

Personality profile of kidney transplant patients: the alternative five factor model

Perfil de personalidad en pacientes con trasplante renal: el modelo alternativo de los cinco factores

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Abstract

Background: There is limited research on personality traits that characterizes kidney transplant patients. The aim of this study was to describe the personality profile of kidney transplant patients using the Alternative Five Factor Model (AFFM), and compare it with the Spanish standard population.

Method: Personality was assessed using the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ). A sample of 207 kidney transplant patients was matched by age and gender with 207 standard range controls. A logistic regression analysis was utilized to study the contribution of each ZKPQ dimension to describe the distinctive transplant patient's profile.

Results: Significant differences were showed in Neuroticism-Anxiety ($p=.001$), Aggression-Hostility ($p=.009$), and Activity ($p=.001$) dimensions, with lower scores in transplant patients compared with the standard population. But Sociability ($p=.024$) was significantly higher in kidney transplant patients. In logistic regression analysis low scores on Neuroticism-Anxiety ($p=.005$) and Activity ($p=.001$) were the significant predictors to characterize personality traits of kidney transplant patients.

Conclusions: Kidney transplant patients had a differential profile under the AFFM compared to standard range sample, with lower scores on Neuroticism-Anxiety and Activity dimensions.

Key words: Personality, kidney transplantation, biobehavioral sciences, population surveillance.

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Resumen

Introducción: la investigación sobre rasgos de personalidad en pacientes con trasplante renal es limitada. El objetivo de este estudio fue describir el perfil de personalidad de pacientes con trasplante renal, utilizando el modelo alternativo de cinco factores (AFFM), y compararlo con población estándar española.

Material y métodos: la personalidad fue evaluada mediante el Zuckerman-Kuhlman Personality Questionnaire (ZKPQ). Una muestra de 207 pacientes con trasplante renal se emparejó por edad y género con 207 controles de la población estándar. El análisis de regresión logística permitió estudiar la aportación de cada dimensión del ZKPQ al perfil distintivo de los pacientes trasplantados.

Resultados: aparecieron diferencias significativas en las dimensiones de Neuroticismo-Ansiedad ($p=.001$), Agresión-Hostilidad ($p=.009$) y Actividad ($p=.001$), con puntuaciones bajas en pacientes trasplantados en comparación con la población estándar. La sociabilidad ($p=.024$) fue significativamente mayor en pacientes trasplantados. En el análisis de regresión, las bajas puntuaciones en Neuroticismo-Ansiedad ($p=.005$) y Actividad ($p=.001$) fueron predictores significativos para caracterizar los rasgos de personalidad de pacientes trasplantados.

Conclusiones: desde el AFFM, los pacientes con trasplante renal muestran un perfil diferente de personalidad comparado con la población estándar, con bajas puntuaciones en las dimensiones de Neuroticismo-Ansiedad y Actividad.

Palabras clave: personalidad, trasplante de riñón, ciencias bioconductuales, vigilancia de la población.

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Introduction

Kidney transplantation is one of the best treatment options for end-stage kidney disease. This intervention provides health-related quality of life indexes with values similar to those of the general population.¹ In 2017, Spain reached an annual rate of 70.5 transplants per million population (including all combinations), surpassing 3100 kidney transplants.²

Studies that relate personality traits with the adherence to health behaviors have emerged in the scientific literature. It should be noted that in no case we refer to personality disorders as a diagnostic entity, in this sense, previous studies indicate that the prevalence of personality disorders in transplant patients is similar to that of the general population.³ In the studies on personality, the Big Five Factor Model (BFFM) stands out, using the NEO-PI-R as assessment instrument.⁴ The basic assumption of this model is that the most outstanding and socially relevant individual differences of people are encoded in the linguistic terms of their respective languages. These differences are grouped into five large areas or dimensions that describe personality; they would be Openness to Experience, Responsibility, Extraversion, Kindness and Neuroticism or Emotional Instability.⁴ Within this model, studies carried out in kidney transplant patients indicate that high scores on Neuroticism, medium scores on Kindness and Extraversion, and low scores on Openness to experience are related to good glomerular filtration rate in the post-transplant.⁵ In addition, a higher score in Responsibility is associated with higher vital satisfaction⁶ and adherence to treatment after transplantation.⁷ However, in other studies, high scores on Neuroticism are associated with difficulties in disease acceptance and poorer health-related quality of life.⁸ Low scores on Openness to experience are related to behaviors that are not adherent to immunosuppressive treatment.⁹ While in patients on the waiting list for kidney transplantation, a low score in Neuroticism and a high score in Extraversion account for a variance of 20% on the performance of self-care behaviors.¹⁰

