Original Article

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Socio-demographic Factors Affecting Health-related-quality of Life in Post-renal-transplant Patients

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Abstract:

Objective: The objective of this study was to identify the socio-demographic factors affecting health related quality of life in renal transplant recipients.

Material and Methods: A census of all registered post-renal-transplant patients was conducted from October 1, 2018, to January 31, 2019. Data were collected on a Kidney Disease Quality of Life questionnaire (SF-1.3) and analysed by Statistical Package for the Social Science (SPSS). Scores in the three main domains, physical component summary (PCS), mental component summary (MCS), and kidney disease component summary, were calculated. Mean scores for gender, type of donor, and employment were compared by unpaired t-test, while mean scores for age, level of education, and duration of transplant were compared by analysis of variance.

Results: Out of 315 patients, 277 (87.9%) were males and 38 (12.1%) were females. The mean age was 37.26 (±10.14) years. Live unrelated transplants were 58.41% while live related transplants were 41.58%. Males had a significantly higher average (p-value=0.001) PCS score, but females had significantly higher average (p-value=0.05) MCS score. There was variation with respect to the PCS (p-value=0.031) and MCS (p-value=0.001) scores in the different age categories. The education groups varied significantly with respect to MCS (p-value=0.05). The recipients of live unrelated transplants had significantly lower average PCS score.

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Conclusion: The female gender, live related donor and variations in ages were associated with lower PCS scores, while male gender, variations in ages, and education were associated with lower MCS scores. This study demonstrates that the Kidney Disease Quality of Life Short Form-1.3 (KDQOL SF-1.3) is a good tool to reveal differences in HRQOL scores in renal transplant recipients.

Keywords: HRQOL, KDQOL SF-1.3, kidney disease component summary, mental component summary, physical component summary, renal transplant

Introduction

According to the World Health Organization (WHO), health has physical, mental, and social wellbeing components in its spectrum[1]. The mental and social domains of health in definition of health promoted research into the health-related quality of life (HRQOL) with chronic diseases requiring lifelong care. Isolated assessment of health status is insufficient to measure the full impact of disease on wellbeing. HRQOL measurements translate subjective perspectives of patients into objective assessments that reflect their HRQOL. HRQOL is a dynamic concept that incorporates past experiences, present circumstances, and future expectations into a holistic assessment of health. The quality of health is operationalized in terms of physical, mental, and social functioning domains[2].

The prevalence of chronic kidney disease (CKD3) is reported as 12.5% in Karachi[3]. The prevalence of end-stage renal disease (ESRD) in Pakistan is reported as 100 patients per million population (ppmp). Only 10% of these patients have access to renal supportive therapy (RST)[4]. The prevalence of CKD grades 1and 2 is 5-7% worldwide with a major contribution from developing countries. Patients from Pakistan and India have lower mean ages at the time of initiation of RST as compared to other nations. This represents the economically productive age group leading to loss of work force[5].

The treatment of choice for ESRD is renal transplant[6]. Reported transplant rate in Pakistan is 8-10 ppmp. Almost 50% of the transplants are paid kidney donations. Patients face difficulty in getting living-related donors[4]. Poverty, lack of public funds, and few expert teams are some other hurdles[7]. Despite these difficulties, patients with ESRD opt to undergo renal transplantation to achieve a sense of normality and live a more active life and. It is important to weigh whether these objectives are achieved[8]. Survival alone is not sufficient to assess the treatment benefits[9].

HRQOL scores independently predict mortality and graft failure[10]. This prognostic value of HRQOL measurements justifies health-related quality of life studies[11]. If a particular symptom or a biochemical abnormality is at one end of the spectrum of the human health continuum, then HRQOL is at the other end. HRQOL is an established important issue after organ transplantation. HRQOL measurements cover all aspects of daily living[11].

Quality of life benefits after renal transplant relate to patients on average and do not pertain to all transplant recipients. Differences have been seen in the HRQOL scores of different cohorts of patients[11]. One issue of importance is to precisely identify social and demographic factors that affect HRQOL and direct interventions to enhance the HRQOL.

