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Racial/ethnic differences in illness, perceptions in minority patients undergoing maintenance hemodialysis.

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Journal

Nephrology Nursing Journal, 39(1)

ISSN

1526-744X

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Publication Date

2012

Copyright Information

Peer reviewed

NIH-PA Author Manuscript

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Racial/Ethnic Differences in Illness Perceptions in Minority Patients Undergoing Maintenance Hemodialysis

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Abstract

This study examined whether racial/ethnic differences in illness perceptions exist among patients on maintenance hemodialysis. One hundred sixty-one patients with end stage renal disease (ESRD) undergoing maintenance hemodialysis (20% African Americans, 44% Hispanics, 9% Filipinos, and 27% Koreans) completed the Revised Illness Perception Questionnaire. Korean participants had higher emotional disturbance than their counterparts, whereas African-American participants had higher negative perceptions of personal intervention or medical treatment controlling their disease. This study indicates that patients from different racial/ethnic backgrounds undergoing maintenance hemodialysis may perceive their disease differently. This phenomenon could affect clinical outcomes and may require different therapeutic approaches.

Keywords

Maintenance hemodialysis; ethnic differences; racial differences; end stage renal disease

Illness perceptions of patients with end stage renal disease (ESRD) have become the focus of increasing interest in the last decade (O'Connor, Alan, Jardine & Millar, 2008; Timmers et al., 2008; van Dijk et al., 2009). Considerable evidence shows that ESRD has profound effects on patients' lives, with serious physiological, psychological, and socioeconomic implications for the individual and his or her family and community. Many patients with ESRD undergoing chronic dialysis therapy are anxious and depressed, and worry about finances, impaired sexual function, family burden, and loss of independence, all of which contribute to negative perceptions about their disease condition and its treatment (Feroze,

Martin, Reina-Patton, Kalantar-Zadeh & Kopple, 2010; Kimmel, Cukor, Chohen, & Peterson, 2007; Kimmel, Emont, Newmann, Danko, & Moss, 2003). Negative illness perceptions have been associated with increased morbidity and mortality, decreased quality of life, and lower adherence rates to treatment recommendations (Kim & Evangelista, 2010; Peterson et al., 1991; Timmers et al., 2008; van Dijk et al., 2009).

Similar findings related to illness perceptions in several patient groups (such as patients with type 2 diabetes, patients who have undergone coronary artery bypass surgery, patients experiencing an acute myocardial infarction, patients recently diagnosed with head and neck cancer) show that patients' own beliefs about their illness influence health behavior and health outcomes (Alsen, Brink, Persson, Brandstrom, & Karlson, 2010; Hermele, Olivo, Namerow, & Oz, 2007; Scharloo et al., 2005; Searle, Norman, Thompson, & Vedhara, 2007). Research in these patient groups and in patients with ESRD has focused mostly on disease-related factors that influence illness perceptions. To date, little research has focused on the relationship between a patient's culture and illness perceptions in patients with ESRD.

A person's race/ethnicity has the potential to impact one's ability to interpret symptoms and tolerate illness, and it consequently influences the person's illness perceptions. Understanding how a person attributes his or her illness is important because research indicates that these subjective beliefs impact how patients manage their health condition. For example, Jean-Pierre and colleagues (2010) reported that non-Caucasian cancer patients reported more concerns about understanding their diagnosis and treatment plan and were more likely to have negative illness perceptions. Likewise, ethnic minorities diagnosed with heart failure were less likely to understand their symptoms and subsequently faced greater challenges in managing their illness (Lip et al., 2004).

Individuals with different racial/ethnic backgrounds often have their own beliefs and values (Cook, 2003), but racial/ethnic differences in patients' ability to cope and behave in response to ESRD and maintenance hemodialysis therapy are ill-defined and poorly understood. Because research indicates that illness perceptions impact patient behaviors, with regard to managing illness, and that race and ethnicity impact personal illness perceptions, further investigation of these areas is important. Thus, the current study was conducted to 1) examine and compare illness perceptions focusing on the areas of illness attributions and perceived control among minority patients with ESRD undergoing maintenance hemodialysis from different racial/ethnic groups (such as African Americans, Hispanics, Filipinos, and Koreans), and 2) identify differences in illness perceptions within each racial/ethnic group according to sociodemographic (age, gender, income, marital status, education) and clinical characteristics (maintenance hemodialysis vintage).

