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Implementing a Culturally Sensitive Fluid and Dietary Educational Intervention in an Outpatient Dialysis Center

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Implementing a Culturally Sensitive Fluid and Dietary Educational Intervention in an Outpatient

Dialysis Center

A Capstone Project Presented

by

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Dedication

This project is dedicated to the Almighty God without Whom I would not be here. I give Him all the glory, honor and adoration.

Acknowledgments

By grace I have made it this far. But all that will not be possible without the unwavering love and support of my husband Titus who has taken up many roles so I can complete my schooling. I would like to thank my children: Victoria, Christine and Sophia-Joy for their loving support and for pardoning me for all the times I missed their games, presentations or recitals and for knowing that though I might not be physical there, my heart is always with them. I would like to acknowledge my parents – late Prof Joseph Fapohunda and Prof Sophie B. Oluwole - for their example, encouragement, and teaching me that the sky is the limit.

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Abstract

Chronic renal failure is characterized by a gradual, irreversible kidney dysfunction that often leads to end-stage renal failure. Hemodialysis (HD) is the most prevalent method of removing fluid and uremic toxins from patients with end-stage renal disease (ESRD). Successful HD treatment outcomes depend on patient adherence to treatment regimen to reduce the risks of symptoms and medical complications and to restore quality of life. However, compliance with fluid and dietary restrictions remains a problem among HD patients.

This project implemented an effective, culturally sensitive fluid and dietary educational program in an outpatient dialysis center. The sample size of 17 participants consisted of 8 males and 9 females from various racial backgrounds. The patients ranged in age from 40 to 85 years. Other demographic information collected included years on dialysis, educational backgrounds and work status.

Pre and post test results indicated increased in knowledge in all participants. There were however, no significant correlations between patients' demographic characteristics and change in test scores. Qualitative comments reflected various themes including: conflicting dietary messages for participants with multiple chronic diseases, need for family involvement and limited knowledge of culturally appropriate renal foods. These findings have implications for clinical practice including modifying generic educational interventions to reflect the culture of patients, and providing ongoing educational opportunities for nephrology nurses so they are better equipped to provide nutritional information to their patients.

Key Words: Chronic Renal Failure, hemodialysis fluid restrictions, culturally sensitive care, fluid and dietary restrictions

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Background

Chronic renal failure is an irreversible dysfunction that frequently leads to end-stage renal failure. Hemodialysis (HD) is the most common method of removing uremic toxins and fluid from patients with end stage renal disease (United States Renal Data system [USRDS], 2009). There are currently about 370,000 HD patients in the United States (Center for Disease Control and Prevention [CDC], 2013) and the yearly cost of treating a single patient on HD exceeded \$80,000 as far back as 2009 (National Kidney and Urologic Diseases Information Clearinghouse, [NKUDIC] 2012).

To reduce the accumulation of harmful toxins, electrolytes and fluids between treatments, HD patients must adhere to therapeutic regimens including fluid and dietary modifications as well as routine medication regimens (Barnett, Pinikahana, Si-Yen, & Yoong, 2008). Fluids must be restricted since the failing kidney is unable to excrete excess fluid; sodium and potassium intake is regulated since the failing kidney is unable to excrete these electrolytes (Russell et al., 2011). While studies have linked compliance with treatment regimen (including adherence to diet and fluid restrictions) to successful HD treatments (Baraz, Parvardeh, Mohammadi & Broumand, 2009; Shi et al., 2013), HD patients continue to show fluid compliance rates between 25.4% and 79.5% and diet compliance rates between 18.6% and 68.2% (Kim & Evangelista, 2010).

These findings are significant, since failure to comply with treatment regimen is associated with increased morbidity and mortality in HD patients (Baraz, Broumand, Mohammadi & Parvardeh, 2010; Kim, Evangelista, Phillips, Pavlish & Kopple, 2010). Successful treatment outcomes therefore depend on patient compliance to reduce the risks of

symptoms and medical complications and to restore quality of life. Since knowledge deficit is associated with non-adherence behavior in patients, (Barnett et al., 2008), an effective educational intervention is necessary to support HD patients and their families to accomplish the complex treatment regimen necessary for HD patients.

