

Does Perceived Health Status Influence Quality of Life after Renal Transplantation

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Abstract Organ transplantation aims to restore physical health status and overall QoL. This longitudinal was carried out to find out how most renal transplant recipients (RTRs) in Pakistan, perceive their health status and overall QoL after a successful kidney transplant. Renal transplant recipients (RTRs) were studied at three waves over 15 months. QoL was assessed using Ferrens & Powers QoL Index- Kidney Transplant Version that evaluated four major domains of life post-transplant. These included; health functioning scale (HF), psychological and spiritual scale (PS), social and economic scale (SE) and family subscale (FS). Perceived Health Status was measured using a self-developed questionnaire assessing frequency and severity common immunosuppressant side effects. The findings revealed that most RTRs were satisfied with their QoL and had positive perceptions of their health status. A significant positive correlation among QoL and PHS was found. A cross lagged correlation analysis to find if perceived health status influences perceptions of QoL or vice versa showed that it cannot be claimed whether, QoL always influences how recipients perceive their health status due to an inconsistent pattern at wave 1 and 2 where the data suggest the relationship is working in the opposite direction.

Keywords: *perceived health status (PHS), quality of life (QoL), renal transplant recipients, longitudinal study, cross lagged correlation*

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1. Introduction

Transplantation is preferred over dialysis, because of its superior health outcomes. Recipients' physical health status is closer to pre-kidney failure levels, with good energy and ability to cope with routine chores (Fieberger, Mitterbauer, & Oberbauer 2004). Physical and perceived health status improves significantly after successful renal transplant as compared to dialysis (Dukes, Seelam, Lentine, Schnitzler and Neri 2013). Despite good/ normal graft functioning, recipients vary in their perceptions of health status (PHS). This may be due to sociodemographic differences in PHS (Bohlke, Marini, Rocha, Terhorst, and Gomes et al., 2009). There is variability in perceived health status (PHS) among RTRs resulting in differences in QoL satisfaction despite similar actual physical health status (Goetzmann, Saraca, Ambühl, Boehlerb, & Iranib, et al 2008). The experience of physical side effects influences their expectations about the transplant outcomes. Therefore, the present study assessed their self reports of symptom severity reflective of their PHS (Edgell, Coons, & Carter et al. 1996).

QoL is considered to be a multidimensional concept comprising of separate domains including physical, mental, social and economic components. The WHO defines it as an 'Individuals' perception of their position in life in the context of the culture and the value system in

which they live and in relation to their goals, expectations, standards and concerns' (WHOQOL, Measuring Quality of Life, 1998 p.1). QoL is a concept applied to the evaluation of health outcomes and treatment efficacy and also referred to as 'Health-Related Quality of Life (HRQoL)' (Joseph, Baines, Morris, & Jindal 2003). There are debates and controversies about the exact meaning of QoL. In the present study QoL is recipients' 'subjective QoL' i.e. their perception of and satisfaction with, their overall life after a renal transplant. Although most studies focus on the medical factors in evaluating QoL and health outcomes of transplant, there are a number of psychosocial aspects involved in this process. The factors associated with health related QoL (HRQOL) identified through a comprehensive analysis of sociodemographic and clinical variables among renal transplant recipients in France revealed that side effects, infectious disease, recent hospitalization and female gender were significant predictors of poor QoL (Gentile, Beauger, Speyer, Jouve, and Dussol et al 2013). The way transplantation is perceived encompassing the physical, medical, environmental/ social and psychological influences needs to be studied (Schleunigera, Schweglera, Buddeberga, & Klaghofer 2008). Recipients' perceptions of their physical well-being and functional ability are the main indicators of their subjective well-being and overall QoL (Kuyken, Orley, & Power et al. 1995). Health functioning constitutes a main domain and component of overall QoL. In the present study, recipients' physical health status was

measured by asking the frequency and severity of the common adverse side effects of mandatory immunosuppressants. High scores reflected a good perception of PHS whereas lower scores indicated a poor PHS. Most RTRs reported a positive perception of health status at all three waves of assessment. Since PHS is also considered a component of overall QoL (Caress, Luker, & Owens 2001), there is a conceptual issue if these are overlapping constructs i.e. overall QoL also includes health functioning so why and how perceptions of health status are measured as a separate construct. The purpose is to find if any causal relationships exist among QoL and PHS?. This would clarify if perceptions of health status influence satisfaction with overall QoL of recipients or vice versa or if these concepts are measuring the same thing.

1.1. Aims of the study

1. To explore how most recipients perceive their health status and overall QoL after successful renal transplant.

2. Is Perceived Health Status associated with QoL satisfaction?

To clarify the causal direction among Perceived Health Status and QoL.

