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Global Kidney Nutrition Care and Health Literacy: Overcoming the Disparities in Renal Nutrition Service Capacity and Education



MORE THAN THREE-QUARTERS of a billion adults have chronic kidney disease (CKD) worldwide; and data suggest that by 2040, CKD will become the fifth leading cause of death globally.¹ Whereas effective pharmacotherapy is important to slow disease progression in early and late CKD, also known as secondary and tertiary prevention,² nutritional and dietary interventions are among core components of kidney care.^{3,4} Given the enormous burden of kidney disease, combined with global disparities in kidney care and poor outcomes of kidney failure, the *World Kidney Day* joint steering committee has declared 2022 as the year of health literacy and education in kidney care with the motto “Kidney Health for All—Bridging the Gap in Kidney Health Education and Literacy.”⁵ Improving health literacy in kidney care enables better access to and utilization of kidney health services with worldwide accessibility of nutrition care for kidney disease as an important goal, given that optimal nutrition has a profound impact on kidney health and survival.⁶

A recent joint publication by the *International Society of Renal Nutrition and Metabolism* (ISRNM) and the *International Society of Nephrology* (ISN) has highlighted the role of nutrition intervention in kidney disease management worldwide to better understand the current global availability and capacity of kidney nutrition care services, interdisciplinary communication, and availability of oral nutrition supplements.⁷ In this study, the ISRNM, working in partnership with the *ISN Global Kidney Health Atlas* Committee, developed the *Global Kidney Nutrition Care Atlas* and administered an electronic survey among key kidney care stakeholders through 182 ISN-affiliated countries between July and September 2018.⁷ The investigators reported that while 160 of 182 countries responded, of which 155 countries answered the survey items related to kidney nutrition care, only 48% of the 155 countries have renal dietitians to provide this specialized service. Dietary counseling, provided by a person trained in nutrition,

was generally not available in 65% of low-/lower middle-income countries and “never” available in 23% of low-income countries. The availability of oral nutrition supplements varied globally and, mostly, were not freely available in low-/lower middle-income countries for both inpatient and outpatient settings. Among additional findings was that dietitians and nephrologists only communicated “sometimes” on renal nutrition care in 60% of countries globally.⁷ The collaborative ISRNM-ISN survey reveals meaningful disparities in global kidney nutrition care service capacity, availability, cost coverage, and deficiencies in interdisciplinary communication on renal nutrition care delivery, especially in lower income countries.⁷

These remarkable data suggest that the field of renal nutrition is significantly affected by global inequalities in kidney care that include racial disparities in many regions of the world, notwithstanding recent efforts to overcome and end vestiges of structural racism in medicine and kidney health.⁸ Several targeted measures can be considered to improve these gaps that may stem from deficiencies in health literacy related to renal nutrition. First, there should be more studies on the potential benefits of plant-based diets with expanded research on the role of plant-dominant and plant-focused diet plans on gut microbiome and beyond.^{9–11} Second, culinary medicine should be examined more extensively as a potential core component of the *Medical Nutrition Therapy* for kidney health and disease¹² including in diabetic kidney disease.¹³ Third, such educational and inspirational project as the “World Kidney Recipes” should be promoted to team up globally to empower patients and their care partners as well as renal dietitians and chefs with culinary creativity and multicultural diversity in renal nutrition and dietetics worldwide.¹⁴ Fourth, higher emphasis should be devoted to identification and management of protein-energy wasting, cachexia, and sarcopenia in those with preexisting CKD,^{15,16} and these efforts should parallel examining the role of *Precision Nutrition* and personalized diet plan for kidney health and kidney disease management.¹⁷ Finally, patient and care partner empowerment should be an important goal under the “Kidney Health for Everyone Everywhere.”¹⁸ Under the ongoing coronavirus disease 2019 (COVID-19) pandemic, these goals and visions should be well adjusted to address the questions related

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to nutrition and diet as they pertain to prevention and treatment of COVID-19 in those with kidney disease or at risk of kidney disease.^{19,20} To that end, the role of renal telenutrition to leverage telehealth and telemedicine for nutritional assessment and dietary management of persons with kidney disorders becomes even more important under COVID-19 pandemic conditions.²¹

In line with addressing the concern of lack of access to dietitians trained in renal nutrition, in this issue of the *Journal*, Kopple et al.²² describe an internet program for educating dietitians around the world on the topics of renal nutrition to enhance their knowledge for delivering care for patients with kidney disease. The Global Renal Internet Course for Dietitians is available fully online in anticipation that providing professional education on renal nutrition will expand access for patients with kidney disease to dietitians trained to their needs.

