



Provider Attitudes and Support of Patients' Autonomy for Phosphate Binder Medication Adherence in ESRD

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Abstract

This cross-sectional study of 56 dialysis providers from 3 dialysis clinics examined providers' attitudes and perception of autonomy support for patients' medication adherence behaviors. Respondents completed surveys assessing attitudes and perception of autonomy support. Compared to all other provider types, physicians and nurse practitioners (MD/NP) thought it was "less true" that phosphate binder medications are very important for dialysis patients (MD/NP vs others: 5.1 [1.4] vs 6.1 [1.1]; $P = 0.02$). More dialysis technicians (19%) offered the highest level of support. Attitudes and perception of autonomy support for medication adherence are suboptimal, vary by dialysis provider type, and are targets for quality improvement in dialysis care. This study addresses critical gap in existing knowledge about these two novel provider-based psychosocial factors and their potential impact on phosphate binder medication adherence.

Keywords

provider attitudes, autonomy support, medication adherence, end-stage renal disease

Introduction

Hyperphosphatemia is associated with increased mortality and morbidity in end-stage renal disease (ESRD), and phosphate binder medications are a proven component of best care (1). Nonadherence to phosphate binders is as high as 75% and explained in part by psychosocial factors (2) such as patients' *attitudes or autonomous regulation* (3) and patients' perception of *autonomy support* from providers (4).

Autonomy support recognizes and acknowledges patients' attitudes, motivations, and behaviors and their influence on health outcomes. Patient-centered care best practices aligned with autonomy support include communication by providers that provides robust information and choices and advice without undue pressure or demand (5). This emphasizes an active engagement process between providers and patients and provides a basis for active counseling and shared decision-making, critical for effective management of kidney disease (5).

Autonomy support from providers reflects optimal communication, which correlates with better patient adherence in chronic disease management (6). It empowers patients and increases their confidence in self-care skills. Diabetic

patients' perception of providers as being autonomy supportive directly correlates with decreased glycosylated hemoglobin levels (5). This implies that a supportive and empowering health-care climate can foster desirable physiological outcomes among patients with chronic conditions (5). This is applicable in dialysis patients, amongst whom the perception of autonomy support from providers has been shown to associate with medication adherence (4). It underscores the potential of a patient-centered approach focused on understanding

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dialysis patients' perceptions in facilitating improvements in medication adherence and critical outcomes (4).

The World Health Organization emphasizes that provider factors of adherence are as important as patient determinants (7). Importantly, in diabetes and hypertension, providers' supportive beliefs in patients' control over their health strongly associate with better medication adherence and clinical outcomes (8). Little is known about dialysis providers' attitudes and perception of support for patients' autonomy. This study addresses this gap by examining these factors and their variation by provider type, critical to optimal medication adherence in dialysis.

Methods

We conducted a cross-sectional study in July 2016 of dialysis providers recruited from 3 dialysis clinics in Nashville, Tennessee. Providers received information about this study during clinic staff meetings and via e-mail. Participants were English-speaking physicians and nurse practitioners (14%), nurses (33%), dialysis technicians (31%), dietitians (7%), and social workers (3%). Participants completed a brief anonymous survey, and no compensation was offered. The local institutional review board approved this study as an exempted study.

The phosphate binder-specific version of the Health Care Climate Questionnaire (HCCQ-PB) (4,9) was adapted from a more generic instrument (available at: www.selfdeterminationtheory.org) to ask providers to self-assess their support for patients' phosphate binder medication adherence autonomy. It consisted of 6 questions assessing how much the providers paid attention to dialysis patients' preferences regarding phosphate binder use and whether consideration was given to patients' perspectives on phosphate binder use before making any changes to their phosphate binder prescription. The Cronbach's α of the HCCQ-PB in this study was 0.86, showing it was internally consistent. Providers' attitudes toward phosphorus binder therapy were assessed by 6 other items, covering topics such as rating the importance of phosphate binder therapy relative to other components of care, identifying who is responsible for educating patients on phosphate binder use as well as identifying nonadherence. These items had a Cronbach's α of 0.62 in this study. All survey responses were made on 7-point ordinal response scale with a maximum rating of 7 representing a "very true" response. Surveys were offered in person and electronically.

Descriptive analyses are presented as mean and standard deviation (SD) for continuous variables or proportions for categorical variables. The *t* test was used to test mean differences between physicians and nurse practitioners and other provider types. We categorized high attitudes as those with an overall score of 6 or 7, moderate attitudes (3, 4, or 5), and low attitudes (1 or 2). Using the chi-square test, we compared the percentage of respondents with high, moderate, or low scores for each item in the attitudes' questionnaire by type of provider. Similar to other scales that assess perceptions of care, high autonomy support

corresponds to an overall score of 7, and lower autonomy support corresponds with any overall score less than 7 (3). Some provider types were combined in groups in order to protect privacy.