2. Method

2.1. Study design

A longitudinal prospective cohort study was carried out investigating perceptions of health status and QoL among RTRs recruited from renal clinics in Lahore, Pakistan. A descriptive design was used to examine QoL over a period of 15 months. The sample size varied in all three points of assessment due to drop outs. At Wave 1, N = (150), Wave 2, N = (147) and Wave 3, N = (144). The mean age of recipients was 33.33 years (ranging from 18 to 54 years). These recipients had a post-transplant time ranging from 6 months to 10 years (Mean = 2.8 years, S.D = 1.5) and with normal graft functioning. The study got a favorable ethical opinion from University of Surrey ethics committee, U.K.

2.2. Participants and Recruitment

a) Inclusion criteria. Renal transplant recipients currently on a schedule of regular follow-up appointments; age 18 years onwards without any co-morbidity (existing physical or mental disorders); not more than one previous transplant, minimum basic formal schooling to equivalent of primary school level, and healthy graft functioning as indicated by follow up monitoring of renal function tests.

b) Exclusion criteria. Renal transplant recipients with medical co-morbidities or complications and/or psychological disorders; below the age of 18 years, illiterate recipients with no formal schooling; more than two kidney transplants in total, or any other co-existing transplant e.g., liver, heart or lung transplant along with a kidney transplant.

2.3. Measures

Demographic information collected included age, gender, marital status, years of formal education, employment status, household income and number of

dependents, familial background (rural/urban), and family systems i.e. joint or nuclear. Housewives and students were included in the unemployed category. Medical information collected included basic clinical information about approximate onset and duration of ESRD, dialysis modality (hemodialysis, peritoneal or both) before transplant and duration of dialysis, primary & secondary nephrologic diagnosis to reveal the etiology of renal failure, time since transplant, current medication (immunosuppressant group and dosage), complete blood profile with renal functions (including, serum creatinine, blood urea, uric acid).

Quality of Life Index (QoL Index) Kidney Transplant Version 111 (1998). The QoL Index developed by Ferrans & Powers (1984) consists of 35 items and measures both satisfaction and importance of various aspects of life. Importance ratings are used to weight the satisfaction responses, so that scores reflect the respondents' satisfaction with the aspects of life they value. The instrument consists of two parts: the first measures satisfaction with various aspects of life and the second measures their importance. Scores are calculated for overall QoL and four domains: health and functioning, psychological/ spiritual, social and economic, and family. Items that are rated as more important have a greater impact on scores than those of lesser importance. Satisfaction is rated from 1 = "very dissatisfied" to 6 = "very satisfied", and importance is rated from 1 = "very unimportant" to 6 = "very important." Scores are calculated by weighting each satisfaction response with its paired importance response (Ferrans, 1990; Ferrans, 1996; Ferrans & Powers, 1985, 1992; Warnecke, Ferrans, Johnson, & et al., 1996). In previous studies, internal consistency for the QoLI (total scale) was supported by Cronbach's alphas ranging from .73 to .99 (Ferrans & Powers, 1985).

Renal Transplant Side Effects Questionnaire for Perceive Health Status. Renal transplant recipients vary in experiencing disease specific physical and psychological impairments, sometimes attributed to the adverse side effects of immunosuppressants that are one of the main determinants of Perceived Health Status (PHS). The questionnaire is self-designed to measure the frequency and severity of most of the potential side effects of regular transplant medications that cause distress as perceived by renal transplants recipients. The scale measures severity of common side effects influencing physical functioning, role limitations due to physical problems, social functioning, and bodily pain, vitality, and general health perceptions. It involves a self-report by renal transplant recipients and separately by the medical professionals so that the responses can be compared. The questionnaire includes information on adherence which may directly influence health outcomes. A high score on this questionnaire reflects a positive perception of health status.

2.4. Procedure

This three-wave longitudinal study investigating perceptions of health status and QoL among RTRs was conducted over a period of 15 months, with a mean age of 33.33 years (ranging from 18 to 54 years). Three assessments comprised of an initial baseline evaluation (wave 1) followed by wave 2 assessment with an interval

of 6 months. Finally, wave 3 assessments were conducted with a gap of one year following wave 2 assessment. The recipients were recruited as referrals from physicians in renal out-patient units of private & government hospitals in Lahore (Pakistan). The assessments were conducted during their follow up sessions at the clinic individually.

2.5. Research Questions

1. How do renal transplant recipients perceive their health status and QoL?
2. Does Perceived Health Status influence QoL satisfaction among RTRs or vice versa?

