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Does conscientiousness increase quality of life among renal transplant recipients?

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Abstract

A longitudinal study comprising of renal transplant recipients (RTRs) was carried out in Lahore, Pakistan across 15 months. The recipients with healthy graft functioning were recruited from government and private renal clinics and assessed at three times. The aim was to investigate if conscientiousness as a personality trait influences their satisfaction with quality of life (QoL). Conscientiousness is mostly associated with health behaviors and in particular adherence. An improved QoL is associated with self-care, health behaviors and medication adherence post-transplant. However, there is little research evidence about the role of personality traits in health related behaviors and QoL in transplant population. The study found most recipients to be conscientious with a consistent pattern of conscientiousness across three waves, confirming its stability as an enduring personality trait. Regression analysis indicated that except wave 1, conscientiousness appeared to be a significant predictor of QoL satisfaction at wave 2 & 3, suggesting a contribution of this personality trait in increasing QoL satisfaction among RTRs. The findings suggest that conscientiousness influences QoL, reflecting a positive contribution of this personality trait in influencing subjective well-being and overall QoL.

Keywords: Quality of Life (QoL); life satisfaction; Renal Transplant Recipients (RTRs); personality; conscientiousness; transplantation; kidney transplant; longitudinal study

Does conscientiousness increase quality of life among renal transplant recipients?

1. Introduction

Organ transplantation is a life threatening major surgical procedure that influences an individual's physical health status and psychological well-being. Studies have been investigating the role of clinical, environmental and psychosocial factors in affecting health behaviors. Health outcomes are a focus of research in transplantation. However, limited research focuses personality traits influencing the psychological consequences (e.g. subjective well-being) and health promoting behaviors after transplantation. Recipients live with altered physical conditions and life styles on a life- long basis after transplant. Erlen et al. (2009) suggests associations between personality characteristics and health, focusing on ways in which personality plays a role in the predisposition for and outcome of physical as well as psychiatric illness. It has been found that personality traits underlie stable patterns of emotional and behavioral function that affect risk of developing chronic illnesses and the ways in which individuals perceive health and manage symptoms and treatment regimens, thereby, affecting outcomes (Aldwin, Spiro, Levenson, & Cupertino, 2001). Understanding this mind-body relationship facilitates the promotion and maintenance of health and health-promoting lifestyles to adapt positively with a chronic condition and reduce disease progression. Christensen et al. (2002) argued that the five-factor model of personality is an appropriate framework for examining personality traits among cohorts of patients with both chronic medical and psychiatric disorders.

It is important to investigate what personality traits have a significant impact on modifying subjective well-being after transplant, to identify vulnerable and high risk individuals and provide psychological intervention for improved Quality of life (QoL). Kidney transplants are the most commonly performed organ transplant with a high success rate and newer developments that have increased the survival rates (Fieberger, Mitterbauer, & Oberbauer 2004). The loss and re-gain of a kidney implicates psychological, clinical and environmental factors. How this surgical procedure is experienced and perceived by each recipient varies depending on the different socio-demographic, clinical and psychological factors such as personality and life orientations. Therefore, understanding this mind-body relationship highlights the significance of health behaviors, in particular mediation adherence to manage symptoms and disease progression.

Furthermore, Stilley et al. (2005) argues that personality characteristics are clinically believed to predict post-transplant adherence and outcome; however, there is little data on the distribution of personality traits among transplant populations, are sparse and inconclusive. A wide variability in traits among heart and lung recipients was found that suggests considerations of personality characteristics when planning interventions to increase compliance and maximize QoL after cardiothoracic transplantation (Stilley et al., 2005).

