



## The role of personal characteristics in the relationship between health and psychological distress among kidney transplant recipients

Torben Schulz<sup>a</sup>, Jan Niesing<sup>b</sup>, Roy E. Stewart<sup>a</sup>, Ralf Westerhuis<sup>c</sup>, Mariet Hagedoorn<sup>a</sup>, Rutger J. Ploeg<sup>b</sup>, Jaap J. Homan van der Heide<sup>d</sup>, Adelita V. Ranchor<sup>a,\*</sup>

<sup>a</sup> Department of Health Sciences, University Medical Center Groningen, University of Groningen, Groningen, The Netherlands

<sup>b</sup> Department of Abdominal Surgery, University Medical Center Groningen, Groningen, The Netherlands

<sup>c</sup> Dialysis Center Groningen, Groningen, The Netherlands

<sup>d</sup> Department of Internal Medicine, Academic Medical Center Amsterdam, Amsterdam, The Netherlands

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### ABSTRACT

Although kidney transplantation improves overall quality of life and physical functioning, improvements of psychological distress are often modest. However, apparent stressors such as comorbidity are only weakly associated with psychological distress and their impact differs considerably between patients. Wilson and Cleary proposed a theoretical model to explain these relationships. This model has been supported by research, but has never been applied in a population of kidney transplant recipients. Findings of the current study are based on a cross-sectional study carried out in 2008 in the northern Netherlands. An elaborated version of Wilson and Cleary's model specifying hypothesized relationships of objective health, functional status, subjective health, personal characteristics and psychological distress was evaluated with structural equation modelling. After elimination of non-significant paths the final model provided a good fit for the data,  $X^2(2) = 4.23$ ,  $p = 0.12$ ;  $RMSEA = 0.047$ ,  $CI_{RMSEA}(0; 0.11)$ ;  $ECVI = 0.060$ ,  $ECVI_{sat} = 0.059$ . Results suggest that objective health has an indirect effect on psychological distress, in size comparable to the effects exerted by functional status and subjective health. Personal characteristics are the strongest determinant of psychological distress, but are directly and indirectly affected by objective health. Results indicate that poor health might cause psychological distress by increasing coping demands while simultaneously decreasing coping resources.

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### Introduction

Despite its undisputable merits as a treatment for end stage renal disease, dialysis is associated with reduced quality of life on physical and psychological dimensions of quality of life (Arenas et al., 2007; Chilcot, Wellsted, Da Silva-Gane, & Farrington, 2008; Cukor, Coplan, Brown, Peterson, & Kimmel, 2008; Johansen, 1999). Kidney transplantation improves physical dimensions of quality of life and is associated with better physical functioning and higher overall ratings of quality of life (Burra & De Bona, 2007; Dobbels, De Bleser, De Geest, & Fine, 2007; Liem et al., 2007). However, with few exceptions (Cameron, Whiteside, Katz, & Devins, 2000; Franke et al., 2000), improvements on psychological dimensions of quality of life are reported to be modest or non-existent (Dew et al., 1997; Dobbels et al., 2007; Landreneau, Lee, & Landreneau, 2010; Liem et al., 2007;

Ogutmen et al., 2006; Overbeck et al., 2005). These findings suggest that even after successful kidney transplantation, patients experience reduced well-being and increased psychological distress (Dobbels et al., 2008). Addressing psychological distress is relevant to improve patient well-being and might also have positive secondary effects on adherence, morbidity and mortality (Achille, Ouellette, Fournier, Vachon, & Hebert, 2006; Cukor, Rosenthal, Jindal, Brown, & Kimmel, 2009; Dew et al., 2000; Khalil & Frazier, 2010; Khalil, Lennie, & Frazier, 2010; Lundberg, 2006).

While psychological distress has numerous causes, health-related stressors can be expected to play an important role for its manifestation in a chronically ill population such as recipients of a kidney transplant. The prevalence of medical conditions related to cardiovascular disease is high among patients with end stage renal disease (Athienites et al., 2000; Foley, 2003, 2006; Khan, 1998; Levin, 2003) and prolonged immunosuppressive treatment after transplantation is associated with the development of new medical conditions, such as malignancies, diabetes and infections (Kauffman, 2006; Kauffman, Cherikh, McBride, Cheng, & Hanto, 2006; Luan, Langewisch, & Ojo, 2010; Luan, Steffick, & Ojo, 2011; Ojo, 2006; Parasuraman, Yee, Karthikeyan, & del Busto, 2006).

\* Corresponding author. University Medical Center Groningen, Department of Health Sciences, HPC FA12, Antonius Deusinglaan 1, POB 196, 9700 AD Groningen, The Netherlands. Tel.: +31 503636120; fax: +31 503632406.

E-mail address: [a.v.ranchor@umcg.nl](mailto:a.v.ranchor@umcg.nl) (A.V. Ranchor).

However, kidney transplant recipients with higher disease burden (i.e., more comorbidity) will not necessarily be more distressed. Research has found that associations between psychological distress and objective markers of health such as the number of medical conditions are weaker than might be anticipated (Kempen, Jelicic, & Ormel, 1997; Kempen, Ormel, Brilman, & Relyveld, 1997; Koopmans & Lamers, 2005; Paukert et al., 2010; Saevareid, Thygesen, Nygaard, & Lindstrom, 2007; Thygesen, Saevareid, Lindstrom, & Engedal, 2009). These observations can be understood within the theoretical framework of the conceptual model of patient outcomes proposed by Wilson and Cleary (1995). According to their model, objective health does not have a direct influence on psychological distress. Instead, the basic structure of their model suggests that the influence of objective health on psychological distress is mediated by functional status and subjective health, the latter having a direct impact on psychological distress.

