



Resilience is associated with low psychological distress in renal transplant recipients



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ABSTRACT

Objective: Renal transplantation (RT) is a significant life event; its subsequent challenges often lead to psychological distress, which substantially lowers patients' quality of life. The purpose of this study was to screen psychological distress and examine the relationships between resilience and psychological distress in RT recipients.

Methods: Participants were 139 RT recipients from the RT follow-up clinic and ward in the departments of nephrology of three general hospitals in Jinan, China. They were assessed using the Connor-Davidson Resilience Scale, Perceived Social Support Scale and Kessler Psychological Distress Scale. Logistic regression analyses were used to evaluate the relationships between resilience and psychological distress after adjusting for perceived social support.

Results: Fifty-nine (42.4%) RT recipients were considered as experiencing "psychological distress" (K10 score ≥ 22). Resilience was associated with psychological distress after controlling for perceived social support and sociodemographic variables: a one-point increase in resilience decreased the likelihood of having possible psychological distress (odds ratio = 0.945, 95% confidence interval = 0.914–0.976, $P < .01$).

Conclusions: The present study suggests that resilience was significantly associated with low psychological distress in RT recipients. Psychosocial interventions focused on resilience might provide useful approaches to overcome psychological distress in RT recipients.

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1. Introduction

Renal transplantation (RT), as a well-established treatment for end-stage renal disease, has gained popularity worldwide for its high success rate. RT is a positive event for most patients, as it means they can discontinue dialysis. However, RT recipients might face several new challenges after kidney transplant surgery, such as intensive immune suppressive drug treatment, probability of organ rejection, tendency for infection and uncertainty about their social status, which may make them feel stressed and subsequently render them susceptible to psychological distress and disorders [1–3]. Indeed, RT recipients often report suffering from clinically relevant symptoms of psychological distress, such as depression and anxiety, after successful surgery [2], which substantially lowers their quality of life [4] and potentially interferes with treatment compliance [1]. It is therefore important to regularly screen and properly manage psychological distress in this population.

To date, sparse but emerging literature has identified several psychosocial factors related to psychological distress, such as personal

attributes and environmental factors [5]. Studies of environmental resources have suggested that social support is a protective factor that could buffer against stress and independently reduce psychological distress [6–8]. Recently, the association between perceived social support and psychological distress has gained research attention; however, little is known about the effect of perceived social support on psychological distress among RT recipients.

As positive psychology is increasingly used to prevent and treat mental health problems, the role of resilience is being recognized. Resilience is widely acknowledged to be a complex and dynamic construct, which has been defined as "the process of adapting well in the face of adversity, trauma, tragedy, threats or even significant sources of threat". It embodies personal qualities enable one to successfully adapt, maintain or regain individuals' mental health in the face of significant adversity or risk [9–10]. Studies have suggested that people displaying resilience make better psychological adjustments in the face of acute or chronic stressors [11–13]. Individuals with high resilience cope with stressful events more efficiently [14], and show reduced psychological distress after exposure to stress or trauma [15,16]. As RT has frequently been regarded as a potentially traumatic event, resilience might be expected to influence psychological distress in response to RT. However, to the best of our knowledge, the exact nature of the association between resilience and psychological distress has not yet been elucidated among RT recipients.

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In this cross-sectional study, we anticipated that higher levels of resilience in RT recipients would predict better mental health status after the traumatic event of RT. This study was designed to explore (1) the level of psychological distress among RT recipients, and (2) the relationship between resilience and psychological distress after adjusting for perceived social support. We hope that our results will contribute to understanding the role of resilience in improving the mental health status of RT recipients, as well as provide clinical staff and family caregivers with information on psychological interventions and psychological care programs for RT recipients.

2. Methods

2.1. Participants and procedures

This cross-sectional study was performed between July 2013 and September 2014. The RT survivor patients were recruited from the RT follow-up clinic and ward in the Departments of Nephrology of three general hospitals in Jinan, China. Inclusion criteria for the patients were (a) at least 18 years old; (b) an interval of at least 1 year after RT; (c) stable clinical condition, namely, the absence of any infection or acute complication; (d) no consciousness disorders; (e) no current psychotic disorders; (f) no hearing, reading, or cognitive disabilities and able to understand the content of the questionnaire and cooperate with the investigation; and (g) willing to participate in this survey. Of 180 eligible patients, 152 participated and 28 refused. The reasons for refusal were disinterest ($n=16$), not enough time ($n=10$) and tiredness ($n=2$). In addition, 13 participants were excluded due to incomplete survey answers. Finally, 139 patients were involved in the study.

The study was approved by the Institutional Review Board of Shandong University. Written informed consent was obtained from all the participants before the commencement of the survey. The self-administered questionnaires were completed with the guidance of trained nurses at each research point in the hospitals.