"Personality traits are enduring patterns of perceiving, relating to, and thinking about oneself and the environment that are exhibited in a wide range of social and personal contexts" (American Psychiatric Association, 1994, p. 630). Erlen et al. (2011) has found that extensive factor analytic research in psychiatric and community populations has produced the five-factor model of personality. According to, this model the basic dimensions of personality are represented by five traits: (a) neuroticism contrasts emotional stability and adjustment with instability and maladjustment; (b) extraversion contrasts sociability with preference for solitude; (c) openness contrasts the curious, imaginative with the conservative, conventional individual; (d) agreeableness is a dimension of tendencies toward altruism and cooperativeness versus egocentricity and competition; and (e) conscientiousness represents a continuum of goal-oriented vs. impulsive, tangential patterns of behavior. It is reported that the most salient personality traits in behavioral medicine and health psychology research have been neuroticism and conscientiousness (Costa & McCrae, 1992).

Conscientiousness refers to traits such as reliability, perseverance, and self-discipline (Digman, 1990;

McCrae & Costa, 1987), and research confirms that it is an important predictor of health behaviors. In cross-sectional studies, conscientiousness has been associated with a wide range of behaviors (Booth-Kewley & Vickers, 1994 ; Castle, Skinner, & Hampson, 1999 ; Cox, Borger, Asmundson, & Taylor, 2000 ; Ingledew & Brunning, 1999 ; Lemos-Giraldez & Fidalgo-Aliste, 1997 ; Vollrath, Knoch, & Cassano, 1999). Significant relationships were found between high levels of neuroticism and low levels of conscientiousness and mortality in cohorts of patients with renal disease (Christensen et al., 2002) and diabetics (Brickman, Yount, Blaney, Rothberg, & De-Nour, 1996). In the context of transplantation, conscientiousness is implicated as a personality trait that may influence compliance and health promoting behaviors.

Horsburgh, et al (1999) found that high neuroticism and low extraversion explained approximately 20% of the variance in self-care among patients with end stage renal disease. Conscientiousness was found to be the strongest predictor of self- care agency according to Orem's self-care deficit theory of nursing (Horsburgh, Beanlands, Locking-Cusolitto, Howe, & Watson, 2000). There is little published work on links between socio-demographic variables and personality traits (Bozionelos, 2004), particularly among individuals with organ transplant and chronic conditions. Erlen et al. (2011) argued that personality traits not only underlie patterns of behavior that increase risk of acquiring acute or chronic illness but may also affect the self-management and the course of the disease. This suggests that the personality traits and attitudes of transplant population affect consequent health behaviors.

Goetzmann et al. (2012) studied the attitudes of transplant recipients and their spouses towards the transplant and the medication as well as towards the effects of the transplant on their perceived self and their perceived fate. In transplantation medicine, the knowledge of whether attitudes towards the transplantation experience influence the patient's intentions to follow the doctor's recommendations or the patient's adherence behavior may be relevant. Until today, however, no comprehensive measure of attitudes toward transplantation for patients and their spouses exists (Goetzmann, Scholz, Dux, Roellin, & Boehler et al 2012). Besides that, the contribution of personality traits, particularly conscientiousness in influencing perceived QoL after renal transplant is not studied longitudinally. The present study assessed the influence of consciousness on QoL satisfaction among renal transplant recipients (RTRs) in Pakistan across 15 months.

The study aimed to investigate if conscientiousness affects perceived QoL among RTRs and the impact of socio-demographic factors in affecting conscientiousness across three waves.

1.1 Research Questions

- Do Conscientious renal transplant recipients (RTRs) report a better QoL?
- Do demographic factors influence conscientiousness among RTRs?

2. Methodology

2.1 Study design

A longitudinal prospective cohort study was carried out investigating demographic differences in conscientiousness and how it affects perceptions of QoL among RTRs recruited from renal clinics in Lahore, Pakistan. A descriptive design was used to examine QoL over a period of 15 months.

2.2 Participants & Recruitment

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). 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.

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.

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.

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).

2.3 Quality of Life Index Kidney Transplant Version 111 (1998)

The QoL Index developed by Ferrens & 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).

2.4 The Conscientiousness Scale

This is a 9-item scale taken from the Big Five Inventory (Benet-Martinez, & John, 1998). The aim was to assess if conscientious RTRs tend to report increased QoL. The response scale is 1 = disagree strongly, 2 = disagree a little, 3 = neither agree nor disagree, 4 = agree a little, 5 = agree strongly. It is scored by adding up the ratings (after reversing where indicated) and dividing by the number of items responded to (i.e., the mean rating). Previous studies have reported coefficient alphas ranging from .75-.90, and test-retest correlations of .70-.80 (John, Naumann, & Soto, 2008).