Hamedi-Kalajahi et al.²³ examined the use of L-carnitine supplementation in children having maintenance dialysis therapy. Children randomly received L-Carnitine or placebo for 10 weeks, and markers of inflammation were measured. Serum interleukin-6 and fasting blood sugar decreased while no change was observed in serum albumin or high-sensitivity C-reactive protein.

Acute kidney injury was examined by Wu et al.²⁴ using bioimpedance to evaluate fluid status during a course of continuous renal replacement therapy. This unique study determined that using the ratio of overhydration and extracellular water as well as the ratio of extracellular water and body cell mass as volume status tools were predictors of morbidity and mortality outcomes.

A number of articles in this issue of the *Journal* address the needs of patients with CKD not yet on dialysis. Santana Gomes et al.²⁵ provide a systematic review on the incidence of sarcopenia and mortality in patients before starting dialysis. The articles represent data from more than 4,000 patients in whom the prevalence of sarcopenia ranged from 6% to 62% and identify a 43% increased risk of mortality associated with sarcopenia. Windahl et al.²⁶ report on the EQUAL study and patient-reported outcomes. Their work identified that patients who reported lower physical function, more gastrointestinal symptoms, and those who were smokers had higher risk of developing malnutrition during the year of follow-up. These patient-reported outcomes are signals that conditions will worsen if left unchecked. Eyre et al.²⁷ critique the use of multifrequency bioimpedance spectroscopy in late-stage CKD for body composition assessment using whole-body dual-energy x-ray absorptiometry as standard. Their work identified that bioimpedance was only moderately accurate for estimating the fat-free mass index. Ding et al.²⁸ identified a relationship between phosphate overload and vascular calcification. Their research identified an association between hyperphosphatemia and tumor necrosis factor- α and increased inflammation. Mozaffari-

Rad et al.²⁹ examined the use of phosphorus restricted diet on proteinuria in CKD. Restricting phosphorus intake to <12 mg/kg ideal body weight/day did not result in reduced proteinuria when compared with an isocaloric diet without phosphorus restriction.

Notaras et al.³⁰ report on the cost of building a predialysis clinic for delivering medical nutrition therapy. They report that patients receiving dietary counseling had fewer hospital admissions and, while not influencing total costs, dietary counseling was associated with a lower cost per day than no dietary counseling. Iocca et al.³¹ contrived a way to include ice cream in the renal diet to aid in increasing energy intake while holding phosphorus low. Kimura et al.³² provide a prediction equation for estimating 24-hour urinary creatinine that includes a creatinine-based estimate of kidney function, age, sex, height, and weight and operates across a wide range of kidney function. The patient education piece provided in this issue of the *Journal* is a guidance developed by Ives³³ regarding gastroparesis with tips for managing their gastroparesis in view of also having kidney disease.

Reports on studies in patients receiving maintenance hemodialysis examine dietary intake, natriuretic peptides for predicting protein energy wasting, the advice of medical directors regarding dietary protein intake from the Dialysis Outcomes and Practice Patterns Study, and dietary factors associated with sleep quality. Song et al.³⁴ compared dietary intake patterns between patients from the United Kingdom and China. Whereas dietary intake of patients was comparable for some parameters and different for others between these 2 large countries, the study emphasizes the overall low dietary energy, protein, calcium, and vitamin C intake of patients requiring hemodialysis. Natriuretic peptides were examined in a group of hemodialysis patients by Luce et al.³⁵ They compared N-terminal pro-B-type natriuretic peptide and atrial natriuretic peptide with bioimpedance spectroscopy in a prospective study. Natriuretic peptides were associated with malnutrition and survival in these patients and deserve further research. Advice on increasing dietary protein intake as a tool for addressing hypoalbuminemia and hyperphosphatemia was examined by Yamamoto et al.³⁶ using data from the Dialysis Outcomes and Practice Patterns Study. Their evaluation indicates that medical director's advice to increase dietary protein was associated with higher serum creatinine and decreased mortality. Ho et al.³⁷ conducted a study on sleep quality of patients having maintenance dialysis. They found that more than half of the patients had poor sleep quality and was associated with some dietary factors.

The push to increase emphasis on nutrition and improved dietary habits for patients with kidney disease continues in this issue of the *Journal of Renal Nutrition*. It is a privilege to share the work of caring practitioners and scientists to improve nutrition for patients with

kidney disease around the world. Please be stimulated to improve the care of your patients with kidney disease and continue the quest for better kidney nutrition through research.

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