There are various studies in the literature which have reported that some of the factors associated with lower HRQOL are Asian ethnicity, female gender, unemployment, lower education, and the early post-transplant period[9,11]. These studies were done mostly in western countries.

Patients face many physical and mental challenges as a result of their condition and lifelong management of transplants. These challenges are related not only to the primary diagnosis but also to physical and mental limitations

and treatment side effects. The goals of treatment are expanding beyond the pharmacological management of the condition to encompass health-related quality of life issues[12].

Understanding the HRQOL in renal transplant recipients is important in the wake of ever-increasing ESRD and transplant patients. Incorporating HRQOL issues into management plans will lead to comprehensive rehabilitation of patients in terms of quality of life. With an increasing incidence of ESRD in Pakistan and the increasing availability and use of renal transplants, this study was conducted to understand the perspective of renal transplant recipients concerning certain HRQOL factors. This will provide evidence to prospective renal transplant candidates in terms of their expectations about their life after the transplant. This might also help as a screening strategy for identifying mental and physical health impairments after transplant, to refer these patients for intervention and rehabilitation.

Material and Methods

This was a cross-sectional study conducted at the Department of Nephrology, Institute of Kidney Diseases Hayatabad Peshawar. The Advanced Studies and Research Board of Khyber Medical University approved the study at its 62nd meeting on September 26, 2018. Ethical approval was obtained from the Ethical Review Committee of the Institute and data collection was done from October 1, 2018, to January 31, 2019.

All registered post-renal transplant patients of the Institute of Kidney Diseases Hayatabad Peshawar were enrolled for a census study provided they met the inclusion criteria. Patients were approached during their routine follow-up monthly visits. Patients aged 18 years or more and post-transplant 16 weeks or more having no infection during the previous 4 weeks were interviewed to fill the questionnaire. Patients with acute graft rejection, currently admitted/remained or admitted in the previous 4 weeks for any reason or chronic allograft nephropathy requiring renal supportive therapy were excluded.

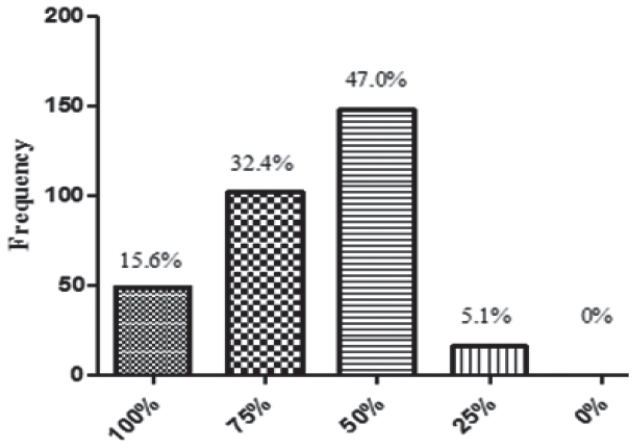
Background information including gender, age, education, duration of transplant, previous RST, comorbidities, donor related or unrelated, relation with the donor in case of related, employment status, and immunosuppressant medications was recorded on a data collection form. Patients were interviewed by investigator in office setting after proper training of the investigator according to the instructions by RAND (http://www.rand.org). Those patients who were able to fill the questionnaire by themselves were allowed to do so. The data were collected using a KDQOL SF-1.3 questionnaire Urdu version[13].

The data were analysed using SPSS 20. The mean scores for the three domains, kidney disease component summary (KDCS), physical component summary (PCS), and mental component summary (MCS) were calculated. Continuous variables were calculated as mean with standard deviation and categorical variables as frequencies and percentages. Analysis of variance (ANOVA) was done to compare age groups, education, and duration of transplant. Unpaired t-test was applied for comparison of gender, employment status, and type of donor. These variables were compared across the PCS, MCS, and KDCS domains. A p-value of ≤0.05 was considered statistically significant.

