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Measuring Patient Knowledge of Kidney Transplantation: An Initial Step to Close the Knowledge Gap

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Kidney transplantation is the preferred treatment modality for the majority of patients with end-stage renal disease (ESRD). Nevertheless, there are widely recognized disparities in access to each of the required steps preceding receipt of a kidney transplant, including provision of patient transplant education.¹ Limited transplant knowledge² and variability in the administration of patient transplant education have been found to contribute to disparities in access to transplantation.³ Furthermore, research has demonstrated a greater emphasis on the development of transplant education interventions to improve patient knowledge and informed decision making between ESRD treatment options.^{4,5} However, the literature is lacking in appropriate measures to examine the efficacy of these interventions on improving ESRD patient transplant knowledge early in the transplant process.

Although a validated scale exists to assess knowledge of kidney transplantation among waitlisted candidates and recipients,⁶ this tool has yet to be validated among ESRD patients not on the waitlist, a population likely to have lower transplant knowledge. It is challenging to know whether current researcher-developed metrics are appropriately measuring transplant knowledge for patients across the transplant care continuum. Scales that are assessed for validity or reliability using transplant candidate or recipient populations may not be generalizable in measuring their intended constructs (i.e., transplant knowledge) among ESRD patients who have yet to reach the kidney transplant waitlist. For example, administering these kinds of transplant knowledge scales may result in overestimates of patient knowledge early on in the transplant process, resulting in missed opportunities for prompt and targeted patient education. Furthermore, when examining the efficacy of education interventions in improving patient transplant knowledge, many of which target patients before waitlisting, it would be beneficial for researchers to use a validated scale that can be also be used with patients at these early steps. Ultimately, this would reduce bias when interpreting results, allow researchers to compare results across study sites and kidney

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disease populations, and improve researchers' ability to identify which interventions have the greatest effect on improving patient transplant knowledge and in turn, access to kidney transplantation.

The study by Peipert et al in this month's *Transplantation* aimed to investigate the validity and reliability of a newly developed Knowledge Assessment of Renal Transplantation (KART) scale in measuring transplant knowledge among adult ESRD patients at early steps in the transplant process: dialysis patients not yet evaluated for kidney transplantation, and ESRD patients presenting for evaluation at a transplant center.⁷ Scale items were developed and assessed for clinical relevance, validity, and comprehension by a multidisciplinary team of kidney disease experts, including a panel of dialysis patients and transplant recipients. Using extensive psychometric analyses of survey data collected from 2 prior studies in which the 15-item KART scale was administered, the authors found evidence of acceptable scale reliability (marginal reliability of 0.75). Furthermore, statistically significant differences in KART T-scores between patients that received various lengths of transplant education through multiple interventions provided evidence of validity, supporting KART's use among dialysis patients and patients presenting for transplant evaluation.

Valid and reliable scales, such as KART, could be vital tools for assessing transplant knowledge at earlier steps in the transplant process, allowing for more timely targeted education. At the dialysis facility level, KART scores could give providers an early indication of which patients would benefit most from targeted transplant education, such as enrollment in a peer mentoring program or access to transplant education videos while dialyzing, that extend beyond facility requirements mandated by the Centers for Medicare and Medicaid Services. Knowledge Assessment of Renal Transplantation could also be administered to ESRD patients presenting for evaluation at a transplant center, to intervene on patients who are undecided regarding available treatment options. To ensure all patients are appropriately educated, transplant providers could risk stratify patients based on KART scores to provide more targeted interventions, including shared decision aids or access to Web-based tools with additional educational resources for those with low knowledge.

There are several limitations to KART that should be addressed. First, it is unknown whether high KART scores are associated with increased access to transplantation in the absence of examining the efficacy of an educational intervention. Future studies are needed to examine correlations between KART scores and quantifiable transplant access outcomes, to justify the use of educational interventions aimed to increase transplant knowledge. Second, the educational level required for patients to complete KART is unknown, despite documented low health literacy among ESRD patients.⁸ Third, it is unclear how well this scale performs in testing patients repeatedly (test-retest reliability), as data used for psychometric analyses did not include patients who completed KART longitudinally. More evidence is needed to confirm that meaningful changes in knowledge measured by KART are not attributable to random error, given the tool's intended use for measuring efficacy of transplant education interventions.⁹ Fourth, the appropriate kidney patient population to target administration of KART is not fully known. Although both dialysis patients and transplant evaluation patients were included in the analysis cohort, these populations are likely to differ considerably in underlying transplant knowledge. Additionally, KART has not been tested in patients with

late-stage CKD or among transplant candidates and recipients. Finally, the study did not assess KART's performance when administered to dialysis facility staff, despite evidence suggesting low transplant knowledge among these providers.¹⁰

Overall, KART is a relevant tool for the kidney disease community to help identify gaps in patient transplant knowledge and to make informed decisions about the implementation of interventions for patients with low transplant knowledge and at early stages in the transplant process. Dialysis and transplant facilities should consider using KART in their respective institutions to increase provider awareness about the range in transplant knowledge among their patient population, and to identify at which step in the transplant process patients are most in need of additional educational resources. Knowledge Assessment of Renal Transplantation could help to inform use of more targeted educational interventions to supplement routine patient care, which may improve access to kidney transplant.

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