

Resilience and Posttraumatic Growth in Renal Transplant Recipients

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The study examined the impact of resilience on posttraumatic growth (PTG) after a successful renal transplant. The contribution of clinical and socio-demographic correlates influencing PTG was investigated using a cross-sectional research design. A purposive sample of 113 male and 23 female renal transplant recipients (RTRs) were recruited from government and private hospitals of Lahore and were assessed with Urdu versions of Connor Davidson Resilience Scale (CD-RISC) developed by Connor and Davidson (2003) and posttraumatic growth inventory (PTGI) developed by Tedeschi and Calhoun (1996). The findings revealed that resilience significantly predicted PTG, along with educational levels and current employment. Cholesterol level was the only factor that influenced PTG in clinical conditions.

Keywords: posttraumatic growth, resilience, renal transplant recipients¹

Patients suffering from end-stage renal disease (ESRD) need renal replacement therapies to keep the function of the kidneys (Ardalan, Etemadi, Ghabili, Ghajzadeh & Ghafari, 2011; Cleary & Drennan, 2005). Renal transplants (RTx) are superior to long-term hemodialysis in reducing chronic morbidities, extending life over decades (Martz, & Stablein, 2008), and improving quality of life (QoL) for many adults with chronic kidney failure (Son, Choi, Park, Bae & Lee, 2008).

Besides the positive aspects of renal transplant and the subsequent postoperative life, renal transplant recipients (RTRs) still experience a multitude of physiological and psychosocial stressors and complications which incorporate such as a strict regimen of immunosuppressive drugs and its related side effects, frequent medical visits, infections, the uncertainty and anxiety concerning rejection episodes and potential loss of

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the graft (Alavi, Aliakbarzadeh & Sharifi, 2009; Baguelin-Pinaud et al., 2009; Prihodova et al., 2010). Such postoperative challenges stress the patients, including uncertainty about future health, costs and finances, side effects of medicinal treatment, and medical follow-up; these factors can lead to low QoL (Achille et al., 2004).

Gill (2012) pointed outpatients have concerns over transplant outcomes, which adds to the list of other stressors and plagues patients for years with uncertainty about future physical and physiological health. These stressors include fear of graft rejection and hopelessness (Chen, Weng & Lee, 2010). Therefore RTx is a life trauma that creates intense stress during the pre and post-transplant period and threatens the physical and psychological integrity of the recipient disrupting harmony. Also, RTx is described as a mortal, painful, intimidating, and scary surgery, which brushes the recipient with mortality and can in some cases cause death. Facing the reality of death gives patients new meaning to life and questions the importance of life's routines, habits, and values (Hallaç & Öz, 2011; Karancı & Erkam, 2007). Adverse experiences like renal failure with RTx are traumatic events but they are also harbingers of positive change (Helgeson, Reynolds, & Tomich, 2006) inpatient life referred to here as posttraumatic growth (PTG). For this study the authors investigated postoperative personal growth in ESRD patients termed as PTG (see Kamran & Ogden, 2016; Látos et al., 2015); and have studied the process of positive adaptation termed as resilience (Bonanno, 2004). Personal attributes in maintaining psychological wellbeing during adverse and threatened life are explained by these constructs (APA, 2010; Southwick & Charney, 2012). Resilience as a transformative process is described by three different but interrelated dimensions known as recovery, resistance, and reconfiguration, where reconfiguration process is termed as PTG, solely associated with the transitions that are positive (Lepore & Revenson, 2006); thus PTG is a subset of resilience (Calhoun & Tedeschi, 2004). The current study explores this positive psychological outcome in RTRs, an overlooked population with life threatening disability in Pakistan.

Rationale and Research Questions

Psychological adjustments after sudden or lifelong stressful situations are better in resilient individuals (Campbell-Sills, Cohan & Stein, 2006; Hjemdal, Friborg, Stiles, Rosenvinge & Martinussen, 2006; Mancini & Bonanno, 2006; Simpson & Jones, 2013) because they adjust to psychological suffering after facing stress or pain (Southwick, Vythilingam & Charney, 2005; Hoge, Austin & Pollack, 2007). RTx is a traumatic event, resilience, and PTG in response to transplants needs to be

elucidated and the association between them needs to be clarified. This study examines resilience and PTG after a successful renal transplant and investigates the relative contribution of clinical, medical, and socio-demographic factors in influencing PTG. The study specifically poses two questions, i.e. after successful renal transplant how did resilience and PTG increase in recipients? And, how did PTG predicted clinical, medical, and socio-demographic factors in these patients?