2.2. Measures

The Kessler Psychological Distress Scale (K10 scale) is a self-completed measure assessing psychological distress with 10 items about the negative emotional states experienced by an individual during the past 4 weeks [17]. The K10 scale has previously displayed excellent psychometric properties [18], and the reliability and validity of the Chinese version has also been verified [17,19]. All items are scored on a 5-point frequency-based rating scale ranging from 1 (*never*) to 5 (*all of the time*). The total scores range from 10 to 50, representing an increasing gradient of psychological distress. Individuals scoring 10–15 are likely to be well, 16–21 have mild psychological distress, 22–29 have moderate psychological distress and those scoring 30–50 are experiencing severe psychological distress. In this study, participants were divided into “the distressed group” and “the non-distressed group” according to the K10 categories, in which we combined those who indicated “being well” and experiencing “mild psychological distress” (i.e., K10 scores of 21 or less) as not distressed and those who indicated “moderate” and “severe” levels of psychological distress (i.e., K10 scores of 22 or greater) as being distressed [20,21].

The Connor-Davidson Resilience Scale (CD-RISC) is a 25-item measure assessing resilience [22]. Items are rated on a 5-point frequency-based rating scale, ranging from 0 (*not true at all*) to 4 (*true nearly all the time*). Higher total scores indicate higher resilience. A recent systematic review suggested that the CD-RISC has the best psychometric properties among measures of resilience, with the ability to evaluate changes in resilience [23], and its reliability and validity in the Chinese population was documented in Yu's study [22]. Cronbach's alpha in this study was 0.890.

The Perceived Social Support Scale (PSSS) is used to evaluate subjective social support from friends, family, and significant others [24]. It

contains 12 items grouped in three subscales: family support, friend support, and other support (leaders and colleagues). Each subscale has four items, with scores ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Higher scores indicate greater social support. Zimet [25] investigated and found good reliability for the total score. Moreover, the Chinese version of the PSSS has been widely used in Chinese studies and has demonstrated satisfactory reliability and validity. Cronbach's alpha was 0.886 in this study.

Sociodemographic and clinical factors were collected from participants and hospital charts, including demographic factors (age, gender, marital status, education, family income, and employment status) and clinical variables (cause of renal failure, donor source, postoperative complications, time since RT, hemoglobin, serum creatinine and duration of dialysis).

2.3. Statistical analysis

Statistical analyses were conducted using Statistical Package for Social Sciences Version 19.0 software (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to summarize the sociodemographic characteristics of the sample. Chi-square tests were conducted for categorical variables, and *t* tests were carried out for continuous variables to determine whether there were statistically significant differences in demographic and clinical variables between the distressed and nondistressed RT groups. 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 psychological distress. Sociodemographic variables and perceived social support were entered in the first step, and resilience was sequentially entered in the next step. To further explore the role of resilience on psychological distress, we conducted primary and secondary analyses. In the primary analysis, resilience was treated as a continuous variable, and in the secondary analysis, resilience was implemented as a categorical variable. As the CD-RISC has no clear cutoff value [26], resilience was transformed into a dichotomous variable (low vs. high) using receiver operating characteristic (ROC) curves to select the cutoff point with the best discriminative ability. The area under the curve (AUC) was an index of the goodness of the measure. AUC values greater than 0.7 indicate that the measure is discriminative. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated, and the results were considered statistically significant at the $P<.05$ level and as borderline significant at the $P<.10$ level.

3. Results

The mean (\pm S.D.) age of the participants was 37.3 (\pm 10.9) years; 74.1% were male, 73.4% were married, 42.4% had lower monthly incomes ($<\text{¥}1000$) and 56.8% had already returned to work. All patients had relatives as the kidney source. The average time since RT was 3.02 (\pm 2.51) years, ranging from 1 to 16 years, and the average duration of dialysis before transplantation was 9.42 (\pm 14.22) months; 43.9% experienced complications, including rejection reactions (10.8%), pulmonary infections (23.7%) and other complications (9.4%) such as pulmonary embolism and herpes.

Among the patients, 22.3% were likely to be well, 35.3% were affected by mild psychological distress, 36.0% had moderate psychological distress and 6.5% experienced severe psychological distress. Overall, 59 (42.4%) were considered affected by “psychological distress.” The distressed and nondistressed RT groups did not differ in terms of age, gender, education, marital status, family income, employment status, cause of renal failure, post operative complications, time since RT, hemoglobin, serum creatinine and duration of dialysis. Compared with the nondistressed RT survivor group, the distressed group was more likely to be unemployed ($P=.060$), to have lower education levels ($P=.071$) and lower monthly income ($P=.087$), though these

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