Martínez-López Y, et al. https://doi.org/10.37551/S2254-28842024014

A comparative study of resilience in haemodialysis and renal transplant patients

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Please cite this artcle in press as:
Martínez-López Y, Quintana-Ugando M, Gayol-García EG.
A comparative study of resilience in haemodialysis and renal transplant patients. Enferm Nefrol. 2024;27(3):121-6

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Reception: 01-05-24
Acceptance: 01-28-24
Publication: 06-30-24

ABSTRACT

Introduction: Patients with advanced chronic kidney disease (CKD) undergo renal function replacement methods such as haemodialysis and renal transplantation. Resilience is a protective factor that facilitates adaptation to adverse events that may arise during change.

Objectives: To compare resilience and its dimensions in two groups of patients with CKD according to their method of renal function replacement and by gender, regardless of the group to which they belong.

Material and Method: The study was a cross-sectional analytical study using the validated 25-item Connor-Davidson resilience scale. The variables were resilience levels and dimensions. Gender and age were also included.

Results: 88 patients from the Arnaldo Milián Castro University Hospital participated, of which 53 (52 %) were male, 44 receiving haemodialysis, and 44 with renal transplant. Haemodialysis patients showed higher mean values for resilience (M=79), persistence, tenacity, self-efficacy (M=26), and adaptability and support networks (M=17). In contrast, transplant patients excelled in control under pressure (M=22), power and purpose (M=15), and spirituality (M=9). By gender, males showed higher mean scores on all variables. The Man-Whitney U test yielded statistically significant differences in one group of variables for both forms of grouping.

Conclusions: This study's findings reveal significant differences in resilience and the factors that condition it in the haemodialysis and transplant groups and the groups by gender.

Keywords: psychological resilience; chronic kidney disease; haemodialysis; renal transplantation.

RESUMEN

Estudio comparativo de la resiliencia en pacientes de hemodiálisis y trasplante renal

Introducción: Los pacientes con enfermedad renal crónica (ERC) en fase avanzada se ven sometidos a métodos de sustitución de la función renal, como la hemodiálisis y el trasplante renal. La resiliencia constituye un factor protector que propicia la adaptación ante eventos adversos que pueden surgir durante el proceso de cambio.

Objetivos: Comparar la resiliencia y sus dimensiones en dos grupos de pacientes con ERC según su método de sustitución de la función renal y por género, independientemente del grupo de pertenencia.

Material y Método: El estudio fue transversal analítico y se utilizó la escala validada de resiliencia de Connor-Davidson de 25 ítem. Las variables fueron los niveles de la resiliencia y sus dimensiones. Se incluyeron, además, género y edad.

Resultados: Participaron 88 pacientes del hospital universitario Arnaldo Milián Castro, del total 53 (52 %) fueron del masculino, 44 recibiendo hemodiálisis y 44 con trasplante renal. Los pacientes de hemodiálisis mostraron valores medios superiores en cuanto a la resiliencia (M=79), persistencia, tenacidad y autoeficacia (M=26) y adaptabilidad y redes de apoyo (M=17); en tanto los de trasplante destacaron en control

bajo presión (M=22); control y propósito (M=15) y espiritualidad (M=9). Por género, el masculino mostró promedios superiores en todas las variables. La prueba U de Man Whitney arrojó diferencias estadísticamente significativas en un grupo de variables para ambas formas de agrupación.

Conclusiones: Existen diferencias significativas de la resiliencia y los factores que la condicionan en los grupos de hemodiálisis y trasplante; así como en los grupos por género.

Palabras claves: resiliencia psicológica; enfermedad renal crónica; hemodiálisis; trasplante renal.

INTRODUCTION

Chronic kidney disease (CKD) has a significant global impact, with its incidence increasing exponentially, along with the financial burden of its management and the costs in terms of individual and societal health. According to the WHO, it is estimated that CKD affects 850 million people (more than 10% of the world's population), causes 2.4 million deaths annually, and is currently the eleventh leading cause of death worldwide[1].

