
Mental composite score	47.38 ± 7.95	48.72 ± 7.03	51.36 ± 5.06	.05
SF-36 total	51.76 ± 10.70	53.89 ± 10.39	59.02 ± 7.98	.005
HADS				
Anxiety	7.23 ± 3.33	6.42 ± 3.40	5.00 ± 2.09	.07
Depression	10.87 ± 2.40	10.77 ± 2.01	10.25 ± 1.66	.67

*SF-36 indicates short form-36 which is derived from the Medical Outcome Study Short Form Health Survey.¹¹ Higher scores demonstrate better quality of life. HADS indicates Hospital Anxiety and Depression Scale, and higher scores show more severe symptoms.¹³

DISCUSSION

According to our findings, in the posttransplantation phase, there is a link between the income level of kidney allograft recipients and HRQL and anxiety symptoms. Our study, however, failed to report a higher rate of depressive symptoms in low-income recipients. We showed that just 10% of the kidney transplant recipients in our center had a monthly income higher than US \$ 400. A previously published study from Iran indicated that more than 50% of the kidneys of living unrelated donors are donated to “poor” patients.¹⁵ These highlight that in Iran—as listed as one of the characteristics of the Iranian model of kidney transplantation—poor socioeconomic status is not an excluding factor from the transplantation list.¹⁶ However, in several other countries, a low economic status is an important limiting factor for access to kidney allografts.¹⁷⁻²¹ Regarding the large number of patients with low or medium income in our cohort, the link between HRQL of the kidney transplant recipients and their income was prominent, in line with the results of some other studies.²² This link has been suggested to be more strong than the link of socioeconomic status and race or ethnicity.²³

Not only the negative impact of low income on HRQL was seen in our kidney transplant recipients, but also the anxiety level was higher in this population. Similar reports have been

previously published in patients on dialysis as in general population.^{24,25} Finances is one of the most stressful items after kidney transplantation that can cause anxiety. Furthermore, some studies indicated that life events and other types of stressors after kidney transplant are clearly related to the socioeconomic position of the patient.²⁶ Socioeconomic status appears to be an important determinant of health and well-being. People with poor socioeconomic status are prone to a wide range of psychosocial and environmental strains. A higher financial stress is predictive of anxiety, severe functional limitations, and consequently, poor self-rated health.²⁶

Socioeconomic variables, such as income and insurance status, are known to be associated with access to health services for all patients, including those with special healthcare needs.²⁷ In kidney recipients, there are also other reasons that make socioeconomic status influential: low income is one of the common reasons for excluding patients from kidney transplantation.²⁸ In addition, a poor socioeconomic status negatively affects transplantation outcome. Financial constraints can adversely affect patients’ capacity to maintain a kidney transplant; it was shown that low-income patients were more likely to experience allograft failure after 1 and 5 years of graft function than patients with adequate income.²⁹ Low-income kidney recipients are more likely to be noncompliant

with the immunosuppressive regimen.³⁰ The high costs of immunosuppressive drugs and limited insurance coverage may result in noncompliance.³¹ Although in the Iranian model a great amount of transplant and posttransplant expenses are covered by the government, immunosuppressive medications are still expensive even for patients with adequate health insurance.

In order to speculate the possible mechanisms of the negative impact of low income on self-perceived health status, several explanations have been proposed, including differences in lifestyle, exposure to different stresses, and differences in available supportive resources.³² Financial resources may also impact self-care, such as putting time into exercise or being able to purchase food with high nutritional value.³³ Disparities in access to healthcare may be another explanation. Despite supports by the governments, it is believed that income still may play a dominant role in access to healthcare and quality of care in some countries.³⁴ Some has even reported a difference between low- and high-income kidney transplant recipients in their access to the type of required medications.³⁵ However, it is less likely for our study population to be affected by differences in their medication type, because all participants were have full governmental insurance. Nonetheless, our results showed that even with full insurance coverage, income still played an important role in health perceptions among the kidney allograft recipients. This is unfortunate that healthcare insurance does not eliminate the negative impact of poverty on health measures. We should note that the Iranian model of transplantation, although provides an extensive healthcare support free of charge, requires to be more developed by a comprehensive support of the recipient in order to promote their HRQL.

Our study, because of its design, cannot elucidate the direction of causality. It is possible that a low income may lead to activity limitation, but it is also possible that activity limitation, by limiting paid work possibilities, lead to low income.³⁶ Most of literature seems to conclude that it is low income that causes ill health. Whatever the direction is, the important point is that the link between poor health and poverty should be broken by health policy makers. It is a must for healthcare systems to break this link.³⁷

CONCLUSIONS

It seems that a significant proportion of kidney allograft recipients in Iran have a low socioeconomic status and have a higher morbidity rate in terms of lower HRQL and a higher level of anxiety. We recommend a closer observation for perceived health status in kidney allograft recipients with a lower socioeconomic status. Special approaches to kidney transplant recipients with a lower income may improve their wellbeing.

CONFLICT OF INTEREST

None declared.

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