2.5 Procedure

This three-wave longitudinal study investigated perceived QoL was conducted over a period of 15 months, comprising of RTRs 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 and government hospitals in Lahore (Pakistan). The assessments were conducted during their follow up sessions at the clinic individually.

3. Results

3.1 Conscientiousness & QoL

This three-wave longitudinal studied the impact of conscientiousness on perceived QoL, demographic differences in conscientiousness and if there are any inconsistencies in this personality trait at any time of assessment.

Table 1

Descriptive Conscientiousness Wave 1, 2 & 3

Conscientiousness	N	Means	S.D	Minimum	Maximum
Wave 1	143	30.32	2.64	23.00	37.00
Wave 2	147	31.87	4.25	19.00	39.00
Wave 3	144	31.58	3.33	22.00	39.00

Except for wave 1, conscientiousness was found to be positively associated with QoL, reflecting that more conscientious recipients tend to report increase life satisfaction. (See table 2)

Table 2

Correlations among Conscientiousness & QoL

QoL Scores	Conscientiousness Wave-1	Conscientiousness Wave-2	Conscientiousness Wave-3
QoL Wave 1	.043	.142	.010
QoL Wave 2		.234**	.227**
QoL Wave 3			.168*

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

In order to find if conscientiousness affects the life satisfaction of recipients, a linear regression showed that except wave 1, conscientiousness appeared to be a significant predictor of QoL at wave 2 & 3, suggesting that more conscientious RTRs tend to report increased QoL satisfaction overall.

Table 3

Conscientiousness as predictor of QoL

Conscientiousness	β	t	Sig
Wave 1	.081	.963	.337
Wave 2	.273	3.374	.001
Wave 3	.194	2.352	.020

Note. Dependent Variable: QoL

The results showed that conscientiousness did not predict QoL at wave-1: $F(1,140) = .926$, $p = .337$, Adj.$R^2 = .001$, $\beta = .081$, $t = .963$. However, at wave 2, $F(1,141) = 11.386$, $P = .001$, Adj. $R2 = .068$, $\beta = .273$, $t = 3.374$ and wave 3, $F(1,142) = 5.530$, Adj.$R^2 = .031$, $P = .020$, $\beta = .194$, $t = 2.352$, conscientiousness significantly predicted QoL.

3.2 Conscientiousness & Demographic Factors

The study analyzed individual differences in conscientiousness as a consequence of diverse demographic backgrounds.

Age & Conscientiousness:

A significant negative correlation is found among conscientiousness at wave-1 and age at wave-1, 2 & 3, r = -.190, p =<.005, wave 2, r = -.185 p =< .005, and wave 3, r = -.173, p < .005, indicating that conscientiousness decreases with increasing age. Older recipients tend to be less conscientious than young ones. A further examination of age groups and conscientiousness is carried out.

Table 4

ANOVA for Age groups and Conscientiousness

CS	Age groups	N	Means	S.D	F	Sig.	η^2
Wave 1	< 25 years	10	29.50	3.37	F (3, 139) = 5.065	.002	.099
	26-35 years	74	30.66	2.45			
	36-45 years	50	30.52	2.56			
	46 years & above	9	27.33	1.87			
	Total	143	30.32	2.64			
Wave 2	< 25 years	10	28.55	3.91	F (3, 140) = 3.300	.022	.066
	26-35 years	74	32.21	3.80			
	36-45 years	52	32.50	4.75			
	46 years & above	8	29.86	3.26			
	Total	144	31.93	4.25			
Wave 3	< 25 years	10	30.30	4.76	F (3, 137) =1.306	.275	.028
	26-35 years	71	31.38	3.17			
	36-45 years	52	32.21	2.83			
	46 years & above	8	30.87	5.56			
	Total	141	31.58	3.35			

The ANOVA table shows significant differences in conscientiousness among different age groups, but the small effect size indicates that age does not account totally for this difference again suggesting a lack of relationship between age and conscientiousness.