Results

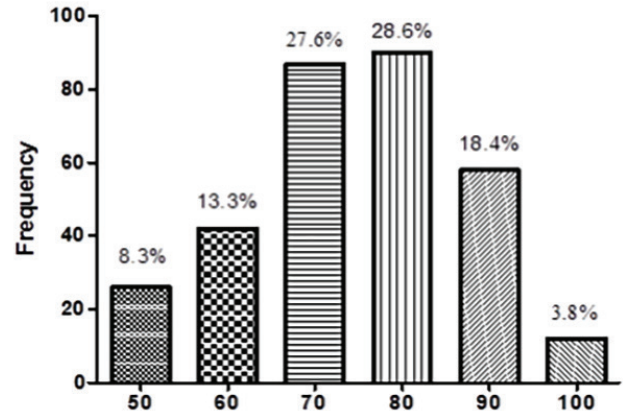
A total of 315 out of 385 registered patients were included in the study after careful evaluation for fulfilling the inclusion criteria. There were 38 (12.1%) females and 277 (87.9%) males. The average age was 37.26±10.14 years (range 18-65), for the females the mean age was 32.50±7.34 years and for the males the mean age was 37.91±10.31 years.

Present health as compared to one year previously as reported by the patients is graphically shown in Figure 1.



100%=much better, 75%=somewhat better, 50%=almost the same condition, 25%=somewhat worse, 0%=much worse

Figure 1 Health status of patients compared to previous one year (n=315)



100%=much better, 75%=somewhat better, 50%=almost the same condition, 25%=somewhat worse, 0%=much worse

Figure 2 Overall health rating on a scale 1-10 (n=315)

Overall, health rating on a scale 1-10

The numeric response to overall health rating on a scale 1-10 was multiplied by 10 to put the transformed score on a 0 to 100% scale[12]. The current health was reported as much better by 49 (15.6%) and somewhat better by 102 (32.4%) patients. The patients' responses to this question are shown in Figure 2.

Score analysis for gender

The unpaired t-test was used to compare the average scores of three domains between males and females. There was a highly significant difference in the average PCS score of males (45.25) and females (41.99) (p-value=0.001). Similarly, there was a significant difference in the MCS score of males (37.67) and females (39.31) (p-value=0.005), but no significant difference in the KDCS as shown in Table 1.

Score s analysis for employment status

Scores for the three domains of the KDQOL SF-1.3 questionnaire according to the employment status of the study population were analysed. There were no significant differences in the PCS (45.30 VS 44.51), MCS (38.04 VS 37.65), or KDCS (75.97 VS 76.52) scores of this study group. patients in both the employed and unemployed groups as shown in Table 2.

Score analysis for relation of recipient to the donor

The unpaired t-test was used to compare the mean scores between live related and live unrelated transplant recipients. In the PCS category, there was a significant difference in the living-related (44.01) and unrelated renal transplant recipients (45.45) at p-value=0.002. In the MCS and KDCS categories, there were no significant differences as shown in Table 3.

Score analysis for the duration of transplant

Analysis of variance (ANOVA) was used to compare the scores in the duration of transplant categories. For the PCS domain (p-value=0.956), MCS domain (p-value= 0.946), and KDCS (p-value=0.937) no significant differences were found as shown in Table 4.

Table 1 KDQOL SF-1.3 score analysis according to gender (n=315)

Domain	Gender	n	Mean	S.D.±	t	p-value
PCS	Female	38	41.99	6.41	-4.70	0.001 (**)
	Male	277	45.25	3.56		
MCS	Female	38	39.31	3.66	2.80	0.005 (*)
	Male	277	37.67	3.32		
KDCS	Female	38	76.75	5.45	0.50	0.615 (ns)
	Male	277	76.14	7.23		

PCS=physical component summary, MCS=mental component summary, KDCS=kidney disease component summary, S.D.=standard deviation
*statistically significant, **statistically highly significant, ns=statistically non-significant

Table 2 KDQOL SF-1.3 score analysis according to patient employment status (n=315)

Domain	Employment status	n	Mean	S.D.±	t	p-value
PCS	Un-employed	177	44.51	5.14	-1.67	0.09 (ns)
	Employed	138	45.30	2.24		
MCS	Un-employed	177	38.04	3.58	1.03	0.30 (ns)
	Employed	138	37.65	3.15		
KDCS	Un-employed	177	75.97	6.41	-0.69	0.48 (ns)
	Employed	138	76.52	7.785		