Results

Among 56 dialysis providers (response rate: 86%), 62% were between the ages of 30 and 49 years; most were female (75%) and white (64%). Providers had cared for dialysis patients for an average of 11 years (SD: 9; range <1 year to 35 years). Compared to other types of dialysis providers, physicians and nurse practitioners (MD/NP) thought it was "less true" that phosphate binders are very important for dialysis patients' health (MD/NP vs others: 5.1 [1.4] vs 6.1 [1.1]; $P = .02$). Physicians and nurse practitioners also did not endorse phosphate binders as the most important medication for dialysis patients (4.0 [1.9] versus 5.8 [1.2]; $P < .005$). However, they felt more responsible for educating patients about phosphate binders (6.9 [0.4] vs 5.5 [1.7]; $P = .03$) and identifying phosphate binder nonadherence (6.6 [0.7] vs 5.5 [1.6]; $P = .05$), compared to other providers. Dietitians and social workers were less convinced than others that phosphate binders are more important than diet for phosphorus control (2.3 [1.2] vs 3.9 [1.9]; $P = .05$). More dialysis technicians felt that phosphate binders are more important than diet compared to other dialysis providers, 47% (technicians) vs 13% (MD/NP); 11% (nurses); and 0% (dietitians or social workers); $P = .03$ (Figure 1).

Autonomy support scores differed by provider type and by specific aspects of support (Table 1). Overall autonomy support was suboptimal; however, more dialysis technicians (19%) offered the highest level of support compared to the other provider categories. Only 25% of physicians and nurse practitioners reported "very true" for listening to how their patients like to do things with regard to their phosphate binders, while 50% reported trying to understand how their patients view phosphate binder therapy before making any changes. In general, providers had limited confidence in patients' ability to *make changes* regarding phosphate binder use (4.5 [SD 1.6]). Overall provider autonomy support score correlates strongly with provider attitude items including responsibility for educating patients about phosphate binders ($r = .40$; $P = .003$); confidence in skills to provide counseling ($r = .64$; $P < .005$); and responsibility for addressing nonadherence ($r = .69$; $P < .005$).

Discussion and Conclusion

Discussion

Dialysis providers have different attitudes and self-perceptions of support for dialysis patients' autonomy for phosphate binder adherence. This study highlights that physicians and nurse practitioners attach less importance to phosphate binder therapy, and all dialysis providers have limited confidence in their patients' ability to make changes

