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Approaches to Obesity Management in Dialysis Settings: Renal Dietitian Perspectives

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Abstract

Objective: Over 40% of individuals with end-stage kidney disease in the United States have obesity. Little is known about renal dietitian perspectives on current practices of and barriers to obesity management in the setting of dialysis-dependence.

Design and Methods: An online 21-item survey was distributed to 118 renal dietitians via individual outreach and a professional organization e-mail listserv. Four themes were explored: the burden of obesity among dialysis patients, concepts of healthy weight loss, weight loss approaches, and challenges of obesity management in dialysis settings. Respondents were asked to rank approaches and biomarkers for obesity management in dialysis settings from 0 (least important or not used) to 100 (most important). Free text fields were provided in each category for additional comments.

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Results: Thirty-one renal dietitians responded to the survey (26% response rate). The majority of respondents (90%) indicated that access to kidney transplantation was the main reason that dialysis patients with obesity desired weight loss. Calorie restriction was rated as the most common weight loss approach, and dry weight as the most important weight loss biomarker. Nearly 40% of respondents do not alter their nutritional approach when dialysis patients with obesity are losing weight, and 42% of respondents do not monitor changes in waist circumference. Exercise, diet counseling, and stress management were variably prioritized as weight loss management strategies. Barriers to obesity management in dialysis settings included lack of time, lack of training in weight loss counseling, and gaps in current renal nutritional guidelines.

Conclusion: Despite the high prevalence of obesity among individuals with end-stage kidney disease, this pilot survey suggests that current approaches to obesity management in dialysis settings are variable. A lack of dedicated time to support volitional weight loss is a key barrier to obesity management in dialysis settings. Guidelines are needed to support people with dialysis-dependence and obesity who desire or require weight loss.

Keywords

Dialysis; Obesity; Nutrition; Weight Loss; Exercise

INTRODUCTION

The prevalence of obesity, defined by the World Health Organization as a body mass index [BMI] ≥ 30 kilograms [kg]/meters [m] squared for adults in the general population,¹ has been rising steadily among adults in the United States (US) with end-stage kidney disease (ESKD). In 2017, over 40% of US incident dialysis patients had a BMI of 30 kg/m^2 or higher.^{2,3} However, in contrast to the general population, in which obesity confers higher cardiovascular risks and increases the risk of death, obesity is associated with a survival advantage in ESKD (i.e., the “ESKD-related obesity paradox”⁴). Several biologic mechanisms could explain the reverse epidemiology of obesity in ESKD, including the benefits of higher muscle mass and nutritional stores in ESKD patients with obesity.^{4,5}

Despite data on the potential protection of higher body mass in ESKD, people with obesity and ESKD commonly desire weight loss for a variety of reasons, including improving health, increasing mobility, and accessing kidney transplantation.^{3,6–8} Yet, existing nutritional guidelines for dialysis patients, such as those from the National Kidney Foundation (NKF) Kidney Disease Outcomes Quality Initiative (KDOQI)⁹ and the Centers for Medicare/Medicaid Services Conditions of Coverage for End Stage Renal Disease,¹⁰ do not include strategies to monitor weight loss among obese individuals who are dialysis-dependent. Further, little information exists on the current strategies and challenges of obesity management in dialysis settings, despite the increasing prevalence of obesity in this patient population. Therefore, the purpose of this study was to examine renal dietitian perspectives on obesity management in ESKD, and to identify key areas for future research.

METHODS

We conducted a national pilot survey of renal dietitians. The survey link and introduction to the survey were sent to renal dietitians in the New England Chapter NKF renal dietitian listserv (n=93) and an additional 25 renal dietitians throughout the US by e-mail outreach. Survey respondents were asked to complete a 21-item survey, which included questions on the burden of obesity, concepts of healthy weight loss in dialysis settings, strategies for obesity management, and challenges of obesity management in clinical dialysis settings (see Supplement for complete survey). Respondents rated prevalent weight loss strategies and surrogates for evaluating weight loss on 100-point visual analogue scales,¹¹ with 0 being extremely uncommon and 100 being extremely common. Respondents also rated their comfort in managing volitional weight loss on a 100-point visual analogue scale (0=not comfortable, 100=comfortable). The survey was available for four weeks, and one reminder message was sent after two weeks.