For this study, the Common Sense Model (CSM) of self-regulation, otherwise known as the Self-Regulation Model (SRM) proposed by Howard Leventhal (1970), was adopted as the theoretical framework. In brief, this model construes self-regulation as a systemic process involving patients' conscious efforts to modulate thoughts, emotions, and behaviors to achieve goals within a changing environment. Fundamental to the CSM is the delineation of a system of emotional processes that are integrally linked with cognitive mechanisms. The CSM evolved from the parallel processing model, which was initially developed to explain the effects of different fear stimuli on human behavior regarding health. As a hierarchical model of an adaptive system, the CSM consists of three main constructs: (a) "the illness perception" that leads to (b) "action planning or coping responses and performance of these," followed by (c) "appraisal or monitoring" of the success or failure of their performance. These three constructs act as a feedback loop. The key construct within the

CSM is lay people's illness perceptions and resulting problem-solving behaviors, such as treatment adherence.

Methods

Study Design, Setting, And Participations

Study participants were recruited between August 2008 and April 2009 at eight outpatient chronic dialysis centers in Los Angeles County, California. The appropriate Institutional Review Boards approved the study. Informed consent was obtained from patients who met the following inclusion criteria: a) diagnosis of ESRD with maintenance hemodialysis treatment three months or longer, lasting 3 to 4 hours, three times per week; b) 18 years or older; c) independent with self-care activities (such as ability to walk and eat without assistance); d) living at home, and e) were African Americans, Hispanics, Filipinos, and Koreans who are able to understand, read, and write English, Spanish, or Korean. Race/ethnicity were determined by self-report.

A total of 168 patients met the inclusion criteria for study participation. All 168 signed informed consent forms to participate in the study; however, seven patients did not return their completed questionnaires and were lost to follow up. A total of 161 patients (95.8%) completed the questionnaire packet in English, Spanish, or Korean as determined by their primary language. The time to complete all questionnaires averaged 40 to 60 minutes.

Instrument

Illness perceptions were assessed using the *Revised Illness Perception Questionnaire (IPQ-R)* (Moss-Morris et al., 2002). The IPQ-R is divided into three dimensions: the *identity dimension*; the *control dimension*; and the *causal dimension*. The identity and control dimensions were used for this study to focus on the study purposes. The IPQ-R has been used to assess illness perceptions of the ESRD population previously by several researchers (Timmers et al., 2008; van Dijk et al., 2009). Previous literature provided evidence that IPQ-R has good levels of both internal consistency and test-retest reliability (Broadbent, Petrie, Main, Weinman, 2006; Moss-Morris et al., 2002). The Cronbach's alphas for the current study ranged from 0.705 to 0.837. The Spanish and Korean versions of IPQ-R were translated and back-translated by professional translators. Internal consistency ranged from 0.601 to 0.810 and from 0.751 to 0.892 for Spanish and Korean versions, respectively.

The *identity dimension,* which consists of 14 items in a yes or no format, addresses the number of symptoms attributed to the illness. The *control dimension* has 38 five-point, Likert-scale items, including the sub-dimensions of timeline (six items with a possible score range of 6 to 30), timeline cyclical (four items with a possible score range of 4 to 20), consequences (six items with a possible score range of 6 to 30), personal control (six items with possible score range of 6 to 30), treatment control (five items with a possible score range of 5 to 25), illness coherence (five items with a possible score range of 5 to 25), and emotional perceptions (six items with a possible score range of 6 to 30) to assess patients' personal views of their current illness. Higher scores on the dimensions of timeline and consequences indicate that patients perceive their illness as chronic with likely illness consequences. Higher scores on the personal control, treatment control, and illness coherence dimensions indicate patients believe they lack control over the negative consequences of their illness and symptoms and also lack a clear understanding of their medical condition. A higher score on emotional perceptions indicates a higher degree of emotional distress due to the illness (Moss-Morris et al., 2002). Overall, higher illness perception scores reflect stronger negative perceptions about their illness.

Demographic information was collected through a simple self-administered form. The form asked participants about their age, race/ethnicity (for example, self-identified African-Americans, Hispanics, Filipinos, and Koreans), marital status, education, current employment status, and annual income. Information pertaining to medical history (such as etiology of ESRD, medications, co-morbidities) was obtained through self-reporting and verified by chart reviews. Information related to the participant's current clinical status (such as maintenance hemodialysis vintage and duration of maintenance hemodialysis sessions) was obtained from participants' medical records.