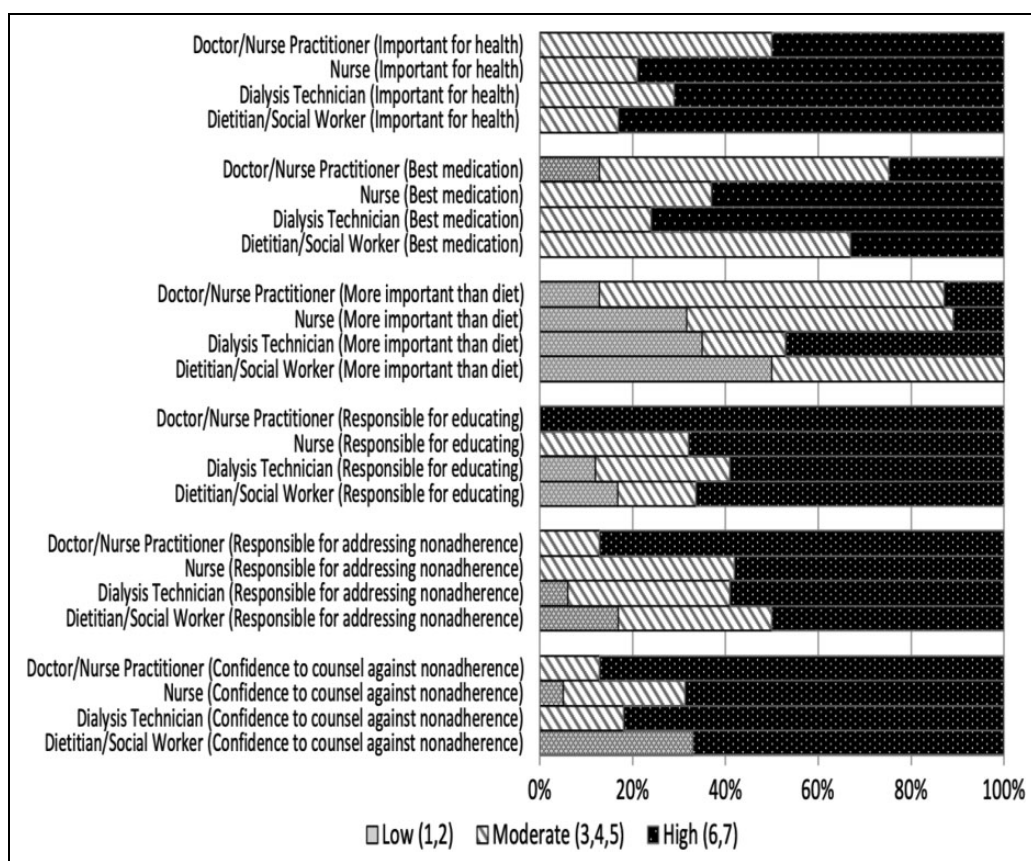


Figure 1. Provider attitude scores by provider type.

Table 1. Providers' Perception of Autonomy Support for Phosphate Binder Therapy.^a

Provider Health-Care Climate Questionnaire	All Providers, Mean (SD), Response (1–7)	Physician/Nurse Practitioner, n = 8	Nurse, n = 16	Dialysis Technician, n = 16	Dietitian/Social Worker, n = 6
Provision of options for phosphate binders	5.2 (1.7)	5.8 (1.2)	4.7 (1.7)	5.2 (1.8)	5.5 (2.4)
% Maximum score	28%	38%	19%	25%	50%
Respect for patients' autonomy	5.3 (1.4)	5.3 (1.5)	5.1 (1.3)	5.7 (1.3)	4.8 (1.7)
% Maximum score	22%	38%	13%	25%	17%
Confidence in phosphate binder management by patients	4.5 (1.6)	4.1 (1.9)	4.4 (1.4)	5.0 (1.8)	4.2 (1.7)
% Maximum score	13%	13%	6%	25%	0%
Listening to patients' views about phosphate binders	5.6 (1.3)	6.0 (0.8)	5.4 (1.1)	5.8 (1.3)	5.0 (2.0)
% Maximum score	24%	25%	13%	38%	17%
Encouragement to ask questions	6.0 (1.2)	6.0 (1.5)	5.9 (1.0)	6.1 (1.0)	5.7 (1.8)
% Maximum score	46%	63%	31%	50%	50%
Understanding patients' perspectives	5.8 (1.3)	6.0 (1.4)	5.7 (1.1)	6.1 (1.3)	5.2 (1.7)
% Maximum score	39%	50%	25%	56%	17%
Overall score	5.4 (1.1)	5.5 (1.0)	5.2 (1.0)	5.6 (1.1)	5.1 (1.5)
% Maximum score	11%	13%	6%	19%	0%

Abbreviation: SD, standard deviation.

^a% Maximum score means % responding 7.

regarding phosphate binder use. However, physicians still feel very responsible for educating patients.

Suboptimal provider endorsement and confidence in phosphate binder-related skills might be due to unresolved issues in

the evidence base informing phosphorus management in dialysis. The target serum phosphorus level itself is ambiguous (10). Recent international clinical practice guidelines advise that decisions about phosphate-lowering treatment should be

based on progressively or persistently elevated serum phosphate, and levels should be lowered toward the normal range. Although nearly all nephrologists agree that preventing very high phosphorus levels is appropriate, the lack of a designated target level may contribute to the variable importance and conflicting attitudes assigned to phosphate binders.

Variations in provider attitudes may contribute to several mechanisms that influence outcomes. In diabetes, positive provider attitudes about the benefits of achieving euglycemia correlate with patients' improved adherence to insulin therapy and better glycemic control (11). In kidney disease care, positive provider attitudes toward kidney transplantation correlate with higher numbers of potential transplant recipients on the waiting list of transplant facilities (12).

Provider attitudes have also been linked to more effective counseling and patient education. In primary care, favorable attitudes toward smoking cessation is linked with effective counseling and higher rates of smoking cessation (13). Education and counseling for phosphorus management are a cornerstone of care (14), and optimizing provider attitudes may be a strategy to improve their implementation.

Providers' perception of support for patients' autonomy is sub-optimal and could be due to providers' limited confidence in, or bias against, patients' autonomy for self-care. Providers highlight the dissociation between disease severity and symptoms, and the presence of treatment-related symptoms, as a hindrance to diabetic patients' ability to effectively engage in their self-care (15). Dialysis providers' limited support for patients' autonomy may be partly driven by the notion that patients lack appreciation for the gravity of hyperphosphatemia due to the absence of immediate dramatic symptoms and the presence of significant therapy-related burden, including side effects and high pill burden.