RESULTS

Respondent Characteristics

Thirty-one renal dietitians across thirteen states responded to the survey (26% response rate). Over half (55%) of respondents were 51 years of age or older (Table 1). Respondents had a median of six years of experience in renal dietetics (interquartile range [IQR] 5–14 years) and had provided nutritional care for a median of 350 dialysis patients in their careers to date (IQR 200–850 patients).

Burden of Obesity in Dialysis Settings

Nearly 40% of respondents indicated that 50% or more of the dialysis patients under their care had obesity (i.e., BMI ≥ 30 kg/m²). Respondents rated access to kidney transplantation as the most common reason that dialysis patients with obesity tried to lose weight (90%). When asked how many of their patients with obesity successfully lost weight, 68% of respondents indicated $<10\%$. The most common approach was caloric restriction (median score 76, IQR 69–94), and the least common was medication to promote weight loss (median score 3, IQR 0–12) (Figure 1).

Approaches to Weight Loss Management

Renal dietitians detailed several approaches to support weight loss among patients with obesity on dialysis, including a focus on “mindful eating,” “exercise,” “education on healthy food choices despite food insecurity,” “food journaling,” and “portion control using the Myplate method.” Most respondents reported multiple methods, such as the recommendation of exercise (67%), change in diet (56%), and portion control (52%), as their main approaches in helping patients with obesity on dialysis to achieve healthy weight loss. Additionally, 26% of respondents listed “mindful eating” as another method of promoting weight loss among their dialysis patients. A minority of respondents (19%) also recommended counseling-based approaches to support healthy weight loss (e.g., “motivational interviewing”).

Surrogates for Volitional Weight Loss

Respondents most commonly monitor change in dry weight as a surrogate for weight loss (median score 85, IQR 79–96), followed by change in physical activity (median 83, IQR 76–98). Nearly 42% of respondents do not monitor changes in waist circumference with weight loss (Figure 2). In a free text section, respondents also reported monitoring “food access,” “social support,” and nutrition-focused physical exam for evidence of “temporal and interdigital wasting, arm and leg muscle wasting, loss of fat pads under eyes, hair loss, and slow healing” among patients with obesity on dialysis who are losing weight.

Perspectives about the Safety of Weight Loss in Dialysis Settings

In free text responses, renal dietitians described methods to monitor weight loss among patients with obesity on dialysis (Table 2). Diet recall reports, physical examination clues, lab results, and the rate of weight loss were the primary indicators of healthy weight loss. More than half of the respondents (59%) reported that they altered their standard nutritional monitoring approach when they observe that patients with obesity are losing weight. Respondents who altered their approach reported that they “make sure the patients are not losing weight in an “unhealthy way” and “check in more often with diet recalls.” Many respondents expressed concern about the potential impacts of weight loss on visceral protein stores, advising patients with obesity to increase protein intake when trying to lose weight, and cautioning patients “regarding the risk of decreasing visceral protein stores [with weight loss].” Other responses underscored the importance of distinguishing reasons for weight loss, including “[I] enter discussion with patients about how/why [weight loss] is occurring [and] pay more attention to...muscle mass” and “if albumin is within normal...<5% [weight loss] per month is encouraged.” Two respondents reported that they do not advise patients with obesity who are on dialysis to lose weight at all unless weight loss is required for kidney transplant.

Challenges of Weight Loss Management in ESKD

When asked to choose the single greatest challenge that patients with obesity who are on dialysis face when trying to achieve healthy weight loss, 28% of respondents reported “too little energy,” whereas 21% reported the inaccessibility of healthy food (Figure 3). When asked to choose the single greatest challenge that renal dietitians face in supervising weight loss in dialysis settings, 44% of respondents reported “too little time,” whereas 26% reported that they were not adequately trained in obesity management. When asked to rate their own comfort in supervising volitional weight loss among patients with obesity on dialysis (0=very uncomfortable, 100=very comfortable), the median score was 64 (IQR 46.8–75.8). Several respondents identified the gap in renal nutritional guidelines on obesity management as a key challenge (Table 3).

DISCUSSION

In this survey study of thirty-one renal dietitians, there was substantial heterogeneity in weight loss management strategies for patients with obesity who are receiving dialysis. Calorie restriction was reported as the most common weight loss strategy and dry weight changes as the most important biomarker for evaluating weight loss. The majority of

respondents reported that healthy weight loss was rare among patients with obesity on dialysis. The main challenges in obesity management were lack of time and inadequate training. In the context of the worldwide obesity epidemic, these results point to the urgent need for resources and guidance to improve obesity management in ESKD.