3. Results

Most RTRs reflected a positive perception of their health status and overall QoL. The scores across three waves indicated a consistent pattern of scores over time.

Table 1. Descriptives of PHS & QoL at wave 1, 2 & 3

*PHS Scores	N	Means	Min	Max	S.D
Wave 1	146	9.78	19.00	7.00	3.51
Wave 2	147	8.61	21.00	6.00	2.94
Wave 3	144	0.84	22.00	8.00	3.64
QoL Scores	N	Means	Min	Max	S.D
Wave 1	150	23.71	12.08	35.00	3.45
Wave 2	147	23.74	16.41	29.00	2.62
Wave 3	144	24.98	17.50	29.31	2.35

* Perceived Health Status

The mean scores indicate that most RTRs reported a positive perception of their health status and QoL reflective of their satisfaction with the efficacy of transplantation. Most RTRs appeared to be satisfied in the four major domains of life as indicated by their respective scores on each subscale of QoL index.

Table 2. Scores on QoL Index subscales

QoL Subscales	N	Minimum	Maximum	Mean	S.D
*HF Wave 1	146	12.09	31.97	23.98	3.23
HF Wave 2	145	15.88	29.47	23.80	2.85
HF Wave 3	144	17.37	29.69	24.80	2.59
*FS Wave 1	146	17.10	30.50	27.03	3.31
FS Wave 2	147	16.50	30.00	25.96	3.35
FS Wave 3	144	18.00	31.67	27.08	3.14
*SE Wave 1	146	9.93	28.21	21.09	3.55
SE Wave 2	147	12.21	28.93	22.01	3.21
SE Wave 3	144	15.07	28.21	23.71	2.63
*PS Wave 1	146	13.94	18.00	16.52	.774
PS Wave 2	147	13.90	18.00	16.76	.710
PS Wave 3	144	15.26	18.00	17.04	.608

*HF (Health Functioning), *FS (Family subscale),

*SE (Social & Economic), *PS (Psychological & Spiritual)

The sub-scale scores are not comparable in the sense that they all don't have the same number of items and same max possible score. So the mean scores cannot be considered to reflect which domain is most satisfactory than others. Significant positive correlations were found

among PHS and QoL across 3 waves, showing a consistent pattern over time.

Table 3. Correlations among *Perceived Health Status and QoL

	*PHS Wave-1	PHS Wave-2	PHS Wave-3
QoL Wave-1	.423**	.134	.173*
QoL Wave-2	.187*	.370**	.189*
QoL Wave-3	.141	.105	.331**
PHS Wave-1		.380**	.410**
PHS Wave-2			.386**

** p< .001, * p< .005

The positive correlations among PHS and QoL indicate that recipients with a good perception of health tend to be more satisfied with their QoL at most times. These significant associations do not clarify causation. For example, whether recipients with a positive perception of health status are more satisfied with their QoL or QoL satisfaction influences their PHS.

Since health status is also evaluated as a part of overall QoL as measured by the Health Functioning (HF) subscale of QoL Index, therefore, associations were analyzed among PHS as reflected by their scores on side effects questionnaire and health functioning subscales.

Table 4. Correlations among Health Functioning Subscale and Perceived Health Status

QoL Subscales	PHS W-1	PHS W2	PHS W_3
HF Wave-1	.445**	.274**	.249**
HF Wave-2		.395**	.302**
HF Wave-3			.396**

** p< .001

Significant positive correlations were found among satisfaction with health functioning and PHS at all three waves, suggesting that recipients with less symptoms of immunosuppressants tend to be more satisfied with their QoL. The findings indicate that both constructs are closely associated i.e. the experience of symptom frequency and severity does influence satisfaction with physical health functioning and contributes towards perceived QoL.

To examine causal directions among these variables a regression analysis was carried out to look at the causal relationships to find predictor and outcome variables.

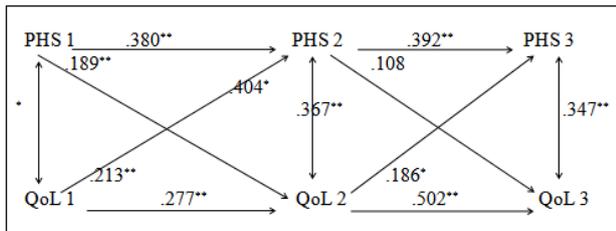
Table 5. Regression Analysis of PHS as Predictor of QoL

Predictors	β	t	Sig
PHS Wave 1	.503	6.783	.000
PHS Wave 2	.293	3.681	.000
PHS Wave 3	.331	4.175	.000

Dependent Variable: QoL wave 1, 2 & 3

Both PHS and QoL appeared to be significant predictors with a consistent pattern over time. Wave 1 ($F(1, 136) = 46.012$, $Adj R^2 = .247$, $P = .000$, Wave 2 ($F(1, 144) = 13.547$, $Adj R^2 = .080$, $P = .000$ and Wave 3 ($F(1, 142) = 17.431$, $Adj R^2 = .080$, $P = .000$), making it unclear to determine cause and effect relationships.