Method

Participants

A cross-sectional research study with 113 males and 23 females with RTRs was carried out over a period of 9 months between Jan-Sep 2016. Patients ranged in age from 19 to 66 ($M = 38.50$, $SD = 12.35$) years, and were recruited through referrals by the doctor in-charge of outpatient wards (OPD) of renal units in different government hospitals and heads in-charge at private hospitals in Lahore. Recipients were screened for research suitability by the referring physician and researcher and included those RTRs who, (a) had a healthy functioning graft without any medical comorbidity, receiving follow-up care, (b) were 18 years and above, (c) had a formal education at least to the school level. Recipients with or any serious cognitive and communication deficits, having any other organ transplant, below 18 years, or unable to read and write were excluded from the study.

Instruments

Connor Davidson Resilience Scale (CD-RISC). Resilience was measured by an Urdu version (Sajida Naz, 2011) of CD-RISC originally developed by Connor and Davidson (2003). The CD-RISC differentiates between individuals with greater or lesser resiliency (Connor & Davidson, 2003) and has been validated in multiple settings (Green, Hayward & Williams, 2014; Jowkar, Friborg & Hjemdal, 2010). The scale consists of 25 items, where each item is measured on a 5-point scale Likert-type scale that goes from strongly agree (4) to strongly disagree (0), where composite scores could range from 0 to 100; higher scores representing higher resilience. Studies have confirmed excellent psychometric characteristics (Cronbach's $\alpha=0.82-0.91$) (Zhou, & Li, 2019), and in this study, the Cronbach's alpha coefficient was 0.89.

Posttraumatic Growth Inventory (PTGI). An Urdu version adapted by Saghir & Kausar (2007) (Name the authors that adapted the scale into Urdu) of PTGI was originally developed by Tedeschi and Calhoun (1996). The inventory consists of 21-items to be responded on a 6-point Likert scale (0 as "no change" and 5 as "a great deal of change").

The range of composite scores range between 0 and 105; where higher scores represent higher levels of PTG that reflect positive changes experienced after major life stressors. There are three subscales in PTGI and include "changes in the relationship with others", "changes in the philosophy of life", and "changes in self-perception" (Tedeschi, Park & Calhoun, 1998). Five contributing constructs have emerged: New Possibilities, Relating to Others, Personal Strength, Spiritual Change, and Appreciation for Life through factor analysis. Preliminary reliability analysis showed the measure to have strong internal consistency ($\alpha = .90$).

Sociodemographic and clinical data. These data were recorded on a demographic and clinical information sheet and hospital records. Demographic information included factors such as; age, gender, marital status, education, monthly family income, and employment status (see Table 1). Demographic characteristics show the sample consisted of men ($n = 113$) and most of them were married, because all recipients that we're married, widowed, or divorced were categorized as married and those who were unmarried or engaged were considered to be 'unmarried' for the study. Most recipients were educated to matric level, with a moderate rate of professional qualification ($M = 11.02$, $SD = 4.01$) and we're currently working ($n = 80$) with an average income above 75, 000 PKR ($M = 81720.58$, $SD = 99530.87$).

Table 1

Socio-demographic Characteristics of the Recipients

Variable	<i>n (%)</i>	<i>M (SD)</i>
Age		38.50 (12.35)
Education		11.02 (4.01)
Monthly Family Income (PKR)		81720.58 (99530.87)
Gender		
Male	113 (83.1%)	
Female	23 (16.9%)	
Marital Status		
Married (Widowed, Divorced)	106 (77.9%)	
Unmarried	29 (21.3%)	
Employment Status		
Employed	80 (58.8%)	
Unemployed	56 (41.2%)	

Note. K = 1000

Clinical and medical variables included (cause of renal failure, donor source, postoperative complications, time since RTx, hemoglobin, serum creatinine, and duration of dialysis (see Table 2 and 3). Mean age at ESRD was 33.25 years ($SD = 11.83$) ranging from 19 to 64 years. Post-transplant time ranged from 1 month to 10 years. Hypertension was reported to be the main cause of ESRD in most recipients ($n = 92$) and most of the recipients ($n = 99$) tended to have more than 6 months of dialysis therapy before transplant, having a living related kidney transplant ($n = 114$) from a male donor ($n = 80$). The sub-samples comprised of recipients currently taking three combinations of medications, i.e. two immunosuppressant drugs (compulsory for transplant recipients), cyclosporine with steroids, and another drug (Mefotonil) with steroids, cyclosporine, and Mefotonil with steroids, cyclosporine only and Mefotonil only. Most of the recipients were currently maintained on the drug Mefotonil only ($n = 80$).