Statistical Analysis

Data were analyzed using the SPSS version 15 (SPSS Inc. Chicago, IL). Descriptive statistics, including means, ranges, and standard deviations, were used to describe sociodemographic and clinical characteristics and illness perceptions. Comparative analyses of demographic and clinical characteristics and key variables of interest were computed for African Americans, Hispanics, Filipinos, and Koreans using ANOVA. Univariate analysis (Pearson product moment correlation) was used to determine the relationships between clinical characteristics (such as maintenance hemodialysis vintage, time of maintenance hemodialysis sessions, and number of co-morbidities), and illness perceptions.

Results

One hundred sixty-one patients (male = 56.5%) with a mean age of 52.2 ± 15.5 years participated in the study (African Americans – 19.9%; Hispanics – 44.1%; Filipinos – 9.3%; Koreans – 26.7%) (see Table 1). Most participants were unemployed ($n = 138$, 85.7%) because of retirement (17.4%) or medical conditions (82.6%) and had annual incomes below $15,000 ($n = 114$, 70.8%). The most common causes of kidney failure were diabetes (43.5%) and hypertension (27.3%). Hemodialysis vintage was 51.5 ± 50.5 months.

Illness Perceptions According To Race/Ethnicity

Racial/ethnic differences in illness perceptions are illustrated in Table 2. African-American participants had higher mean scores in the dimensions of *personal control* (15.7 ± 5.7, $F = 6.544$, $p < 0.001$) and *treatment control* (15.1 ± 4.0, $F = 5.073$, $p = 0.002$), which indicate that African-American participants had higher negative perceptions of personal intervention or medical treatment controlling their disease than Hispanic participants. Korean participants had more emotional disturbances, such as depression, anger, and anxiety, related to their disease than African-American participants, as represented in statistically significant higher scores in the *emotional perception* dimension (20.4 ± 6.6, $F = 3.274$, $p = 0.023$). The mean score was higher in the dimensions of *timeline (acute/chronic)* (22.2 ± 6.3) in Korean participants, although the differences were not statistically significant among groups.

Illness Perceptions According To Sociodemographic Variables within Race/Ethnicity

Differences in illness perceptions within each racial/ethnic group according to sociodemographic characteristics (such as age, gender, income, marital status, and education) were identified. African Americans with incomes less than $15,000 had a higher score in the dimension of *personal control* (for example, patients did not believe they could improve their medical condition) compared to African Americans with incomes of $15,000 or higher ($18.4 \pm 4.5$ vs. 13.9 ± 5.7, $t = 2.362$, $p = 0.025$). In addition, African Americans who were married or lived with partners had higher scores in the dimension of *treatment control* (for example, patients did not believe their treatment improved their medical condition) than African Americans who were single, divorced, or widowed (17.9 ± 3.9 vs. 14.2 ± 3.7, $t = 2.415$, $p = 0.022$).

Compared to male Hispanics, female Hispanics did not understand their kidney disease or symptoms related to ESRD, as evidenced by higher scores in the *illness coherence* dimension (13.1 ± 4.7 vs. 10.8 ± 2.7, $t = 2.55$, $p = 0.014$). Female Filipinos had higher scores in the *personal control* dimension (for example, patients did not believe they could improve their medical condition, 15.2 ± 3.3 vs. 11.7 ± 2.7, $t = -2.274$, $p = 0.041$). Filipinos with shorter maintenance hemodialysis vintage (36 months or less) perceived more negative consequences of the illness, such as financial hardships and difficulties in family or social role, as reflected in higher scores in the *consequences* dimension (26.2 ± 1.1 vs. 22.0 ± 2.6, $t = 3.879$, $p = 0.002$). Male Koreans had higher scores in the *illness coherence* dimension (lower understanding of their medical condition, 12.2 ± 7.1 vs. 7.8 ± 4.4, $t = -2.497$, $p = 0.017$) than female Koreans. Younger Koreans (under age 65) believed in the chronicity of ESRD more than older Koreans (age 65 or older), as represented by higher scores in *timeline (acute/chronic)* (11.7 ± 4.4 vs. 8.9 ± 4.6, $t = 2.027$, $p = 0.049$).