In the face of renal function loss, medicine offers replacement alternatives through haemodialysis, peritoneal dialysis, and kidney transplantation. While these options represent hope for the patient, they also expose them to new challenges and complications at the physiological, physical, psychological, and social levels[2]. The process of assimilating new lifestyles for both patients and families is a genuine challenge, which has been studied at many levels.

As this constitutes a serious health problem, the systematic study of adaptive processes and reaffirmation of the self within the disease is a fundamental imperative. Multiple processes and personality traits play a relevant role, and their continued study would shed light on how best to direct psychological support to patients, and in many ways contribute to reordering their psychological framework[3].

In this context, resilience is presented in this study as a category of increasing importance, alongside the growing scientific debate that supports it. Resilience is understood as a dynamic process through which individuals demonstrate positive adaptation despite experiencing adverse situations[4].

It is now recognised that resilience is a multi-level phenomenon, operating across multiple systems and interacting among them[5], involving a variety of resources from the individual's socialisation environment. It thus constitutes a complex process influenced by contextual, personality, social, and socioeconomic factors.

Resilience, acknowledged for its importance, may act as a mediator in reducing negative emotional states through its dimensions: self-confidence, social competence, and social and family support[6].

As a dynamic process, the individual must be able, to some extent, to manage the resources of their own personality, as well as those offered by their environment, ranging from the social framework to factors such as family, community, health services, and others.

Based on these ideas, the present study aims to compare resilience and its dimensions in 2 groups of patients with CKD, according to their method of renal replacement therapy and by gender, regardless of group membership.

MATERIAL AND METHOD

Study design

This investigation constitutes an analytical cross-sectional study, in accordance with the criteria of Hernández et al[7].

Population and sample

Two groups of patients with chronic kidney disease were selected: one on haemodialysis, including 44 patients from the haemodialysis unit of *Arnaldo Milián Castro* provincial hospital from the daytime shifts of that service. The transplant group was also composed of 44 patients from the same institution. During inpatient admission, the study was explained, including how to respond, the importance of the study, and informed consent was obtained. The study period was the second semester of 2022 for both groups.

Sampling was intentional and non-probabilistic, with the following inclusion and exclusion criteria.

Inclusion criteria

1. Belonging to daytime shifts of the haemodialysis unit in the case of the haemodialysis group.
2. Being hospitalised in the case of transplant patients.
3. Providing informed consent.

Exclusion criteria

1. Presence of any psychiatric or neurological disorder that prevents understanding of the task.

Study variables and data collection

Data collection was conducted during the 2nd semester of 2022 using a printed self-administered questionnaire, allowing patients to respond independently before the information was entered into a database created with SPSS v26 software.

The established variables were resilience and its dimensions according to the Connor-Davidson Resilience Scale (CD-RISC)[8]. described in the measurement instrument section. Its dimensions are Persistence-tenacity-self-efficacy (PTS); Control under pressure (CUP); Adaptability and support networks (ASN); Control and purpose (CP); Spirituality (SP). All are continuous quantitative variables.

Additionally, gender (male and female), method of renal replacement (haemodialysis and transplantation), and age were included.

Measurement instrument

The Connor-Davidson Resilience Scale (CD-RISC)[8], widely used worldwide, measures multiple dimensions that encompass both personality-related and external factors. It consists of 25 items scored on a scale from 0="not at all" to 4="always." The construct comprises 5 factors or dimensions: persistence-tenacity-self-efficacy (items 10–12, 16, 17, 23–25), range 0–32; control under pressure (items 6, 7, 14, 15, 18–20), range 0–28; adaptability and support networks (items 1, 2, 4, 5, 8), range 0–20; control and purpose (items 13, 21, 22), range 0–12; and spirituality (items 3, 9), range 0–8. Total resilience ranges from 0–100. Item scores are summed, with higher scores in each dimension indicating greater resilience. This instrument has been validated for the Cuban population at *Universidad Central "Martha Abreu" de Las Villas* by the authors, achieving an internal consistency value of α=.906.