Individuals with ESKD and obesity who are transplant candidates or recipients may be strongly advised to lose weight, particularly to minimize complications after kidney transplantation and to decrease the risk of graft rejection.³ In a study of 134 African-American hemodialysis patients, Gupta et al. found that whereas 98% of normal weight patients perceived a need to maintain or gain weight, 70% of patients with obesity perceived a need to lose weight.⁷ However, the majority of renal dietitians in our study reported that patients with obesity on dialysis are rarely successful in their own volitional weight loss attempts. Renal dietitians reported that they are challenged by the lack of time to provide counseling and support to patients on dialysis who are trying to lose weight. With respect to patient challenges, respondents rated the lack of energy and healthy food options as the most important challenges to successful weight loss. The challenges of obesity management in dialysis settings may partially explain the nine-fold increase in the number of individuals with ESKD in the US who underwent bariatric surgery between 2006 and 2016.¹²

With respect to surrogates of weight loss, some respondents pay close attention to changes in visceral protein stores, energy, and quality-of-life as a part of obesity management. Interestingly, 40% of respondents do not assess waist circumference when they are supervising the volitional weight loss attempts of their dialysis patients. However, several studies suggest that anthropometric measures, such as waist circumference,^{5,13} and direct measures of body composition may be superior to body weight and BMI when determining health risks in ESKD.^{3,5,14,15} Accordingly, the Accreditation Council for Education in Nutrition and Dietetics (ACEND) has recently recommended an increased focus on the nutrition-focused physical exam.¹⁶ However, the lack of time reported by renal dietitians is likely a substantial barrier to implementing more granular assessments of anthropometry and body composition into their obesity management paradigms.

Several respondents in the study had substantial concerns about the potential dangers of weight loss in the setting of ESKD. Many dietitians emphasized the need to balance risks of protein-energy malnutrition with the risks of obesity. These concerns might have arisen from longstanding evidence of a survival advantage of higher body weight in ESKD (i.e., “the obesity paradox”), which is thought to reflect preserved muscle mass and nutritional status among some individuals with obesity and ESKD.^{17,18} Further, recent studies have found that substantial weight loss (i.e., a loss of greater than 5–10% body weight) in the setting of ESKD might signal a higher risk of death, independent of BMI.^{19–21} In our survey, several respondents described methods to try to disentangle reasons for weight loss, and to distinguish volitional from unintentional weight loss in dialysis patients. Unintentional weight loss is a component of the Physical Frailty Phenotype, a syndrome of vulnerability to health stressors that is highly prevalent among dialysis patients of all ages and predicts a higher risk of death.^{22,23} The heterogeneity we observed among renal dietitians with respect to their comfort and training in obesity management underscores the need for clinical

standards to support patients with obesity and ESKD in achieving volitional weight loss when it is required, without compromising overall health.

To our knowledge, this is the first study to assess renal dietitian perspectives on obesity management in dialysis settings. However, this study should be considered with respect to its limitations. The main limitations of the study are its small sample size and potential response bias. More perspectives are needed from all stakeholders, including patients, in order to have a comprehensive understanding of the barriers and solutions to improve obesity management in ESKD. The results of this pilot survey should motivate larger studies to improve obesity management in ESKD and underscore the need for nutritional guidelines for people with obesity on dialysis who desire or require weight loss.

CONCLUSION

In this survey of thirty-one renal dietitians from across the United States, we found that renal dietitians employ a variety of methods to support people with obesity and ESKD who are pursuing weight loss. Substantial barriers, including lack of time for dietitians and lack of energy for patients, may hinder healthy weight loss among this patient population. The “obesity paradox” adds further questions on the safety of weight loss in ESKD. The survey suggests that renal dietitians require more resources and guidance to support patients with obesity receiving dialysis who are attempting to lose weight without compromising their health.