Correlation Between Illness Perceptions and Clinical Variables According to Race/ Ethnicity

The Pearson's correlation matrix between variables is presented according to race/ethnicity from Tables 3 to 6. *Identity* was negatively correlated with age ($r = -0.323$, $p < 0.05$) and co-morbidity ($r = -0.322$, $p < 0.05$) in Korean-Americans, implying older patients and patients with fewer (number) co-morbidities complain of less physical symptoms. The *timeline (acute/chronic)* dimension was positively correlated with age ($r = 0.468$, $p < 0.01$) in Koreans. Older Koreans who have longer maintenance hemodialysis vintage perceive more strongly that their kidney disease is permanent. The *timeline* (cyclical) dimension was positively correlated with age ($r = 0.762$, $p < 0.01$) in Filipinos, which explain older Filipinos believe their illness is fluctuating.

The *consequence* dimension was negatively correlated with age in African Americans ($r = -0.405$, $p < 0.05$), suggesting that older African-American patients have a higher degree of perceptions of adverse consequences from the illness. The *personal control* dimension demonstrated a positive correlation with maintenance hemodialysis vintage in Filipinos and Hispanics ($r = 0.698$, $p < 0.01$; $r = 0.279$, $p < 0.05$, respectively), signifying that Filipinos and Hispanics with a longer dialysis history have more negative perceptions on the ability of personal intervention to control their illnesses. *Illness coherence* was negatively correlated with maintenance hemodialysis vintage in Filipinos ($r = -0.533$, $p < 0.05$), suggesting that Filipino patients with longer maintenance hemodialysis vintage have better knowledge about their illness. Emotional perception did not have any significant correlation with key clinical variables in any race/ethnicity.

Correlations between subdimensions of illness perceptions according to race/ethnicity were also evaluated. African Americans and Korean Americans with higher degrees of perceptions of illness chronicity had higher degrees of perceptions of adverse *consequences* of their illness ($r = 0.419$, $p < 0.01$; $r = 0.506$, $p < 0.01$, respectively). In addition, more physical symptoms were associated with a higher degree of perceptions of adverse consequences of the illness in Hispanics ($r = 0.368$, $p < 0.01$). African Americans who believed they could control their illness tended to complain less about physical symptoms ($r = -0.406$, $p < 0.05$). African Americans with more emotional distress perceived their illness was acute ($r = -0.415$, $p < 0.05$) and did not understand their medical condition (*illness coherence* dimension) ($r = 0.548$, $p < 0.01$).

Hispanic patients who believed their illness was more permanent had higher perceptions of illness chronicity ($r = 0.292$, $p < 0.05$). In addition, Hispanic patients who believed their illness was chronic had lower expectations of treatment efficacy ($r = 0.335$, $p < 0.01$). Hispanic patients who had more emotional distress had low understanding of their medical

condition ($r = 0.235$, $p < 0.05$), tended to have more physical complaints ($r = 0.516$, $p < 0.01$), and perceived of higher adverse consequences from their illness ($r = 0.390$, $p < 0.01$), as compared to Hispanic patients who had less emotional distress.

Discussion

This study was conducted to examine ethnic differences in illness perception among African Americans, Hispanics, Filipinos, and Koreans. Based on the demographic findings, most patients were of low socioeconomic status as reflected in high unemployment, low annual incomes, and low education levels. End stage renal disease is known to be more prevalent among individuals living in the lowest socioeconomic quartile (Ward, 2008). For this study sample, the primary causes of kidney failure were diabetes and hypertension, which also reflect the most common causes of kidney failure in the general U.S. population (U.S. Renal Data System [USRDS], 2011). Illness perception in ethnic minority groups within the maintenance hemodialysis population has not been studied in the past. Previous studies, including a previous study by the authors (Kim & Evangelista, 2010), suggested that illness perceptions might affect either adherence behavior or clinical outcomes in patients with ESRD undergoing maintenance hemodialysis. For example, Peterson and colleagues (1991) showed that cognitive depression and having negative perceptions about their illness are important indicators of grave prognosis in patients on maintenance hemodialysis ($n = 43$) or continuous ambulatory peritoneal dialysis. van Dijk and colleagues (2009) also reported that illness perceptions influence mortality rates in the ESRD population. In their study among 182 patients on maintenance hemodialysis or continuous ambulatory peritoneal dialysis, patients who had higher scores in the treatment control (patients who perceived their treatment as being less effective) assessed by IPQ-R showed higher mortality rates. In addition, the study by O'Connor and colleagues (2008) demonstrated that emotional distress and erroneous timeline perceptions about their illness assessed by IPQ-R negatively affected self-care behaviors with regard to diet and medication among patients with ESRD who were treated via hospital-based hemodialysis ($N = 73$). Furthermore, Karamanidou, Clatworthy, Weinman, and Horne (2008) showed that the intervention specifically targeted to modify illness perceptions could improve adherence behavior of patients with ESRD. In their study, a psycho-educational intervention improved adherence to taking phosphate-binding medications in a small group of patients on maintenance hemodialysis in a randomized controlled trial ($n = 19$ in intervention group and $n = 20$ in control group). Therefore, a better understanding of factors associated with illness perceptions is needed given the possible link of these factors to treatment adherence and mortality in the maintenance hemodialysis population.