Research in elderly populations, as well as patients with cancer, Parkinson's disease, heart disease, and HIV has corroborated most of the relationships specified in Wilson and Cleary's model (Chrischilles, Rubenstein, Voelker, Wallace, & Rodnitzky, 2002; Lee, Yu, Woo, & Thompson, 2005; Sousa & Kwok, 2006; Sullivan, Kempen, Van Sonderen, & Ormel, 2000; Ulvik et al., 2008; Wettergren, Bjorkholm, Axdorph, & Langius-Eklof, 2004). It was found that objective health is related to functional status and that functional status is related to subjective health (Arnold, Ranchor, Koeter, de Jongste, & Sanderman, 2005; Bayliss, Ellis, & Steiner, 2005; Bentsen, Henriksen, Wentzel-Larsen, Hanestad, & Wahl, 2008; Flynn et al., 2009; Schneider et al., 2004; Sullivan et al., 2000). Studies have also shown that subjective health is associated with psychological distress and well-being (Cappeliez, Sèvre-Rousseau, Landreville, & Prévaille, 2004; Kelley, Whitley, Sipe, & Yorker, 2000; Schneider et al., 2004). However, relationships not specified in the model have also been observed. Some studies report direct effects of objective health on subjective health and psychological distress (Cappeliez et al., 2004; Gadalla, 2009a; Saevareid et al., 2007; Schneider et al., 2004; Sullivan et al., 2000). Other studies describe direct effects of functional status on psychological distress (Deimling, Bowman, Sterns, Wagner, & Kahana, 2006; Janz et al., 2004; Norton et al., 2005).

Personal characteristics of patients are another reason for the modest association between objective health and psychological distress. According to cognitive adaptation theory, personal characteristics, more specifically mastery, optimism and self-esteem directly affect psychological distress (Taylor, 1983; Thoits, 2010). Wilson and Cleary's model suggests that personal characteristics affect psychological distress not only directly, but also indirectly by influencing functional status and subjective health. Research has confirmed that higher levels of personal characteristics such as perceived control over life (i.e. mastery), optimism and self-esteem

are associated with increased well-being and decreased psychological distress (Gadalla, 2009b; Janz et al., 2004; Pritchard, Wilson, & Yamnitz, 2007; Stiegelis et al., 2003). However, contrary to Wilson and Cleary's assumptions, evidence suggests that personal characteristics such as mastery are affected by objective health and functional status, not vice-versa (Norton et al., 2005; Penninx et al., 1996; Ranchor et al., 2010). These changes in turn have an impact on subjective health and psychological distress.

The aim of the current study is to identify pathways through which objective health affects psychological distress and to clarify how personal characteristics are shaped by objective health and determine psychological distress. This aim will be achieved by evaluating an adapted model of objective health and psychological distress elaborated from Wilson and Cleary's conceptual model of patient outcomes (Fig. 1) (Wilson & Cleary, 1995). In line with research evidence, the model allows for paths between non-adjacent variables, e.g. between objective and subjective health and between functional status and psychological distress (Deimling et al., 2006; Sullivan et al., 2000). Also, objective health and functional status are hypothesized to influence personal characteristics (Norton et al., 2005; Penninx et al., 1996; Ranchor et al., 2010).

This study is the first attempt to explicate pathways through which objective health affects psychological distress in a sample of kidney transplant recipients. Given the high prevalence of comorbidity among kidney transplant recipients, understanding how objective health affects psychological distress and what role personal characteristics play in this relationship is relevant to prevent and alleviate psychological distress in this population.

## Materials and methods

### Sampling procedures

From the hospital database patients were selected who had (a) received a kidney graft between 1st of January 1993 and 28th of April 2008, (b) were living with a functioning kidney graft at the time of data extraction, (c) were at least 18 years of age, and (d) had received a single-organ, kidney only transplant. This query resulted in a potential sample of 1036 patients. Non-respondents received a reminder after three and seven weeks. Data for this cross-sectional study were collected from June to September 2008. The Medical Ethical Committee of the University Medical Center Groningen approved of the study and the procedures.

### Sample

During data collection 22 patients were excluded due to the following exclusion criteria: (a) unknown address ( $N = 13$ ), (b)

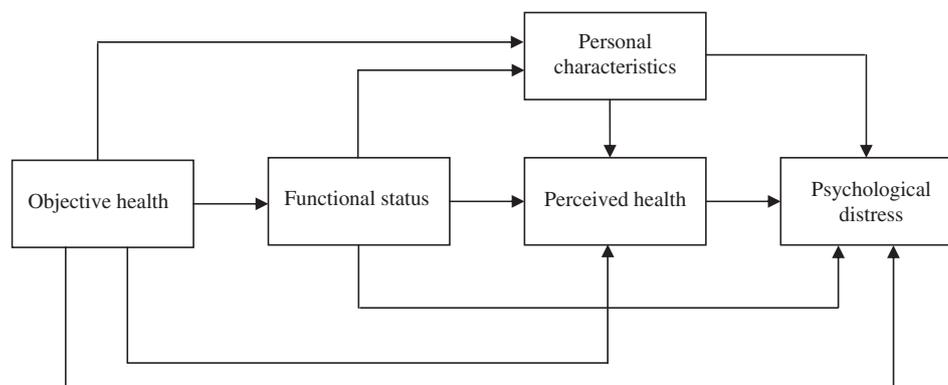


Fig. 1. Elaborated model of psychological distress based on Wilson and Cleary (1995).

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