Patient education is also recognized and recommended by the National Kidney Disease Education Program (NKDEP, 2014) as an important aspect of providing care for HD patients. These interventions are particularly useful when there is a cultural component. Many studies have demonstrated that culturally tailored educational interventions lead to better outcomes than generic interventions that focus only on the dominant cultural group (Song et al., 2010; De Brito-Ashurst et al., 2013). While the methods of delivering such interventions have been varied, there have been consistencies in participants' satisfaction with the interventions (Song et al., 2010; Joo, 2014) and increased specific dietary knowledge (Nam, Janson, Stotts, Chelsa & Kroon, 2012). The implementation of a fluid and dietary educational intervention that is culturally relevant is valuable and can have a positive impact on HD patients who often have difficulty adhering to their fluid and dietary restrictions. To this end, the goal of this project is to implement a culturally relevant fluid and dietary educational intervention in an outpatient dialysis center.

Literature Review

A search of Cumulative Index of Nursing and Allied Health Literature (CINAHL), MEDLINE (PubMed), Cochran Review, Academic Search Complete, ProQuest education journals, Education Resources Information Center (ERIC) and Science Direct was carried out to identify studies whose goals were to examine the effect of an educational intervention on fluid,

diet or medication adherence in adult hemodialysis patients. Studies with culturally tailored nutrition education were also examined. To obtain more current interventions, the research years were limited to 2008 to 2014. Combinations of the following words were used for the various searches: hemodialysis, education, culture, culturally tailored, intervention, fluid, diet, end-stage kidney disease, end-stage renal disease, noncompliance, non-adherence, medication, phosphate and nutrition. Inclusion criteria included only searches in English, full text, testing an intervention to increase diet, fluid or medication compliance in hemodialysis patients. Data extracted included sample size and location of research, design, outcome or result of intervention, aim of the study, level of evidence and strengths and weaknesses as will be seen in the attached matrix.

Identified Studies

Baraz, Parvardeh, Mohammadi, & Broumand (2010) carried out a level I randomized control trial (John Hopkins Nursing Evidenced-Based Practice [JHNEBP]) with a sample of 63 hemodialysis (HD) patients. The aim of the research was to determine the effect(s) of educational intervention on diet and fluid compliance among HD patients. Participants were randomly assigned to one of two educational programs (oral or video) and the results of the interventions in both groups were compared. According to Baraz, Parvardeh, Mohammadi, & Broumand (2010), there is currently no generally acceptable standard for evaluating regimen compliance in HD patients, therefore, factors such as interdialytic weight gain, skipping or shortening treatments, and serum electrolytes are used to gauge nutritional adherence in these patients. Results demonstrated that both techniques (oral and video education) were effective methods of increasing fluid and dietary compliance in HD patients. However, the sample

comprised of a high percentage of individuals with at least a college education and this could have facilitated increased adherence to educational intervention in the small sample size. The goal of this project is to translate the findings of Baraz, Broumand, Mohammadi & Parvardeh (2010) into clinical practice in an outpatient dialysis setting.

Kim, Evangelista, Phillips, Pavlish & Kopple (2010) echoed Baraz et al. (2010) that actual treatment adherence rates of HD patients are difficult to obtain because there is no one generally accepted method of measurement. The result is the use of biological and biochemical markers to evaluate adherence to treatment regimens in patients with end stage renal diseases (ESRD). Kim, Evangelista, Phillips, Pavlish & Kopple (2010) claim this is problematic because although these markers may indicate inadequacies in clinical outcomes, they do not necessarily measure non-adherence. Their goal was therefore to develop a reliable and valid method of measuring treatment adherence in HD patients. The level 3 (JHNEBP) study had a sample size of 58 participants and clearly stated inclusive and exclusive criteria. Also, both the content validity and reliability of the adherence questionnaire were tested. Their findings supported their goal of developing a reliable method of measuring all the components of the adherence behavior of HD patients. However, one of the shortcomings of the research is that the questionnaire is 7 pages long and is written at a Flesch-Kincaid level of 8.7 which might makes it a difficult measuring tool for the average reader. In spite of its shortcomings however, the End –Stage Renal Disease Adherence Questionnaire provides a valuable alternative method of measuring nutritional adherence in HD patients and can be used before and after an educational intervention to determine the effect of the intervention.