This study revealed that emotional perception scores were highest in Koreans and lowest in African Americans. This implies that Koreans were more emotionally affected by their condition than African Americans; however, the reason why more Korean patients report emotional distress is not clear. Hwa-Byung, a Korean culture-bound syndrome (literally translated as anger syndrome) indicates anger suppression that leads to physical and mental disturbances and may account for the current study's findings (Min, 2009). Unfortunately, no population-based or ethnic comparison studies that investigate emotional disturbances in Koreans with chronic illness currently exist. However, an association between negative health perception and depression has been reported among older Korean Americans who suffer from chronic illness (Jang, Chiriboga, Kim, & Cho, 2009; Jang, Kim, & Chiriboga, 2006). Of note, poverty (income less than $15,000) was highest in Koreans and lowest in African Americans in the current study population. This suggests a possibility whether poverty could be an important mediator of higher degrees of emotional distress in Koreans because low socioeconomic status has been shown as a factor in depression in the ESRD population (Cukor, Cohen, Peterson, & Kimmel, 2007).

Intriguingly, this study showed that *identity* was negatively correlated with age and co-morbidity in Korean Americans, implicating older patients and patients with more co-morbidities complain of fewer physical symptoms paradoxically. This finding may suggest that older Korean-Americans use their minds to try and control physical symptoms from their illness because Asians tend to view mind and body as integrated (Lin & Cheung, 1999).

African Americans had higher mean scores in the dimensions of *personal control* (15.7 ± 5.7, $F = 6.544$, p 0.001) and *treatment control* (15.1 ± 4.0, $F = 5.073$, $p = 0.002$), indicating that African Americans had higher negative perceptions of *personal intervention control* (for example, patients did not believe they could personally improve their medical condition) and medical treatment controlling their disease (for example, patients did not believe in medical treatment). This perception was more evident in African Americans with incomes less than $15,000 *(personal control)* and African Americans who were married or lived with partners *(treatment control)*. This finding may indicate that poverty can adversely affect patients' beliefs about self-control over the course of illness. The reason why having companionship in their lives may lead to disbeliefs about efficacy of treatment in African Americans is not clear. According to the study by Gregory, Way, Hutchinson, Barret, and Parfrey (1998), the individual on maintenance hemodialysis becomes more cognizant of an uncertain future by the demands on and sacrifices incurred by significant others. This phenomenon may occur because people become more aware of the nature of their illness (incurable) as they interact with significant others. However, accurate interpretation of these findings warrants further studies to address this issue. Finally, given the potentially harmful effects of negative illness perceptions on the course of illness, it will be interesting to assess in future studies whether a targeted intervention, such as reducing emotional distress through counseling in Korean Americans, can improve clinical outcomes, such as mortality.

Study Limitations

The following potential limitations should be considered when interpreting results from this study. First, the study utilized a cross-sectional study design. Certain illness perceptions may have been unnoticed, underreported, or unreported by patients (for example, recall/reporting bias). As with any cross-sectional study, causation cannot be inferred. Findings from this study merely support the association between illness perceptions and several demographic and clinical variables. Second, since study participants were recruited from eight dialysis centers in a specific geographic region of the United States, it is not clear whether findings can be generalized to all patients on maintenance hemodialysis. Additionally, Hispanic participants were assessed as a monolithic group. They might not be representative of the overall Hispanic population undergoing maintenance hemodialysis. Moreover, despite a shared language, marked differences among Hispanics with regard to their culture, history, lifestyle, and health-care outcomes exist and should be considered when conducting research with Hispanic Americans in future studies. Finally, there were small and unequal numbers among the race/ethnicity groups.