Gender differences in Conscientiousness:

Significant gender differences were found among RTRs at wave 2 & 3, indicating that males are more conscientious as compared to female recipients.

Table 5

Gender differences in Conscientiousness at wave 1, 2 & 3

CS Scores	Gender	N	Means	S.D	t	df	Sig	d	r
Wave 1	Male	96	30.27	2.55	-.328	141	.743	-0.05	0.02
	Female	48	30.42	2.83					
Wave 2	Male	99	32.40	3.45	2.210	145	.029	0.36	0.18
	Female	48	30.77	5.43					
Wave 3	Male	96	32.17	3.24	3.109	142	.002	0.52	0.25
	Female	48	30.39	3.22					

Note. Dependent variable: Conscientiousness

Although males appeared to be more conscientious as compared to female RTRs, however, due to the small effect size, it can't be claimed that this difference in conscientiousness is only attributed to gender.

Marital status and Conscientiousness:

It was studied if recipients' marital status influenced their conscientiousness. Recipients currently 'in a relationship' did not differ in conscientiousness than those who were single (never married, separated, divorced and widow).

Table 6

Marital Status and Conscientiousness

CS	Marital Status	N	Means	S.D	t	df	Sig	d	r
Wave 1	In a relationship	68	29.82	2.70	-1.900	139	.060	- 0.31	-0.15
	Single	73	30.64	2.42					
Wave 2	In a relationship	80	32.41	4.46	1.691	145	.093	0.28	0.13
	Single	67	31.23	3.93					
Wave 3	In a relationship	77	32.09	3.11	1.976	142	.050	0.33	0.16
	Single	67	31.00	3.50					

Note. Dependent variable: Conscientiousness

The results showed that conscientiousness did not differ among recipients' who were single from those 'in a relationship' at any Wave of assessment, suggesting that marital status does not influence the personality trait of conscientiousness. The present study had a low representation of divorced, widowed and separated recipients, so they were grouped together as 'single'. An equal number of participants in each category of marital status could have clarified if differences in this personality trait existed in RTRs.

Education and Conscientiousness:

No association was found between education and conscientiousness. A lack of correlation in conscientiousness and educational level (wave 1 r = .67, p = .433, wave 2 r = .050, p = .562 and wave 3 r = .043, p = .619) suggested that educational level does not affect conscientiousness at any Wave.

Employment status and Conscientiousness:

The study explored whether there are differences in conscientiousness of working vs. non-working RTRs (e.g. house wives, retired officers and students). However, conscientiousness did not differ among these two groups of recipients at any time.

Table 7

*Employment Status & *Conscientiousness*

*CS Scores	Work Status	N	Means	S.D	T	Sig.	d	r
Wave 1	Working	91	30.23	2.56	-.543	.588	-0.09	-0.04
	not-working	52	30.48	2.78				
Wave 2	Working	106	32.83	3.60	4.699	.000	0.87	0.39
	not-working	41	29.39	4.83				
Wave 3	Working	93	32.18	2.92	2.990	.003	0.52	0.25
	not-working	51	30.49	3.77				

Note. Dependent variable: Conscientiousness

The above table shows that no significant differences in were found among recipients based on their work status, indicating that conscientiousness did not differ among working and non-working recipients.

4. Discussion

The Five-Factor theory of personality is the product of over four decades of factor analytic research in

psychiatric and normal populations; it proposes that the basic dimensions of personality are represented by five traits (neuroticism, extraversion, openness, agreeableness and conscientiousness).The most salient personality traits in health psychology research have been neuroticism and conscientiousness. While personality is rarely assessed prior to transplantation nor has it been considered a selection criterion, the personality characteristics of cardiothoracic transplant recipients are consistent with better adherence to treatment regimens in other samples which likely predicts longer survival to transplant and better health outcomes (Stilley et al., 2005). This is crucial because medication non-adherence as a result of lack of self-efficacy and self-discipline may harm transplant outcome. Despite a significant link between patients' personality and illness perceptions, there is limited evidence on this relationship. Goetzmann et al (2005) found that lung transplant recipients scored higher on 'extraversion' ($p < .001$), 'agreeableness' ($p < .035$) and 'conscientiousness' ($p < .001$) than normal population (healthy controls), suggesting that personality traits are more relevant to illness perceptions of 'control' than current graft function (Goetzmann et al., 2005).