PRACTICAL APPLICATIONS

The results of this survey indicate that there are several approaches currently used to supervise weight loss among individuals with obesity and end-stage kidney disease. Studies are needed to test the safety and efficacy of different weight loss strategies in this vulnerable patient population. The results also indicate that renal dietitians require additional training, guidelines, and resources to support dialysis patients with obesity in maintaining their health while also achieving desired weight loss.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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ABBREVIATIONS:

BMI	Body Mass Index
NKF	National Kidney Foundation

KDOQI	Kidney Disease Outcomes Quality Initiative
IQR	Interquartile Range
ESKD	End-Stage Kidney Disease

REFERENCES

1. World Health Organization. Global Strategy on Diet, Physical Activity and Health: What is overweight and obesity? World Health Organization. https://www.who.int/dietphysicalactivity/childhood_what/en/. Published 2019. Accessed November 11, 2019.
2. Saran R, Robinson B, Abbott KC, et al. US Renal Data System 2016 Annual Data Report: Epidemiology of Kidney Disease in the United States. *Am J Kidney Dis*. 2017;69(3S1):A7–A8. [PubMed: 28236831]
3. Lentine KL, Delos Santos R, Axelrod D, Schnitzler MA, Brennan DC, Tuttle-Newhall JE. Obesity and kidney transplant candidates: how big is too big for transplantation? *Am J Nephrol*. 2012;36(6):575–586. [PubMed: 23221167]
4. Kalantar-Zadeh K, Rhee CM, Chou J, et al. The Obesity Paradox in Kidney Disease: How to Reconcile it with Obesity Management. *Kidney Int Rep*. 2017;2(2):271–281. [PubMed: 28439569]
5. Kalantar-Zadeh K, Streja E, Kovesdy CP, et al. The obesity paradox and mortality associated with surrogates of body size and muscle mass in patients receiving hemodialysis. *Mayo Clin Proc*. 2010;85(11):991–1001. [PubMed: 21037042]
6. Johansen KL. Obesity and body composition for transplant wait-list candidacy--challenging or maintaining the BMI limits? *J Ren Nutr*. 2013;23(3):207–209. [PubMed: 23611548]
7. Gupta V, McGill RL, Samra M, et al. Weight, Weight Perception, and Self-reported Access to Transplantation in African American Hemodialysis Patients. *Kidney Med*. 2019;1(4):226–227. [PubMed: 31754661]
8. Saeed Z, Janda KM, Tucker BM, Dudley L, Cutter P, Friedman AN. Personal Attitudes Toward Weight in Overweight and Obese US Hemodialysis Patients. *J Ren Nutr*. 2017;27(5):340–345. [PubMed: 28533101]
9. Kopple JD. National kidney foundation K/DOQI clinical practice guidelines for nutrition in chronic renal failure. *Am J Kidney Dis*. 2001;37(1 Suppl 2):S66–70. [PubMed: 11158865]
10. Department of Health and Human Services CfMaMS. Conditions for Coverage for End-Stage Renal Disease Facilities; Final Rule. Federal Register. Federal Register Web site. <https://www.cms.gov/Regulations-and-Guidance/Legislation/CFCsAndCoPs/downloads/ESRDfinalrule0415.pdf>. Published 2008. Accessed November 12, 2019.
11. McCormack HM, Horne DJ, Sheather S. Clinical applications of visual analogue scales: a critical review. *Psychol Med*. 1988;18(4):1007–1019. [PubMed: 3078045]
12. Sheetz KH, Woodside KJ, Shahinian VB, Dimick JB, Montgomery JR, Waits SA. Trends in Bariatric Surgery Procedures among Patients with ESKD in the United States. *Clin J Am Soc Nephrol*. 2019;14(8):1193–1199. [PubMed: 31345840]
13. Noori N, Sharma Parpia A, Lakhani R, Janes S, Goldstein MB. Frailty and the Quality of Life in Hemodialysis Patients: The Importance of Waist Circumference. *J Ren Nutr*. 2018;28(2):101–109. [PubMed: 29158063]
14. Chumlea WC. Anthropometric and body composition assessment in dialysis patients. *Semin Dial*. 2004;17(6):466–470. [PubMed: 15660577]
15. Beberashvili I, Azar A, Abu Hamad R, et al. Abdominal obesity in normal weight versus overweight and obese hemodialysis patients: Associations with nutrition, inflammation, muscle strength, and quality of life. *Nutrition*. 2019;59:7–13. [PubMed: 30415161]
16. Academy Quality Management C Academy of Nutrition and Dietetics: Revised 2017 Scope of Practice for the Registered Dietitian Nutritionist. *J Acad Nutr Diet*. 2018;118(1):141–165. [PubMed: 29173834]