In the face of the BFFM based on a lexical or cultural approach, the Alternative Five Factor Model

(AFFM) is considered, using as measurement instrument the Zuckerman Kuhlman Personality Questionnaire (ZKPQ)¹¹; this questionnaire was developed from a series of factorial analyses in basic personality dimensions arising from neurobiological research in humans to assess normal personality. This model contains five basic personality traits: Neuroticism_Anxiety (N_Anx), Activity (Act), Sociability (Sy), Sensation Seeking_Impulsivity (ImpSS) and Aggression_Hostility (Agg_Host). In the AFFM, unlike the cultural approach, Activity and Sociability constitute two separate factors of Extraversion, and the dimension of Neuroticism differed in the factors of Impulsivity and Hostility.¹¹

This is one of the first studies where the personality traits in kidney transplant patients are assessed from the AFFM personality model. The objective of the study was, first, to describe the characteristic personality profile of kidney transplant patients using the Zuckerman-Kuhlman questionnaire (ZKPQ), and to compare it with an age- and gender-matched control group of the Spanish standard population; second, to determine the discriminant capacity of the dimensions of the ZKPQ when evaluating kidney transplant patients.

Materials and methods

Participants

The study was conducted from the Nephrology and Renal Transplant Service of a General University Hospital, during the period between March 2012 and December 2016. As inclusion criteria, it was taken into account that the patients were kidney transplant recipients, over 18 years of age and that were under outpatient follow-up by the Nephrology Service. Patients with concomitant disease or acute infection, or significant cognitive impairment that would prevent them from completing the questionnaire due to reading or comprehension difficulties were excluded.

A total of 299 patients were proposed to participate in the study, of them, 207 (69.23%) agreed to complete the questionnaire. The reasons for not

participating in the study were lack of interest ($n=19$), more than 50% of incomplete items in the questionnaire ($n=31$), physical discomfort ($n=17$), language comprehension difficulties ($n=15$), loss of kidney graft ($n=8$) or death ($n=2$). No significant differences were observed between participants and non-participants regarding age, gender and educational level. The control sample consisted of 207 individuals drawn from a standard population sample, stratified by gender and age, of 741 men and 937 women with an age range between 18 and 93 years. This sample of the standard population was part of a larger study carried out to obtain the ZKPQ scales in the Spanish population, complying with the census projections in the distribution by gender and age of the Statistical Institute of Catalonia (IDESCAT).¹² To meet the objective of this study, both samples were stratified by gender and age, being the educational level included as a covariate variable.

Measurements

Socio-demographic and clinical variables from each patient, such as age, gender, marital status, educational level, cause of kidney disease, and previous renal replacement therapy were collected.

The personality dimensions were assessed using the Spanish version of the Zuckerman Kuhlman Personality Questionnaire (ZKPQ).^{12,13} This is a self-administered questionnaire with 99 items of dichotomous response, true or false. Five personality factors are assessed: Neuroticism_Anxiety (N_Anx, 19 items), consisting of items referring to be worried, fearful or undecided and sensitive to the criticism from others or lacking self-confidence; Activity (Act, 17 items), includes the need for having a continuous activity, incapacity to rest or the preference for challenging jobs with a high degree of energy to work or perform multiple task simultaneously; Sociability (Sy, 17 items), referring to the number of friends and the time spent with them, or preference for the company of others in contrast to being alone and doing solitary activities; Impulsivity and Sensation Seeking (ImpSS, 19 items), referred to the lack of planning and the general need for adventure and excitement or preference for situations; and

Aggression_Hostility (Agg_Host, 17 items), referring to the predisposition to express verbal aggression, having a rude and careless behavior towards others and impatience. In addition, an Infrequency scale (Infreq, 10 items), is included as a measure of quality of the response to the questionnaire. The psychometric properties of the Spanish version show adequate values of reliability in the total score ($\alpha=.77$) and in the subscales, with an α value in the range of .70 to .85.¹⁴

Procedure

One month after performing the kidney transplant surgical intervention, the patients were interviewed by a clinical psychologist, and responded to a structured interview to collect data on socio-demographic and clinical characteristics, and fill in the ZKPQ questionnaire. The data were collected in a single evaluation. The evaluation protocol lasted about 20 to 30 minutes. The data collection and the patient interview were carried out in an outpatient clinic adjacent to the hospital.