PCS=physical component summary, MCS=mental component summary, KDCS=kidney disease component summary, S.D.=standard deviation
ns=statistically non-significant

Table 3 KDQOL SF-1.3 score analysis according to the relation of with recipient with the donor (n=315)

Domain	Relation with the donor	n	Mean	S.D.±	t	p-value
PCS	Living-related	130	44.01	4.17	-3.064	0.002 (*)
	Living-unrelated	185	45.45	4.03		
MCS	Living-related	130	37.95	3.10	0.339	0.735 (ns)
	Living-unrelated	185	37.82	3.60		
KDCS	Living-related	130	76.92	7.77	1.494	0.136 (ns)
	Living-unrelated	185	75.72	6.45		

PCS=physical component summary, MCS=mental component summary, KDCS=kidney disease component summary, S.D.=standard deviation
*statistically significant, ns=statistically non-significant

Score analysis for age of the patient

The scores for categories of age were analysed by ANOVA. There was a statistically significant difference between the age categories in PCS (18–40 years –44.47, 41–60 years –45.83, more than 60 years –44.37 (p–value–0.031) and MCS (18–40 years –38.47, 41–60 years –36.48, more than 60 years –38.10 (p–value 0.001) but not in KDCS as shown in Table 5.

Score analysis according to the education level

In the MCS domain Matric and below (38.26), Intermediate and graduates (37.22) postgraduates & professional (38.04) statistically significant differences were found between the education level categories (p–value–0.05) but not in PCS or KDCS as shown in Table 6.

Table 4 KDQOL SF–1.3 score analysis according to duration of transplant (n=315)

Domain	Duration	n	Mean	S.D.±	F	p–value
PCS	4 month–1 year	44	44.93	1.94	0.110	0.956 (ns)
	>1–5 year	196	44.82	3.06	Equal variance by Welch	
	>5–10 year	45	44.68	8.49		
	>10 year	30	45.10	2.65		
MCS	4 month–1 year	44	37.80	3.91	0.125	0.946 (ns)
	>1–5 year	196	37.88	3.50	Equal variance by Levene	
	>5–10 year	45	37.87	2.66		
	>10 year	30	38.26	3.33		
KDCS	4 month–1 year	44	76.22	5.95	2.92	0.937 (ns)
	>1–5 year	196	75.66	7.44	Equal variance by Welch	
	>5–10 year	45	76.11	4.56		
	>10 year	30	79.71	8.03		

PCS=physical component summary, MCS=mental component summary, KDCS=kidney disease component summary, S.D.=standard deviation ns=statistically non–significant

Table 5 KDQOL SF–1.3 score analysis according to the age of the patients (n=315)

Domain	Age	n	Mean	S.D.±	F	p–value
PCS	18–40 year	215	44.47	3.60	3.52	0.031 (ns)
	41–60 year	88	45.83	5.30	Equal variances assumed by Levene	
	>60 year	12	44.37	2.18		
MCS	18–40 year	215	38.47	3.22	11.062	0.001 (**)
	41–60 year	88	36.48	3.67	Equal variances assumed by Levene	
	>60 year	12	38.10	2.34		
KDCS	18–40 year	215	76.16	5.95	0.716	0.496 (ns)
	41–60 year	88	76.04	7.49	Equal variance assumed by Welch	
	>60 year	12	77.88	4.56		

PCS=physical component summary, MCS=mental component summary, KDCS=kidney disease component summary, S.D.=standard deviation **statistically highly significant, ns=statistically non–significant

Table 6 KDQOL SF-1.3 score analysis according to the education level of patients (n=315)

Domain	Education	n	Mean	S.D.±	F	p-value
PCS	Matric & below	180	44.70	4.78	1.471	0.231 (ns)
	Inter & grad	101	45.35	2.07	Equal variances assumed by Levene	
	PGs & prof	34	44.07	4.95		
MCS	Matric & below	180	38.26	3.35	3.017	0.05 (*)
	Inter & grad	101	37.22	3.74	Equal variances assumed by Levene	
	PGs & prof	34	38.04	2.50		
KDCS	Matric & below	180	76.27	6.18	1.23	0.292 (ns)
	Inter & grad	101	75.54	8.34	Equal variance assumed by Levene	
	PGs & prof	34	77.71	7.05		