Conclusions and Clinical Implications

This study examined and compared racial/ethnic differences on illness perception in a sample of an ESRD population undergoing maintenance hemodialysis. The findings from this study may offer information to healthcare providers and researchers concerning how patients on maintenance hemodialysis from different ethnic backgrounds may perceive their kidney disease. This study showed a number of significant differences in illness perceptions according to minority status and sociodemographic variables, including age and maintenance hemodialysis vintage. The current study provides potentially useful information for developing and testing culturally sensitive approaches to improve clinical

outcomes in the maintenance hemodialysis population. Additional research to explore ethnic differences in illness perceptions using a larger population with more diverse ethnicities, including Caucasians, is warranted.

Acknowledgments

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Goal

To provide an overview of illness perceptions among minority patients with ethnic/racial differences undergoing maintenance hemodialysis.

Objectives

1. Explain illness perceptions among minority patients with ESRD undergoing maintenance hemodialysis from different racial/ethnic groups.

2. Identify differences in illness perceptions within various racial/ethnic groups according to sociodemographic (age, gender, income, marital status, education) and clinical characteristics (maintenance hemodialysis vintage).

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Patricia B. McCarley, MSN, RN, NP, disclosed that she is on the Consultant Presenter Bureau for Amgen, Genzyme, and OrthoBiotech. She is also on the Advisory Board for Amgen, Genzyme, and Roche and is the recipient of unrestricted educational grants from OrthoBiotech and Roche.

Table 1

Sociodemographic Data of Study Participants ($N = 161$)

Descriptor	African Americans ($n = 32$)	Hispanics ($n = 71$)	Filipinos ($n = 15$)	Koreans ($n = 43$)	All ($n = 161$)
Age (Years [Mean ± SD])	51.09 ± 13.8	55.0 ± 15.0	44.6 ± 13.1	65.0 ± 13.0	52.2 ± 15.5
Gender	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Male	18 (56.2)	36 (50.7)	9 (60.0)	28 (65.1)	91 (56.5)
Female	14 (43.8)	35 (49.3)	6 (40.0)	15 (34.9)	70 (43.5)
Education					
High school or less	10 (31.3)	58 (81.7)	3 (20.0)	19 (44.2)	90 (55.9)
Some college	11 (34.3)	10 (14.1)	2 (13.3)	6 (14.2)	29 (18.0)
College graduate or more	11 (34.3)	3 (4.2)	10 (66.7)	18 (41.8)	42 (26.1)
Marital Status					
Never married	11 (34.4)	29 (40.8)	1 (6.7)	4 (9.3)	45 (28.0)
Married	8 (25.0)	32 (45.1)	11 (20.0)	18 (41.9)	72 (44.7)
Separated, divorced, widowed	13 (40.6)	10 (14.1)	3 (20.0)	21 (48.8)	44 (27.3)
Currently Employed					
Yes	4 (12.5)	16 (22.5)	1 (6.7)	2 (4.7)	23 (14.3)
No	28 (87.5)	55 (77.5)	14 (93.3)	41 (95.3)	138 (85.7)
Annual Income					
Less than $15,000	13 (40.6)	53 (75.7)	11 (73.4)	37 (86.0)	114 (70.8)
$15,000 to $60,000	17 (53.1)	17 (23.9)	4 (26.6)	6 (14.0)	44 (27.3)
Over $60,000	2 (6.3)	1 (1.4)	0 (0.0)	0 (0.0)	3 (1.9)
Causes of Kidney Failure					
Diabetes	9 (28.1)	25 (35.2)	6 (40.0)	30 (69.8)	70 (43.5)
Hypertension	13 (40.6)	20 (28.2)	4 (26.7)	7 (16.3)	44 (27.3)
Glomerulonephritis	1 (3.1)	6 (8.5)	1 (6.7)	0 (0.0)	8 (5.0)
Others	3 (9.4)	12 (16.9)	2 (13.3)	1 (2.3)	18 (11.2)
Unknown	6 (18.8)	8 (11.3)	2 (13.3)	5 (11.6)	21 (13.0)
Maintenance Hemodialysis Vintage					
Range (months)	3 to 307	3 to 237	11 to 116	3 to 281	3 to 307

Descriptor	African Americans (*n* = 32)	Hispanics (*n* = 71)	Filipinos (*n* = 15)	Koreans (*n* = 43)	All (*n* = 161)
3 to 36 months	19 (59.3)	33 (46.5)	7 (46.7)	23 (53.5)	82 (50.9)
37 to 60 months	6 (18.8)	14 (19.6)	5 (33.3)	8 (18.6)	33 (20.5)
More than 60 months	7 (21.9)	24 (33.9)	3 (20.0)	12 (27.9)	46 (28.6)
Duration of Hemodialysis Sessions					
3 to less than 4 hours	20 (62.5)	49 (69.0)	6 (40.0)	40 (93.3)	115 (71.4)
4 hours	12 (37.5)	22 (31.0)	9 (60.0)	3 (7.0)	46 (28.6)