The candidates for the study received oral and written information about the project, and those who agreed to participate signed the informed consent. This study followed the ethical standards of the Declaration of Helsinki¹⁵ and the Declaration of Istanbul,¹⁶ and was approved by the Research Ethics Committee of the hospital.

Statistical analysis

The data analysis was carried out in two parts. First, the socio-demographic and clinical characteristics analyzed with descriptive statistics and measures of central tendency were recorded, and the normality in the distribution was verified. Means, standard deviation and Cronbach's alpha were calculated for both groups, and differences between groups were analyzed using the Student's *t* test for independent samples. In addition, Cohen's *d* was calculated. To evaluate the discriminant capacity of the ZKPQ scales in transplant patients with regard to the control group of the standard

population, a logistic regression analysis was performed. The five personality dimensions of the ZKPQ were introduced as predictor variables, and the dichotomous response of the participants as the dependent variable. The step-by-step method was used to enter the variables, and the contribution of each dimension of the ZKPQ was calculated to describe the distinctive personality profile in kidney transplant patients. The educational level, because it did not follow a normal distribution, and the Infrequency scale, because it was not considered a dimension of the theoretical model, both were introduced as adjustment variables.

All statistical analyzes were bilateral and the assumed alpha risk was 5%. The data were collected and analyzed with the SPSS version 21.0 statistical package.

Results

Patients

Table 1 describes the sociodemographic and clinical characteristics of the patients who participated in the study. The majority were men with an age range between 18 and 76 years, married or with a partner, and middle grade educational level. The most prevalent renal insufficiency is due to glomerulonephritis, with a previous renal replacement therapy by hemodialysis.

Comparison between kidney transplant patients and the standard population in the dimensions of the ZKPQ

In Table 2 are shown the means, standard deviations, Cronbach's alpha, t-test and Cohen's d test of the dimensions of the ZKPQ for both samples. In the kidney transplant group, the internal consistency of the five personality dimensions ranges from an alpha of .68 to .84, with a mean of .75.

These reliability indices are similar to those of the control sample, to the standard population, and to those obtained in other population samples that use the ZKPQ.¹⁷ Both groups are significantly different in all

Table 1. Sociodemographic and clinical characteristics of kidney transplant patients (n= 207).

Age		
Mean (SD)	51.92 (13.12)	
	Number of patients (n)	Percentage (%)
Gender		
Men	139	67.1
Women	68	32.9
Marital status		
Married/with a partner	140	67.6
Single	39	18.8
Divorced/widowed	28	13.6
Educational level		
Elementary	84	40.6
High school	111	53.6
University	12	5.8
Nephropathy		
Glomerulonephritis	52	25.1
Unknown causes	36	17.4
Polycystosis	34	16.4
Tubulointerstitial	27	13
Vascular	25	12.1
Diabetic	24	11.6
Other	9	4.4
Previous renal replacement therapy		
Hemodialysis	123	59.4
Peritoneal dialysis	56	27.1
None	28	13.5

dimensions of the ZKPQ, except for ImpSS, with a medium to small effect size. When comparing the values of the standard population with those of kidney transplant patients, there are differences in the dimensions of Neuroticism_Anxiety ($t=3.48, p=.00$), Activity ($t=3.22, p=.00$), and Aggressiveness_Hostility ($t=2.63, p=.00$) being the lowest scores in kidney transplant patients, while they are high in the

Table 2. Mean difference of the dimensions of the ZKPQ between kidney renal patients and control group, Cronbach's alpha and Cohen's *d*.

ZKPQ	Transplant (<i>n</i> = 207)			Control (<i>n</i> = 207)			<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	α	<i>M</i>	<i>SD</i>	α			
N_Anx	5.79	4.24	.84	7.29	4.55	.83	3.49	.001	0.34
Act	7.30	3.18	.69	8.38	3.64	.75	3.22	.001	0.32
Sy	7.20	3.06	.68	6.46	3.52	.77	-2.26	.024	-0.22
ImpSS	6.08	3.52	.75	6.63	4.01	.80	1.49	.138	0.15
Agg_Host	6.11	3.44	.78	6.95	3.04	.67	2.64	.009	0.26
Infreq	3.04	1.42	–	2.19	1.65	–	-5.62	.001	0.55

Note. ZKPQ: Zuckerman Kuhlman Personality Questionnaire; N-Anx: Neuroticism-Anxiety; Act: Activity; Sy: Sociability; ImpSS: Impulsivity-Sensation Seeking; Agg-Host: Agression-Hostility; Infreq: Infrequency.

Sociability scales ($t = -2.26, p = .02$) for kidney transplant patients.