PCS=physical component summary, MCS=mental component summary, KDCS=kidney disease component summary, S.D.=standard deviation
*statistically significant, ns=statistically non-significant

Discussion

The WHO includes mental and social impacts of disease along with physical health to complete the total health evaluation horizon[1,2,12,14]. The mean scores of each domain will provide a basis for further studies. The results may prove helpful in comparing the HRQOL outcomes of the study patients with other transplant recipient cohorts and populations.

The majority (68%) of patients were in the prime social and economic productive years (18-40 years) of life. Even a younger average population age 33.99 (±7.45) was reported by another study examining HRQOL in transplant recipients[2]. The mean age of this study patients was close to the mean age reported by Ana Elza examining quality of life in tranplant recipents[16]. Studies from Europe, Turkey, Egypt, and Brazil have reported a higher mean age of cohorts of transplant recipients[11,15,16]. This can be partly explained by the fact that the development and progression of CKD to ESRD is early and rapid in Pakistan and India[5].

There was a significant difference in the PCS and MCS scores between age groups of this study.

Older age renal transplant recipients have been found to have lower HRQOL scores after transplant, a linear negative relationship between age and PCS scores reported[17]. A study by Ana Vanessa (WHOQOL-bref) and Rajesh Gautam (MOS SF36v3) did not report any differences in the PCS and MCS scores according to age[17,18]. Kjersti Lonning (KDQOL-SF-1.3) exclusively studied an elderly population with a mean age of 71.1 (±4.1) years one year after their transplant and reported improvements in the HRQOL with regard to PCS and KDCS[19].

In the present study, males were in majority [277 (87.9%)] compared to females [38 (12.1%)], and this trend has been similar all studies examining renal transplant recipients with varying proportions. The proportion of male patients varying from 52 to 74% and females varying from 26 to 49%[5,15]. In our study female transplant recipients were only 12.1% while living-related female donors were the majority 88 (67%) which reveals their contribution at the giving end.

The PCS score in males was significantly higher but the MCS score of females was significantly higher. Some studies have reported higher MCS and PCS scores in males[20]. Females and African American males were reported to score low as compared to white males[13]. In PCS, males have been reported to score significantly higher[11,14]. Higher MCS in females is partly reflected by the cultural values in our society. Women are allowed to be more emotionally expressive and dependent.

Education is one of the factors in a health system that allows health care recipients to get a better deal out of any health service as reflected in the fact that mean education of females was good as compared to males in this study[12,21]. This factor needs to be further explored using matched samples.

There were no statistically significant differences in the PCS, MCS, and KDCS scores of the employed and unemployed post-renal-transplant patients in this study. An interesting and encouraging observation was that patients who were educated less than 10 years formally were able to return or initiate work for living in 64 cases (n=180), although the majority (71%) stated that their health status interfered with their ability to work for a living. One study reported that after initiating HD for ESRD, up to 30% of the patients were able to return to work, as compared to 80% of patients after a renal transplant, who were able to return to work[12].

From 1980 to 2003, the employment rate of renal transplant recipients was reported from 18-80%[22]. Different studies have reported varying rates of employment of transplant recipients (25-60%)[11]. These differences in rates are partly explained by heterogeneous study populations concerning clinical and socio-demographic factors and how the investigators defined employment.

One review reported lower scores of HRQOL in unemployed renal transplant recipients[9]. Being employed exerts a positive influence on a patient's perception of their health. A patient feels more useful and independent which enhances his physical health scores[23]. In contrast, another study reported lower HRQOL scores in employed patients, the reasons to be explored further[11]. In another study, unemployed patients had lower HRQOL scores in physical function, general health, social function, vitality, pain, emotions, and mental health[24]. Being unemployed has been defined as a factor that affects HRQOL negatively[10].