Table 2*Clinical/Medical Characteristics of the Recipients*

Variable	<i>n</i> (%)
Duration of ESRD (Years)	
< 1	34 (25.0%)
1-4	84 (61.8%)
5+	18 (13.2%)
Causes of Renal Failure	
Hypertension	92 (67.6%)
Hypertension and Comorbidities	14 (10.3%)
Diabetes	4 (2.9%)
Nephrotoxicity	8 (5.9%)
No Known Cause	5 (3.7%)
Other Causes	13 (9.5%)
Duration of Dialysis	
No dialysis	8 (5.9%)
< 6 months	30 (22.1%)
> 6 months	9 (72.1%)
Post-transplant Time	
0-5 months	39 (28.7%)
6-11 months	13 (9.6%)
1-4 years	56 (41.2%)
5 years and above	28 (20.06%)
Donor Gender	
Male	80 (58.8%)
Female	56 (41.2%)
Type of Transplant	
Living unrelated donor	22 (16.2%)
Living related donor	114 (83.8%)

Medication Group	
Cyclosporine, Mefotonil & Steroid	77 (56.6%)
Cyclosporine & Mefotonil	20 (14.7%)
Mefotonil	80 (58.8%)
Cyclosporine & Steroid	21 (15.4%)
Mefotonil & Steroid	18 (13.3%)

Clinical and medical variables in Table 3 below show that most RTRs had their renal functions, hemoglobin, serum creatinine, blood urea, uric acid, blood pressure, blood sugar, and cholesterol levels with ideal range reflective of their healthy graft functioning. The high percentage of normal renal functioning indicators ensured healthy functioning of the transplanted kidney and efficacy of renal transplants.

Table 3

Clinical and Medical Indicators Associated with Renal Transplants

Variable	<i>M (SD)</i>	<i>Normal Range</i>
Serum Creatinine (SCr)	1.43 (1.23)	0.5-1.4 mg/dL
Hemoglobin (Hb)	14.1 (11.06)	M = 14.0-16.0; F = 12.0-15.0 mg/dL
Blood Urea	37.93 (20.41)	15.0-45.0 mg/dL
Uric acid	5.81 (3.52)	M = 3.4-7.0; F = 2.4-5.7 mg/dL
Systolic Blood Pressure	128.42 (12.47)	110-130mmHg
Dystolic Blood Pressure	82.74 (8.55)	70-90mmHg
Blood Sugar (random)	134.52 (35.12)	70-180 mg/dL
Cholesterol	126.94 (40.28)	100-200 mg/dL

Informed consent was obtained from all patients before beginning the study. All procedures were carried out in consideration of the ethical standards.

Statistical Analysis

Descriptive statistics were used to summarize the socio-demographic, clinical, and medical characteristics of the sample. Pearson Product Moment Correlation was carried out for categorical variables, to determine correlations of demographic, clinical, and medical variables and their associations with resilience and PTG (Table 4). Variables found to be significant or borderline significant ($p >.10$) would be controlled in the

following logistic regression models. Binary logistic regression models were developed to account for the independent and confounding effects of each covariate on PTG. Socio-demographic variables were entered in the first step, and resilience was sequentially entered in the next step (Table 5).

Results

Table 4 indicated a significant negative correlation of gender with resilience, suggesting that females tend to be more resilient as compared to men. Education was significantly negatively correlated with relating to others which means that more educated recipients expressed less PTG to others. Marital status was negatively correlated with working status and personal strength, single recipients experienced increased PTG especially for personal strength. A significant negative correlation was also found between work status and new possibilities that indicated recipients not working had increased PTG. A negative correlation was also found between blood sugar level and cholesterol suggesting that recipients with controlled blood sugar and cholesterol levels experienced PTG in the domain of spiritual change. Resilience was positively correlated with overall PTG and the domains including new possibilities, personal strength, and spiritual change showing that RTRs who were resilient manifested increased PTG.