Conclusion and Practice Implications

This novel study highlights variations in provider perceptions, suggesting that improvement in phosphate binder medication adherence may require multi-component interventions tailored for different dialysis provider types within the multidisciplinary team. For instance, physicians and nurse practitioners will benefit from interventions aimed at increasing their support for patients' autonomy related to phosphate binder medication adherence. However, dialysis technicians will benefit more from interventions leveraging their high level of support for patients' autonomy to ensure consistent messaging for patients. Future research priorities include the need to test for associations between provider attitudes and perceptions of support for patients' autonomy and phosphate binder medication adherence and phosphorus control in dialysis.

Limitation

Unique provider perceptions are potential targets for improvement of patient-centered care in dialysis. Our data is from a limited number of dialysis clinics and should be

interpreted cautiously, however, the composition of provider types is similar to most dialysis units across the United States; thus, findings are generalizable.

Declaration of Conflicting Interests

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Author Biographies

Ebele M Umeukeje, MD, MPHDr, is an assistant professor of Medicine in the Division of Nephrology and Hypertension at Vanderbilt University Medical Center. She completed Internal Medicine training, including a year as Chief Resident, at Meharry Medical College, and completed Nephrology training at Vanderbilt University Medical Center. She advanced her training in patient-oriented research through the Master of Public Health Program at Vanderbilt University, in part supported by an NIDDK Ruth L. Kirschstein National Research Service Awards (NRSA) individual post-doctoral fellowship award. Umeukeje's research aims to reduce the high morbidity and mortality associated with kidney disease by improving self-care in vulnerable populations, addressing psychosocial determinants. Her research promotes health equity for patients of racial, ethnic and gender minorities as well as those with limited health literacy and lower socioeconomic resources. With previous funding support through a BIRCWH K12 award, and most recently, an NIDDK K23 award, Dr Umeukeje is examining novel patient and provider-specific psychosocial determinants of dialysis treatment adherence in African American patients with end-stage kidney disease. Her goal is to develop culturally-sensitive strategies to improve delivery of care and outcomes in advanced kidney disease.

Rabia Osman, BS, completed her undergraduate training at Vanderbilt University and is currently a 4th year medical student at the Ohio State University College of Medicine. Originally from Somalia, but raised in Nashville, Tennessee. She is currently applying to Emergency Medicine Residency Training Programs. Her interests include global health, health disparities, and medical education.

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Center (VUMC) Division of Developmental Medicine. Founder and director of VUMC's Office of Inclusion and Health Equity (OIHE) since 2011, Nettles has expanded the program from its origins at Monroe Carell Jr. Children's Hospital at Vanderbilt to encompass the entirety of the enterprise on cultural awareness, unconscious bias and Respect@Work: Sexual Harassment education and training. Nettles is a licensed psychologist; nationally certified school psychologist; nationally registered health service provider; and an alumnus of the Disparities Leadership Program. Appointed by the Governor, Nettles chairs the Tennessee Statewide Planning and Policy Council for the Department of Intellectual and Developmental Disabilities. Her current research is cultural competency in health care.

Kenneth A Wallston, professor of Nursing, Emeritus in his forty-plus years at Vanderbilt University, Kenneth A Wallston had been a professor of psychology in the School of Nursing, the College of Arts and Science, and Peabody College, and a professor of human and organizational development at Peabody. He had also been a Vanderbilt Kennedy Center associate member. His area of study concerns adaptation to illness, with particular interest in individual differences that predict health behaviors and status. One of the founders of health psychology, Professor Wallston has worked widely in the transdisciplinary arena termed behavioral medicine. He is known internationally for his research regarding the influence of individuals' beliefs in their ability to control their health on their health behavior and outcomes. In the 1970s, he and colleagues developed the Multidimensional Health Locus of Control (MHLC) scales, which are still used to assess belief and health status. Professor Wallston investigated the role of health literacy and numeracy in predicting behaviors and outcomes and he helped to develop the survey component of the national Precision Medicine Initiative. He has published more than 200 articles and book chapters and is a fellow of the American Psychological Association, the Society of Behavioral Medicine, and the Academy of Behavioral Medicine Research.

Kerri L Cavanaugh is an associate professor of Medicine within the Division of Nephrology and Hypertension at Vanderbilt University Medical Center. She is also a nephrologist with the Tennessee Valley Health System Veterans Affairs Medical Center. Dr Cavanaugh's research interests center around identifying factors influencing how patients learn about complex chronic disease and the translation of health information into effective self-care behaviors. This includes studying patient-related, provider-related and also patient-provider communication variables. She has demonstrated the risk related to limited health literacy and deficits in disease-specific knowledge among patients with moderate to advanced kidney disease, as well as developing and testing multi-level interventions to improve care. Dr Cavanaugh developed and made freely available novel valid measures to assess kidney knowledge, self-efficacy of self-care in kidney disease and self-management behaviors. These activities have been funded by the NIH, the American Society of Nephrology, and the National Kidney Foundation.