Statistical analysis

For statistical analysis, the SPSS v26 package was used. The tests applied for each group included the Shapiro-Wilk normality test, descriptive statistics for calculation of means (M), medians (ME), standard deviations (SD), and ranges (R). For the qualitative variable gender, frequency and percentage were obtained. Comparison of resilience, PTS, CUP, ASN, CP, and SP between the 2 groups as independent samples was conducted using the Mann-Whitney U test, and likewise between genders irrespective of group membership. Results were considered statistically significant when p≤.05.

Ethical considerations

Informed consent was obtained. The study was reviewed in its design by the institutional ethics committee and approved by the scientific council as part of a research project. Bioethical aspects related to human research were respected, including all elements referenced in the Declaration of Helsinki, confidentiality, autonomy, and equity.

A normality test was applied to the data in each group according to the method of renal replacement therapy, to determine whether they followed a normal distribution. The conclusion was that the data did not follow a normal distribution.

Table 1 illustrates that the transplant group had slightly lower medians in resilience, PTS, and ASN, while CUP and CP showed slightly higher medians. A significant finding was that the range of resilience in the transplant group was higher than in the haemodialysis group, indicating considerable dispersion. In all cases, except ASN, the differences were statistically significant **(table 2)**.

Table 1. Descriptive Variables by Group According to Method of Renal Replacement Therapy.

	Transplant		Haemodialysis	
	Median	Range	Median	Range
Resilience	72	80	82	65
PTA	24	24	27	28
CUP	24	28	20	22
ARA	16	20	18	16
CP	16	20	12	10
SPI	11	12	8	6

PTA: Persistence, Tenacity, and Self-Efficacy; **CUP:** Control Under Pressure; **ARA**: Adaptability and Support Networks; **CP:** Control and Purpose; **SPI:** Spirituality.

Table 2. Mann-Whitney U test for variables by group.

	Groups Compared	Mann-Whitney U	Asymptotic Significance (2-tailed), P Value
Resilience	Transplant vs Haemodialysis	553 500	.001
PTA	Transplant vs Haemodialysis	548 000	<.001
CUP	Transplant vs Haemodialysis	650 000	.008
ARA	Transplant vs Haemodialysis	855 000	.342
CP	Transplant vs Haemodialysis	417 000	<.001
SPI	Transplant vs Haemodialysis	397 500	<.001

PTA: Persistence, Tenacity, and Self-Efficacy; **CUP:** Control Under Pressure; **ARA**: Adaptability and Support Networks; **CP:** Control and Purpose; **SPI:** Spirituality.

RESULTS

The groups were formed as follows: the transplant group included 44 members, of whom 24 (54.5%) were male, with a mean age of M=44.11±11.2 years. The haemodialysis group also included 44 patients, of whom 29 (65.9%) were male, with a mean age of M=50.02±11.3 years.

By gender distribution, the 88 patients included 35 women (39.8%) and 53 men (52%). The mean age among women was M=44±11.5 years, while among men it was M=49±11.4 years.

Table 3 illustrates the behaviour of the variables by gender, regardless of group membership. It shows that men had significantly higher resilience than women, with lower dispersion. Overall, men scored higher across all variables, with resilience, PTS, and ASN being statistically significant **(table 4)**.

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Table 3. Descriptive variables by sex, independent of method of renal replacement therapy.

	Female		Male	
	Median	Range	Median	Range
Resilience	70	79	81	34
PTA	23	28	26	9
CUP	21	31	22	9
ARA	15	19	18	9
CP	12	20	12	3
SPI	8	12	8	2

PTA: Persistence, Tenacity, and Self-Efficacy; **CUP:** Control Under Pressure; **ARA**: Adaptability and Support Networks; **CP:** Control and Purpose; **SPI:** Spirituality.

Table 4. Mann-Whitney U test for variables by sex.

	Sex	Mann-Whitney U	Asymptotic Significance (2-tailed), P Value
Resilience	Women vs Men	560 500	0.002
PTA	Women vs Men	632 500	0.012
CUP	Women vs Men	786 500	0.228
ARA	Women vs Men	630 500	0.011
CP	Women vs Men	766 000	0.159
SPI	Women vs Men	855 532	0.532

PTA: Persistence, Tenacity, and Self-Efficacy; **CUP:** Control Under Pressure; **ARA**: Adaptability and Support Networks; **CP:** Control and Purpose; **SPI:** Spirituality.