Table 2

Mean Differences (Mean ± SD) in Illness Perceptions Between African Americans, Hispanics, Filipinos, and Koreans

IPQ-R Subscale (Number of Items)	Possible Score Range	African Americans (n = 32)	Hispanics (n = 71)	Filipinos (n = 15)	Koreans (n = 43)	F Statistic	p Value
Identity Dimension							
Identity (14)	1 to 14	6.25 ± 3.68	6.76 ± 3.72	6.60 ± 4.39	5.26 ± 2.79	1.659	0.178
Control Dimension							
Timeline (Acute/Chronic) (6)	6 to 30	21.03 ± 5.28	21.04 ± 4.75	20.40 ± 3.80	22.23 ± 6.28	0.688	0.560
Timeline (Cyclical) (4)	4 to 20	10.56 ± 4.30	12.34 ± 4.53	12.67 ± 2.02	10.16 ± 4.65	3.076	0.029
Consequences (6)	6 to 30	23.59 ± 4.93	22.31 ± 5.12	23.40 ± 2.80	22.79 ± 5.69	0.549	0.649
Personal control (6)	6 to 30	15.72 ± 5.66	12.58 ± 3.72	13.07 ± 3.33	11.14 ± 4.99	6.544	**<0.001** [a]
Treatment control (5)	5 to 25	15.12 ± 4.00	12.06 ± 4.05	12.33 ± 3.94	11.42 ± 5.08	5.073	**0.002** [b]
Illness coherence (5)	5 to 25	11.22 ± 4.48	11.92 ± 3.93	11.87 ± 3.38	10.65 ± 6.57	0.645	0.587
Emotional perceptions (6)	6 to 30	15.97 ± 6.32	18.73 ± 4.15	18.42 ± 5.86	20.37 ± 6.59	3.274	**0.023** [c]

Notes: Higher scores of *identity* = complaining of more physical symptoms. Higher scores on the dimensions of *timeline* and *consequences* = higher degree of perceptions of chronicity and adverse consequences of the illness. Higher scores on the *personal* and *treatment control* dimensions = higher degree of negative perceptions on personal intervention or medical treatment. Higher scores on the *coherence* dimensions = lower understanding of their medical condition. Higher scores on *emotional perceptions* = higher degree of emotional distress due to the illness. *Post-hoc analysis* was done to determine group differences:

[a] Statistically significant between African Americans and Hispanics (*p* = 0.007) at the 0.05 level.

[b] Statistically significant between African Americans and Hispanics (*p* = 0.006) at the 0.05 level.

[c] Statistically significant between African Americans and Koreans (*p* = 0.0011) at the 0.05 level.

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Table 3

Pearson's Correlational Matrix of Key Variables in African Americans ($n = 32$)

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Age											
2. Years of education	−0.075										
3. Co-morbidity	0.729**	0.352									
4. Maintenance hemodialysis vintage	−0.040	−0.251	0.071								
5. Identity	−0.203	−0.048	0.121	0.230							
6. Timeline (Acute/Chronic)	−0.080	0.199	0.359	0.093	0.712**						
7. Timeline (Cyclical)	−0.185	−0.341	−0.162	0.113	0.065	0.119					
8. Consequences	−0.405*	0.255	0.001	0.096	0.280	0.419*	−0.149				
9. Personal control	0.330	−0.099	0.159	−0.208	−0.406*	−0.340	−0.348	−0.053			
10. Treatment control	0.316	−0.297	0.198	−0.006	−0.324	−0.153	−0.046	0.130	0.444*		
11. Illness coherence	0.129	−0.191	−0.179	−0.288	−0.171	−0.199	0.184	−0.247	0.066	−0.189	
12. Emotional perceptions	−0.225	−0.120	−0.305	−0.100	−0.234	−0.415*	0.024	−0.037	0.188	−0.104	0.548**

Notes: Numbers 5 to 12: The illness perception scores (higher illness perception scores reflect stronger negative perceptions about illness); co-morbidity = Modified Charlson co-morbidity scores were used.

**
Correlation is significant at the 0.01 level (2-tailed).

*
Correlation is significant at the 0.05 level (2-tailed).