Psychological and behavioral correlates of health and illness implicate a variety of psychological and behavioral factors that may contribute to the health or illness- status. These variables may include; health beliefs and perceptions, health behaviors / lifestyles / habits and individual differences (including the genetic makeup, physiological conditions, personality type etc. Health locus of control and indulgence in health promoting behaviors are associated with personality characteristics (Helgeson1992). Demographic factors have also been found to influence health and illness, for example age, socioeconomic class, occupation, or cultural background of an individual (Taffa & Chepngeno, 2005). It is important to see how socio-demographics influence an individual's personality and ultimately affect illness perceptions and health-behaviors.

In the past, studies of personality in general medicine failed to demonstrate relationships among personality, adherence and health outcomes due to lack of a conceptual model. However, recently, researchers suggest that the Five-Factor model provides a valuable framework for investigating and understanding linkages between personality and health in general medicine, including patients with end-stage organ disease (Stilley, Dew, Pilkonis, Bender, & McNulty 2005). However, research examining the main effects of health beliefs and personality on medical regimen adherence has found inconsistent results. A study tested if health beliefs and personality predict adherence in an interactive manner. Research examining the main effects of health beliefs and personality on medical regimen adherence has yielded inconsistent results.

Wiebe and Christensen (1997) studied the components of the Health Beliefs Model, conscientiousness from the NEO-Five Factor Inventory, and assessed adherence in hemodialysis patients. In a hierarchical regression analysis, the interaction of health beliefs and conscientiousness failed to explain a significant portion of the variance in interdialysis weight gain, a measure of adherence to fluid restrictions, after controlling for demographic characteristics, suggesting that health beliefs and conscientiousness do not influence medical adherence. They found that the interaction among these variables significantly predicted medication adherence. Such a pattern may be the result of defective coping patterns associated with high levels of anxious arousal and has implications for therapeutic interventions targeted at modifying health beliefs among chronically ill patients following prescribed medical regimens.

A study compared 3 models of association between personality, personal model beliefs, and self-care in a cross-sectional design. It was found that both emotional stability and conscientiousness determine self-care indirectly through personal model beliefs (Skinner, Hampson & Fife-Schaw 2002). However, instead of analyzing the relationship between health beliefs and conscientiousness, an indirect approach was used to study the impact of conscientiousness on overall QoL after transplant.

The extent and causal direction of relationships between personality traits and QoL after transplant needs to be studied extensively to clarify the exact nature of this relationship. Conscientiousness has been considered as a predictor of longevity (Kern & Friedman, 2008). A meta-analysis of conscientiousness-related traits and the leading behavioral contributors to mortality revealed conscientiousness-related traits to be negatively related to

all risky health-related behaviors and positively related to all beneficial health-related behaviors. The findings confirmed the importance of conscientiousness' contribution to the health process through its relationship to health-related behaviors (Bogg & Roberts 2004).

5. Conclusion & Clinical Implications

The role of personality traits in influencing health outcomes is extensively studied, but limited evidence in transplant population. How recipients personality traits influence their adjustment post-transplant needs to be explored in order to identify traits that facilitate and improve coping and adjustment along with those traits that may increase vulnerability to stress and result in poor health outcomes. Perceptions of physical health status comprise a significant part of subjective QoL and can influence it either way despite similar physical health status. The goal of transplantation is not only improving quantity but also quality of life that implicates recipients' psychological well-being and personality as an integral part. Future studies can explore the impact of all big five personality traits in transplant recipients and consequent perceptions of QoL to identify vulnerable groups. Personality assessment needs to be a part of pre-transplant evaluation to cater for individual needs of recipients requiring psychological counseling to promote health related behaviors post-transplant.

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