17. Kalantar-Zadeh K, Kopple JD, Kilpatrick RD, et al. Association of morbid obesity and weight change over time with cardiovascular survival in hemodialysis population. *Am J Kidney Dis.* 2005;46(3):489–500. [PubMed: 16129211]
18. Kalantar-Zadeh K, Abbott KC, Salahudeen AK, Kilpatrick RD, Horwich TB. Survival advantages of obesity in dialysis patients. *Am J Clin Nutr.* 2005;81(3):543–554. [PubMed: 15755821]
19. Chang TI, Ngo V, Streja E, et al. Association of body weight changes with mortality in incident hemodialysis patients. *Nephrol Dial Transplant.* 2017;32(9):1549–1558. [PubMed: 27789782]
20. Ku E, Kopple JD, Johansen KL, et al. Longitudinal Weight Change During CKD Progression and Its Association With Subsequent Mortality. *Am J Kidney Dis.* 2018;71(5):657–665. [PubMed: 29217305]
21. Harhay MN, Ranganna K, Boyle SM, et al. Association Between Weight Loss Before Deceased Donor Kidney Transplantation and Posttransplantation Outcomes. *Am J Kidney Dis.* 2019;74(3):361–372. [PubMed: 31126666]
22. McAdams-DeMarco MA, Law A, Salter ML, et al. Frailty as a novel predictor of mortality and hospitalization in individuals of all ages undergoing hemodialysis. *J Am Geriatr Soc.* 2013;61(6):896–901. [PubMed: 23711111]
23. McAdams-DeMarco MA, Ying H, Olorundare I, et al. Frailty and Health-Related Quality of Life in End Stage Renal Disease Patients of All Ages. *J Frailty Aging.* 2016;5(3):174–179. [PubMed: 29240319]

Figure 1.
Renal dietitian-reported prevalence of weight loss strategies among obese dialysis patients

Figure 2.
Utilization of surrogates in weight loss management of obese dialysis patients

Figure 3. Single greatest challenge of obesity management in dialysis settings for patients (Panel A) and renal dietitians (Panel B), as reported by renal dietitians.

Table 1.

Respondent characteristics

Characteristic	Proportion or Median (Interquartile Range)
Age Group	
<35 years	22.6%
35–50 years	22.6%
51+ years	54.8%
Years of Experience	6.0 (4.5–13.5)
Master's Degree or Higher	42%
Number of Dialysis Patients Cared for In Career	350 (200–850)

Table 2.

Methods to monitor the safety of weight loss in dialysis settings

Theme	Comments
Diet Recalls	<ul style="list-style-type: none"> • “I mostly gather subjective information from the patient (diet recalls, appetite report, etc.) to support numerical data (weight on the scale).” • “Diet recalls, assess current health status/appetite...” • “...very low kcal diet or high protein diet with very little CHO.”
Physical Exam	<ul style="list-style-type: none"> • “Nutrition-focused physical assessment” • “Extreme dry weight changes after hospitalization” • “...observing their physical appearance”
Lab Results	<ul style="list-style-type: none"> • “Labs such as albumin, phosphorus, Pre BUN, Hgb...” • “Albumin, BUN, and creatinine levels.”
Rate of Weight Loss	<ul style="list-style-type: none"> • “Time period of weight loss.” • “Reasonable or healthy weight loss = 4–8 lbs per month, maintained month after month”

Table 3.

Themes of renal dietitian responses on the challenges of weight loss management in dialysis settings

Theme	Comments
Gap in Renal Nutritional Guidelines	<ul style="list-style-type: none"> “Guidelines should include physical assessment of the patient” “...inclusion of weight loss guidelines for the ESRD patient would expand our assessment process and improve care.”
Lack of Training in Weight Loss Counseling	<ul style="list-style-type: none"> “... I am not proficient in weight loss counseling.”
Lack of Time	<ul style="list-style-type: none"> “...one of the biggest reasons it is a challenge to monitor and help patients with weight loss goals is lack of time...” “...[dietitians] have so many new added responsibilities including pharmacy...oral hygiene, UKM analysis...” “I’m so busy being a pharmacy tech...that I barely have time to monitor P, Ca, PTH, K, and albumin.” “...difficult to be able to find the time to provide adequate counseling...”
Lack of Resources	<ul style="list-style-type: none"> “Lower socioeconomic area-limited resources” “...[patients] lack resources and support to prepare healthful balanced meals.”