Therefore, a cross lagged correlation was carried out to clarify causal priorities and find out whether recipients' perceptions of health status makes them less satisfied with their QoL or its their QoL that influences their health perceptions.

Table 6. Cross Lagged Correlations among PHS & QoL

The CLCs showed no significant difference among QoL and PHS correlations at wave 1 and 2 ($z = -1.73$, $p = 0.08$) however, when QoL and PHS at wave 2 and 3 were analyzed, the results showed a significant difference in the opposite direction ($z = 2.33$, $p = 0.01$) indicating that the correlation between QoL-2 and PHS-3 is stronger than the relationship between PHS-2 and QoL-3. This indicates that RTRs more satisfied with their QoL tend to have a better perception of their health. However, we cannot claim whether, QoL always influences how recipients perceive their health status due to an inconsistent pattern at wave 1 and 2 where the data suggest the relationship is working in the opposite direction.

4. Discussion

Recipients' perceptions of their physical well-being and functional ability are the main indicators of their subjective well-being (Akinlolu, Hanson, Wolfe, Leichtman, and Lawrence et al 2000). Health functioning constitutes a main domain and component of overall QoL (Overbeck, Bartels, Decker, Harms, Hauss, and Fangmann 2005). Since perceived health status (PHS) is a subjective construct, and two individuals with similar physical health conditions can report different levels of satisfaction with their health and life in general, therefore, it is important to identify the socio-demographic differences in PHS among RTRs. In the present study, recipients' physical health status was measured by asking the frequency and severity of the common adverse side effects of mandatory immunosuppressants. High scores reflected a good perception of PHS whereas lower scores indicated a poor PHS. Most RTRs reported a positive perception of health status at all three waves of assessment. Studies have reported that medication adherence is also positively associated with perceptions of health status. Recipients with increased medication adherence tend to have better PHS (Gremigni, Bacchi, Turrini, & Cappelli, et al 2007).

The analysis of relationships and causal priorities clarified the subjective nature of QoL and showed an overlap with psychological constructs and terms used interchangeably in research (Rosenberger et al 2005), such as 'Health-related QoL', 'Health Status' 'Health Perceptions' etc. This study has provided an understanding about the complex and confusing nature of the QoL concept and shown that most psychosocial aspects are already encompassed in this broad and multidimensional concept. Different versions and concepts of QoL emerge mainly because of the differences in the population being studied. It depends on 'who is being asked and when' as most people do not evaluate their lives unless they are asked to do it.

Significant associations were found among overall QoL and PHS, further relationships were explored among health functioning subscale of QoL that measured routine physical functioning and satisfaction with transplanted kidney and the experience of immunosuppressant side effect severity and frequency. The experience of adverse physical side effects is one of the major stressors of life post transplant (Chang & Tzou 2001) that influences perceived QoL (Frey 1990). Most reported stressors after renal transplant include fear and anxiety related to graft rejection, medication side effects consequently influencing psychological well-being of the recipient (Chen, Weng & Sheuan 2009). The aim was to find how satisfaction with physical health functioning is related to the experience of physical symptoms constituting perceived health status. The health functioning subscale of QoL index, were looked for associations with perceived health status to find if both end up measuring the same construct referred to as 'subjective QoL' and the findings also revealed an overlap between these constructs. This study also contributed towards measurement of QoL and PHS in an Asian culture, since cultural diversity in perceptions of QoL after transplant also needs to be a focus of health outcomes.

5. Future Implications & Recommendations

The findings of this longitudinal study provide the ground work for future research on psychological aspects, particularly recipients' perceptions of health status influencing QoL after transplantation. Most research focuses on health outcomes of kidney transplantation without linking the role of environmental, demographic and psychological/ personality factors in and cultural diversity modifying these outcomes (Warnecke, Ferrans, Johnson et al. 1996).

6. Conclusion

The present study attempts to clarify relationships between perceived health status and QoL which appears to be very closely associated and overlapping constructs. Most recipients with a good graft functioning and normal general health reported a positive perception of health status as reflected by minimal immunosuppressant side effects and a satisfied QoL reflecting transplant efficacy in a developing country where people live with issues of affordability and availability of quality health care without any support by the government.

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