Table 4*Pearson Product Moment Correlation of the Study Variables (n= 136)*

Variable	2	3	4	5	6	7	8	9	10	11	12	13
1. Gender	-.11	-.06	.50†	.05	.04	-.17*	-.06	.00	-.17	.01	.12	-.05
2. Education	-	-.06	-.08	-.02	-.1	-.05	-.08	-.27†	.07	-.08	.06	.09
3. Marital Status	-	-	.22*	.02	-.18*	-.16	-.19	-.13	-.06	-.20*	-.15	-.15
4. Work Status	-	-	-	.03	.13	-.17	-.14	-.02	-.23†	-.12	.00	-.03
5. Blood Sugar	-	-	-	-	.57†	-.25†	-.06	-.03	.03	-.15	-.20*	-.03
6. Cholesterol	-	-	-	-	-	-.28†	-.03	.00	.11	-.14	-.22*	-.06
7. Resilience	-	-	-	-	-	-	.35†	.13	.28†	.47†	.27†	.14
8. PTG	-	-	-	-	-	-	-	.72†	.81†	.70†	.47†	.61†
9. Relating to Others	-	-	-	-	-	-	-	-	.35†	.30†	.20*	.26†
10. New Possibilities	-	-	-	-	-	-	-	-	-	.45†	.27†	.46†
11. Personal Strength	-	-	-	-	-	-	-	-	-	-	.44†	.34†
12. Spiritual Change	-	-	-	-	-	-	-	-	-	-	-	.12
13. Appreciation of Life	-	-	-	-	-	-	-	-	-	-	-	-

Note. * p .05

The results of multiple hierarchical regression analysis are presented in Table 5, which revealed resilience was the strongest predictor of overall PTG, new possibilities, personal strength, and spiritual change indicating that RTRs who were resilient developed more adaptive ways that enabled them to experience positive outcomes and improved health status subsequently. Among the socio-demographic and clinical covariates, education was the strongest predictor for relating to others as the formulation of existential questions (as well as the search for their answers) facing adverse life events is stimulated by the acquisition of verbal skills and reading that is acquired through the acquisition of education and knowledge that is necessary to manifest PTG. Work status and cholesterol level also predicted new possibilities indicating that RTRs who had controlled cholesterol levels and not currently employed appeared to take new paths in life more successfully than the recipients who were currently employed.

Table 5*Hierarchical Multiple Regression Analysis Predicting Resilience, PTG, and Sub-Domains*

Predictor	Overall PTG		Relating to others		New Possibilities		Personal Strength		Spiritual Change		Appreciation of Life	
	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1	0.06		.09		.09		.08		.09		.04	
Gender		.02		-.03		-.02		.11		.17		-.05
Education		-.07		-.27*		.09		-.06		.07		.08
Marital Status		-.13		-.15		-.01		-.13		-.08		-.13
Work Status		-.09		.01		-.19*		-.08		-.01		.05
Blood Sugar		-.04		-.04		-.03		-.06		-.11		.09
Cholesterol		.12		.05		.25*		.04		-.07		-.05
Step 2	.10		.10		.17		.26		.14		.05	
Resilience		.34†		.09		.31†		.45†		.24*		.13
Total R ²	.16		.01		.08		.17		.01		.01	
F	3.48†		2.12*		3.73†		6.25†		2.99		1.01	
N	136		136		136		136		136		136	

Note. * $p < .05$

Discussion

This cross-sectional research study assessed the role of resilience, PTG, socio-demographic, clinical, and medical variables after a successful RTx. The findings of the study indicated after efficacious RTx, resilience, and PTG increased. Besides, we found increased PTG for marital status, education, and current working status. The differences in PTG among demographic groups of RTRs, despite similar health status and graft functioning, reflects that it is not just transplanted kidney that makes recipient perceive positive consequences of the traumatic transplant surgery, but other environmental factors, like living conditions, relationships with others and their role as part of a society that plays an important role in determining their PTG after facing ESRD. Park (2009) has previously suggested the experience of sudden or lifelong illness can result in positive transformation as these factors not only influence the coping strategies but also help the person to successfully adjust to life crisis which in turn results in PTG (Schaefer & Moos, 1998).

Results also revealed marital status was negatively related to personal strength, i.e. single recipients expressed increased PTG compared to married recipients. This is supported by the fact that patients who are young and single are more flexible in examining and changing their life perspectives in the face of adversity (Dirik & Karanci, 2008).

Education predicted relating to others, highly qualified recipients experienced major changes in relationships with others, that included an increased sense of kindness, understanding, and closeness (Calhoun & Tedeschi, 2006) as through the acquisition of education and knowledge; verbal skills and reading encourage the formulation of existential questions (as well as the search for their answers) facing adverse life events necessary to manifest PTG.