Discrimination capacity of the ZKPQ scales in kidney transplant

To evaluate the discriminant capacity of the personality dimensions of the ZKPQ, and differentiate kidney transplant patients from the control group, which was the standard population, a logistic regression was performed using the method of steps for the introduction of variables (Table 3). The five dimensions of the ZKPQ were entered in the regression analysis as predictor variables, and the group of origin (coded as 1 to the kidney transplant group, and 0 to the control group) as the dependent variable. Since both groups were significantly different in the educational level ($X^2 = 67.78, p > .001$) and the Infrequency scale is not considered a dimension of the theoretical model,

these two variables were entered in the model as adjustment variables.

The model resulted statistically significant ($X^2 = 123.84, p = .001$). Of the five dimensions of the ZKPQ entered in the regression analysis, only two dimensions, Neuroticism_Anxiety ($p = .005$) and Activity ($p = .001$), were significant. According to this result, low scores on the dimension of Neuroticism_Anxiety and low in the dimension of Activity of the ZKPQ increase the probability of being fit for the kidney transplant group (Table 3).

Discussion

This is one of the first studies where the personality traits in kidney transplant are assessed from the AFFM model. The kidney transplant

Table 3. Logistic regression analysis of the ZKPQ scales.

Scale	<i>B</i>	<i>Wald</i>	<i>p</i>	<i>Exp(B)</i>	95% CI
Neuroticism_Anxiety	- 0.08	8.04	.005	0.93	0.88-0.98
Activity	-0.13	14.14	.001	0.88	0.82-0.94
Constant	0.89	4.62	.032	2.45	

Note: Control group: 0; kidney transplant patients: 1; CI: confidence interval

patients obtain low scores on Neuroticism_Anxiety, Activity and Aggressiveness_Hostility and high in the Sociability scale. Low scores in Neuroticism facilitate acceptance of the disease and the perception of Low scores in Neuroticism facilitate acceptance of the disease and the perception of a good health-related good quality of life.^{8,18} In our study, low scores in Neuroticism are linked with high values in sociability, which from the BFFM model is assessed with the Extraversion dimension, and appears to be a significant predictor in the performance of self-care behaviors for patients on the waiting list for kidney transplant.¹⁰

Low scores on the Neuroticism_Anxiety dimension and in the Activity dimension of the ZKPQ characterize the group of kidney transplant patients. In this sense, the low scores on these two dimensions, Neuroticism and Activity, are the ones that best correlate with the absence of risk behaviors (consumption of tobacco, drugs, alcohol...).¹⁹ Thus, the lack of adherence to treatment in kidney transplant patients has been associated with an active style of coping with the disease.²⁰ On the other hand, from the BFFM model, it is agreed that low scores in Openness to Experience characterize the good evolution of the kidney transplant patient, with little interest in new or out-of-routine activities, and a tendency to maintain the usual lifestyle.⁵ This style of behavior, conventional and resistant to new experience is also manifested in patients who received heart or lung transplants.²¹

We highlight from these results that in the face of a chronic disease that requires an adaptation of the lifestyle, the behavior does not appear to be a response determined by fixed personality traits, but rather, in the face of health maintenance, the personality traits are conditioned by a range of physical, social and economic factors, which determine the final behavior of the individual. Given the characterization of the personality profile of kidney transplant patients carried out in this study, it would be of interest for future lines of research to evaluate the results associated with these personality traits, that is, in relation to health-related quality of life indices or adherence to treatment or include, also, biochemical values, such as glomerular filtration rate and creatinine level.

Some limitations of the present study should be noted, such as having carried out the evaluations in a single center, which makes it difficult to generalize the results. In addition, the study was conducted with a cross-sectional design that makes it difficult to assess the changes associated with the progress of the disease, which would require replication of the study with a longitudinal design.

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Conflict of interest

The authors declare that there is no conflict of interest in this work.

Ethical responsibilities

Protection of people and animals

The authors declare that no experiments were performed on human beings or animals for this research.

Data confidentiality

The authors declare that they have followed the protocols of their workplace on the publication of patient data.

Right of privacy and informed consent

The authors declare that patient data do not appear in this article.

Contribution of the authors

GCR has participated in the conception, writing and design of the manuscript.

SVV participated in the analysis and interpretation of the data.

FM and GPP gave their approval to the final version of the manuscript before it was sent for publication. of the manuscript before its submission for publication.

DSM cooperated in the conception and design of the study, and in the approval of the final version of the manuscript with meticulous contributions to its content. MGF actively contributed to the critical review of the manuscript with meticulous contributions to its content.

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