Resuming or initiating work with a health condition requiring life-long care is a dynamic process affected by several interactions between personal, societal, work, and medical factors[30]. One study reported that rrenal transplant contributed to maintaining employment in 80% of those patients who were employed before the transplant. The same study reported that the self-reported health quality was a factor reported significant in deciding ability and capacity to return to work after a renal transplant[25].

In the rehabilitation of transplant recipients and counselling of pre-transplant patients about the possible prospective ability to work for a living, these findings are encouraging to support their efforts to return to work. One of the main concerns of those planning to undergo a renal transplant is their capacity to work for a living, as the majority are in their economically productive years.

In one study, a significant difference was found in the MCS domain in patients with higher education, similar to a review in those patients who had higher education[9]. The hypothesis behind higher education as a determinant of better HRQOL is explained by noting these individuals have a better chance of being employed and being a high earner[26]. A study by Bholke M, high income and being employed were associated with better MCS scores[11]. Educated transplant recipients had higher physical functioning, physical role and emotional role scores[11]. The patients who could not read and write (WHOQOL-bref) had lower scores in the psychological domain as compared to those who could read and write[26].

The importance of education in health gain and health utility as capital is pivotal. This predictive and independent nature of education in HRQOL in renal transplant recipients can help prospective renal transplant candidates to envision their expectations after transplant.

Groups of post-renal-transplant patients did not show any significant differences in the HRQOL scores with respect to duration of transplant in the three domains. In the first year after transplant, patients scored lower on WHOQOL questionnaire, attributed to frequent follow ups, treatment side effects and more risk of rejection in the

first-year post-transplant. After one year in the same study cohort there were no significant differences in the domains except general health perception[27].

Another research study showed better HRQOL scores in those with a transplant duration of less than 2 years. After 2 years, there was a decline in the HRQOL scores[9]. Another study reported (MOS SF-36) lower scores in all dimensions except bodily pain after 14 years of transplant as compared to the general population[35]. In another study, post-renal-transplant patients with transplant duration of less than 5 years had significantly lower WHOQOL-bref scores in the physical and psychological domains but with longer duration, they scored higher in the general health domain[28]. In another study, patients with an average transplant duration of 46.14 (±42.14) months, as the duration of transplant increased the vitality scores became lower[17]. In another study, patient's with a duration of 15 years or more after a transplant, had HRQOL scores comparable to a healthy population in the physical, social functioning, emotional and mental health roles, and lower scores in physical function, body pain, general health, and vitality[24].

In the PCS category in the same study, there was a significant difference in the living-related and unrelated renal transplant recipients. Transplant recipients are vulnerable and exploited at the hands of transplant touts in commercial living-unrelated cases. They are at the risk of receiving substandard care and poor follow up[24]. Cohorts of foreign nationals who received a living-unrelated transplant in Pakistan were followed in their countries and reported to have high complication rates and mortality[29,30]. No such data about the post-operative course of commercial renal transplants is available nationally.

Patients who received living-related renal transplant felt more guilt towards their donor and experienced clinically significant anxiety levels although other aspects of HRQOL were comparable[31]. In our study, living-related transplant recipients scored lower in PCS. The feeling of guilt is somatized into a physical component. The psychological response to transplant is complex and subtle cognitive, behavioral, and emotional changes occur. Renal transplant recipients, not preoccupied with donor-related guilt have a good chance of psychological recovery provided they survive the initial high rates of complications[32].

Limitations

This was a cross-sectional study of short duration which could not predict the possible trajectory of changes in the HRQOL. Due to the small number of female patients in the study population, the findings may not be generalizable. Lack of concurrent validity of the HRQOL tool is another limitation.

Conclusion

Female gender, live related donor, and variations in age were associated with lower physical HRQOL. Male gender, variations in age, and education were associated with lower mental HRQOL. Kidney disease symptoms were effectively relieved with respect to all variables with renal transplant. A lower MCS score is a good screening tool for further referral of a patient for mental health assessment. The encouragement of these patients to seek employment will give an economic advantage without impairing HRQOL. The exploration and management of these factors will help in the comprehensive rehabilitation of these patients which is the ultimate goal of organ transplantation.

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Conflict of interest

This was a self-funded study. The authors declare no conflicts of interest.

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