Work status negatively predicted PTG for new possibilities and suggested recipients who were not currently employed appeared to have a new and changed view of life that altered the prior suppositions and schemas about the illness resulting in the experience of growth in the form of new possibilities and opportunities that were absent before the renal transplants (Tedeschi & Calhoun, 1996, 2004), leading towards a transition in the needs and goals of life and increased regard for life (Lindstrom, Cann, Calhoun & Tedeschi, 2013).

No other socio-demographic factors predicted personal strength and spiritual change for PTG, which suggests other psychosocial factors such as resilience may have a role in contributing to spiritual change and development. Likewise, cholesterol was the only medical and clinical

condition that significantly predicted PTG through new possibilities. And strangely enough elevated cholesterol levels caused the recipients to learn new alternatives and choices in life. According to the literature, the emergence of new possibilities in life, developing new interests and activities can be linked with disease conditions that motivate recipients to manage their cholesterol levels within the optimal range. The trauma of renal failure and postoperative wellbeing needs to be addressed; thus transforms of previous schemas seeking new possibilities and opportunities (Lindstrom, Cann, Calhoun, & Tedeschi, 2013; Tedeschi & Calhoun, 1996, 2004) may be geared by the danger of reverting to traumatic states.

The present study found resilience as a significant factor in predicting PTG in recipients. The finding explained that the recipients who were more resilient appeared to manifest greater PTG for new possibilities, personal strength, spiritual change, and appreciation of life except relating to others. As explained by the literature, resilience is conceptualized as a multi-dimensional construct comprising a set of positive approaches and actions that facilitate problem-focused coping strategies to sudden and lifelong traumatic events (Lamond et al., 2008). Characteristics like internal locus of control, positive self-image, and positive life orientation are typically characterized by individuals who appear to possess resilience (Karatas & Cakar, 2011; Diehl & Hay, 2010). Such attributes and qualities are related to improvement in physical and psychological health (Connor & Davidson, 2003), increased adaptive and health-promoting behaviors in contempt of adverse happenings (Aspinall & MacNamara, 2005). All of the mentioned characteristics improve one's wellbeing and prevent the onset of psychopathologies like Posttraumatic Stress Disorder (PTSD) (Catalano, Chan, Wilson, Chiu, & Muller, 2011). The study found that female recipients were more resilient than their male counterparts; and the literature suggests, women in stressful events in life (Rausch, Auerbach, & Gramling, 2008) use more positive reevaluation and effective coping than men (Tamres, Janicki, & Helgeson, 2002).

In the context of health psychology, resilience can be central to the promotion of health and wellbeing. This trait increases an individual's ability to react optimistically during stressful events, even during serious threats that safeguard health or wellbeing (Friendli, 2009; Luthar, Cicinatti, & Becker, 2000; Rutter, 2006). The progression of the disease and ensuing symptoms burden terminal conditions (like ESRD) and affect mental processes, such as stress and resilience, compromise healthy functioning of the immune system, and increase susceptibility to the

disease and poor health (Aspinwall & Tedeschi, 2010; Schiavone, Jaquet, Trabace, & Krause, 2013). Problem-focused coping strategies boost biological, neuroendocrine, and neural changes that augment resilience, resulting in managing the illness with social skills that improve the ability to seek social support (Aspinwall & Tedeschi, 2010; Rutter, 2012).

Along with other factors like emotional regulation, locus of control, and optimistic life orientation (Vanderbilt-Adriance & Shaw, 2008) that shield adversity, strong resilience is associated with affective reactions to trauma that involves resistance to environmental risk experiences or traumatic events. Renal transplants along with the postoperative challenges are endured by resilient patients making positive transitions in life; and if this is supported by social and financial backings resilience is further fortified (Janlert, 2009). Ryan and Deci (2001) and others (Catalano et al., 2011) propose resilience enables better psychological wellbeing and improving physical health as well that consequently enhances the quality of life (QoL) of the RTRs.

Conclusion

This study examined the impact of the effectiveness of renal transplants on PTG in Pakistan, highlighting the importance of resilience influencing PTG, which resulted in improved health status and graft survival. All domains of PTG showed improvement after transplants however socio-demographic factors did not, indicating that transplants were the main reason that explained positive transitions (PTG) and improved QoL in patients.

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