DISCUSSION

Statistically significant differences were found between groups in resilience, PTS, CUP, CP, and SP, with ASN being the only exception. As observed, haemodialysis patients obtained higher mean scores in resilience, PTS, and ASN, although the latter was not statistically significant.

It proved difficult to find references in the scientific literature comparing resilience in CKD patients according to their method of renal replacement, although such studies exist. In Japan, Kukihara et al[9], reported mean resilience values of 82.42 points in haemodialysis patients. Similarly, another study relating anxiety, Islamic beliefs, and resilience in haemodialysis patients found an average resilience of 82 points[10], practically identical to the previous finding and similar to those presented in this investigation.

Transplant patients, by contrast, scored higher in CUP, CP, and SP. Regarding spirituality, it is known that religion often serves as a foundation that reinforces spirituality and provides adjustments based on psychological meaning. Niebla et al[11] reported that CKD patients adopt strategies related to religion.

The same authors also emphasised the instrumental role that social and family factors play in the wellbeing of these patients, noting that having a support network can help them address challenges or crises[11].

CUP is linked to stress situations, common in patients on haemodialysis or with kidney transplants. Indeed, many authors relate resilience to stress[12,13]. According to Qiu et al[14], resilience can be defined as an individual's competence and strength to successfully face stressful situations. In a multicentre study in Spain, García-Martínez et al[15] found that resilience was one of the most important predictors of perceived stress.

When comparing by gender, statistically significant differences were observed in resilience, PTS, and ASN, while the other dimensions of resilience showed no major differences. In all cases, men had higher median scores, which also applied to age, with a higher mean. Once again, persistence, tenacity, and self-efficacy, as well as support networks, emerged as the most relevant factors in explaining differences in resilience levels. In a systematic review, González-Flores et al[16] found that psychological factors, social support, and coping are essential for resilience. Similarly, Kukihara et al[9]. demonstrated through modelling that family functioning is significantly associated with resilience. This corroborates that resilience extends beyond individual traits, giving an important role to the socialisation system, as shown in this study.

García-Martínez et al[15] in agreement with this work, found higher resilience in men (71.42 vs 67.15, p=0.291), although the difference was not statistically significant. Conversely, Hayati et al[8] reported mean values of 83 and 82 respectively, in favour of women, with a non-significant p value of 0.764. In any case, gender intersects with sociocultural factors specific to each region, which must not be overlooked.

It should be noted that although the physiological advantages of kidney transplantation over haemodialysis are well established, this does not necessarily extend to psychological domains, underscoring the importance of monitoring resilience as a crucial construct. Londoño[17] reported that in transplant patients, concerns about graft viability increase over time and are greater with worsening physical evaluations.

This study has limitations regarding the number of demographic variables considered and the sample size. Nonetheless, at regional level it is novel, as it addresses a scarcely studied topic. It represents a scientific approach that may inform future intervention strategies and further research, particularly concerning the psychological preparation of CKD patients beginning haemodialysis or awaiting kidney transplantation.

In the case of the transplant group, it should be noted that participants were hospitalised, a condition that may affect resilience. Therefore, it is advisable in future research to include patients outside hospitalisation periods.

It is also suggested that future studies further compare different groups according to renal replacement method, including peritoneal dialysis, and incorporate new variables potentially related to resilience in CKD patients.

In conclusion, it is essential to explore not only resilience levels but also their behaviour across different subgroups, whether by renal replacement method or gender. The resilience process involves both personality and social environment, meaning that the set of variables fostering resilience may differ substantially among individuals and contexts. This specificity must be addressed scientifically.

Each method of renal replacement poses particular challenges. This study showed greater resilience among haemodialysis patients, even though transplantation generally provides greater independence.

Gender and its associated social roles must also be considered, as they are important variables in explaining resilience among patients undergoing renal replacement therapy.

Conflicts of interest

None declared.

Funding

None declared.

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