Table 4

Pearson's Correlational Matrix of Key Variables in Hispanics ($n = 71$)

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Age											
2. Years of education	-0.309**										
3. Co-morbidity	0.692**	-0.171									
4. Maintenance hemodialysis vintage	-0.017	0.120	-0.234*								
5. Identity	0.061	-0.005	0.158	0.150							
6. Timeline (Acute/Chronic)	0.234	-0.066	0.090	0.228	0.026						
7. Timeline (Cyclical)	0.051	-0.084	0.084	0.053	0.566**	0.063					
8. Consequences	0.228	0.039	0.135	-0.079	0.368**	0.175	0.434**				
9. Personal control	0.135	-0.157	-0.021	0.279*	0.165	0.292*	-0.046	0.086			
10. Treatment control	-0.144	-0.068	-0.165	.0186	0.150	0.335**	0.179	-0.100	0.359**		
11. Illness coherence	0.083	-0.174	0.035	-0.020	0.357**	0.041	0.276*	0.251*	0.297*	0.343**	
12. Emotional perceptions	-0.092	0.058	0.120	-0.084	0.516**	-0.035	0.405**	0.390**	0.019	-0.088	0.235*

Notes: Numbers 5 to 12: The illness perception scores (higher illness perception scores reflect stronger negative perceptions about illness); co-morbidity = Modified Charlson co-morbidity scores were used.

**
Correlation is significant at the 0.01 level (2-tailed).

*
Correlation is significant at the 0.05 level (2-tailed).

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Table 5

Pearson's Correlational Matrix of Key Variables in Filipinos ($n = 15$)

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Age											
2. Years of education	−0.244										
3. Co-morbidity	0.699**	−0.292									
4. Maintenance hemodialysis vintage	0.034	0.140	−0.381								
5. Identity	−0.113	0.242	−0.126	0.070							
6. Timeline (Acute/Chronic)	−0.296	−0.054	−0.030	0.130	0.135						
7. Timeline (Cyclical)	0.078	0.023	0.454	−0.762**	−0.016	−0.223					
8. Consequences	−0.497	0.242	−0.171	−0.178	−0.050	0.462	−0.227				
9. Personal control	0.059	0.281	−0.250	0.698**	0.212	0.122	−0.559*	−0.141			
10. Treatment control	0.258	−0.029	−0.141	0.325	−0.157	0.177	−0.370	−0.013	0.467		
11. Illness coherence	0.228	−0.030	0.475	−0.533*	−0.139	−0.241	0.641*	−0.206	−0.501	−0.082	
12. Emotional perceptions	0.157	0.343	0.277	−0.426	0.143	0.025	0.346	0.096	−0.102	211	0.359

Note: Numbers 5 to 12: The illness perception scores (higher illness perception scores reflect stronger negative perceptions about illness); co-morbidity = Modified Charlson co-morbidity scores were used.

**
Correlation is significant at the 0.01 level (2-tailed).

*
Correlation is significant at the 0.05 level (2-tailed).

Table 6

Pearson's Correlational Matrix of Key Variables in Koreans ($n = 43$)

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Age											
2. Years of education	−0.209										
3. Co-morbidity	0.788 **	−0.213									
4. Maintenance hemodialysis vintage	0.190	0.101	−0.001								
5. Identity	−0.323 *	−0.031	−0.322 *	0.124							
6. Timeline (Acute/Chronic)	0.468 **	−0.224	0.253	0.251	−0.159						
7. Timeline (Cyclical)	−0.242	0.046	−0.197	0.195	0.267	−0.208					
8. Consequences	0.194	−0.257	0.084	−0.054	−0.028	0.506 **	−0.163				
9. Personal control	0.186	−0.144	0.096	0.030	−0.129	−0.031	0.119	−0.261			
10. Treatment control	0.149	−0.149	0.006	0.216	0.129	0.238	−0.022	−0.020	0.310 *		
11. Illness coherence	0.000	0.310	−0.060	−0.038	−0.077	−0.391 **	0.201	−0.122	0.284	−0.125	
12. Emotional perceptions	0.010	−0.107	−0.066	−0.039	0.320	201	−0.164	0.360 *	−0.007	−0.157	0.015

Notes: Numbers 5 to 12: The illness perception scores (higher illness perception scores reflect stronger negative perceptions about illness); co-morbidity = Modified Charlson co-morbidity scores were used

**

Correlation is significant at the 0.01 level (2-tailed).

*

Correlation is significant at the 0.05 level (2-tailed).