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In a level two quasi-experimental study (JHNEBP) of twenty-six participants, Barnett, Yoong, Pinikahana & Si-Yen (2008) demonstrated the possibility of reducing nonadherence to HD regimen through the use of an educational intervention. The intervention utilized a one-time one-to-one teaching session of about 30 minutes, along with a ten minute weekly reinforcement over a 2- month period. The inclusion and exclusive criteria of the samples were discussed. A limitation of the research is that while it provided a list of major content areas utilized for the educational intervention, a sample or a link to the exact materials was not made available for scrutiny leaving one to wonder on the exact content of the educational program and making the intervention impossible to duplicate. However, the research findings further support a correlation between educational intervention and improved adherence level in HD patients.

Lindbergh, Lindberg & Wikstrom (2010) utilized a level three (JHNEBP) cross-sectional survey with a sample size of 133 to determine the effects of cognitive factors and depressive symptomology on fluid adherence in HD patients. The researchers found three hemodialysis patients' subgroups: low self-efficacy, distraction and depressive symptoms and high self-efficacy. That finding along with the associated differences in rates of fluid intake per group could be applied to a teaching intervention to achieve maximum effectiveness. The article discussed the inclusive and exclusive criteria used in the study. To gain a wider acceptance the cluster analytical tool used in this research needs to be replicated in different regions to validate the stability of the subgroups.

The effect of a nurse-led educational and counseling intervention on adherence to phosphate binders in HD patients was the focus of a level two quasi-experimental study (JHNEBP) by Van Camp, Huybrechts, Van Rompaey & Elseviers (2011). While all 257 study participants were

counseled biweekly on adherence to phosphate binders, only members of the intervention group were educated on adherence to phosphate binders and provided with tailored information on the same topic. The study demonstrated that there was an increase in the mean adherence level in the intervention group from 83% to 94% after 13 weeks and a decrease in the mean adherence level of the observational group from 86 % to 76% within the same time period suggesting a need for educating and reinforcing adherence behavior in HD patients. However, while the research provided a detailed description of the utilized intervention thereby increasing the reliability of the study, yet, the cost of utilizing the electronic method to assess adherence to medication as used in the study may be a barrier to further studies. Nevertheless, the study findings further support the effectiveness of an educational intervention to increase treatment adherence in HD patients.

Shi et al. (2013) with a sample size of 80 participants demonstrated the importance of a nurse-led educational intervention to reduce hyperphosphatemia in patients with ESRD. The knowledge questionnaire used in this level one randomized control study (JHNEBP) tested positive for validity and reliability. However, while biological markers were utilized to assess improvement in serum phosphorus levels, the study also partly relied on patients' self-report of medication adherence leading to a measure of subjective aspects.

The objective of a systematic review of randomized control trials by Matteson & Russell (2010) was to assess the effectiveness of various interventions designed to increase adherence to treatment regimen, fluid, diet and or medication in adult hemodialysis patients. The range of the sample size was from 69 to 139. Although relatively few studies were included in the review, six of the eight studies reviewed demonstrated statistically significant differences such as decreased

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non-adherence to interdialytic weight gain from 100% pre-intervention to 80% post interventions. According to Matteson & Russell (2010), while all the studies in the review utilized a cognitive component, studies that demonstrated the most improvements utilized cognitive or cognitive and behavioral component. This finding suggests that focusing on educational interventions in this area is likely to have a greater impact on adherence outcomes.

Many studies have been carried out to determine the impact of culture on the food choices of patients with chronic diseases. In a RCT by De Brito-Ashurst (2013), the researcher compared the effect of a culturally tailored low salt diet along with standard care compared to standard care alone. The intervention included advice to consume low-salt diet, demonstrated cooking sessions that allowed participants to cook a traditional meal followed by a demonstration of cooking the meal with about 50% less sodium and biweekly follow up phone calls. The outcome measures included Bp measurement, 24 hour urinary sodium as well as creatinine, potassium and estimated glomerular filtration rate (eGFR). The result of the 48 participants study demonstrated increased adherence to low salt intake in the intervention group as demonstrated by a reduction in urinary sodium excretion by 122mmol/24h (95% CI -140 to -105, $p < 0.001$) compared to 13mmol/24 h (95% CI -18 to -8, $p < 0.001$) in the control group and the difference at 6 months post intervention was significantly different favoring the intervention group. Although there were no significant differences between the two groups in relation to eGFR, the intervention group had significantly lower Bp compared to the control group in this study suggesting that a culturally tailored low sodium diet was effective in the management of Bangladeshi patients with HTN. The small sample size may however limit the generalizability of the research finding.

With a sample size of 25 participants, Whitt-Glover et al., (2013) conducted a feasibility study to determine the effect of implementing a culturally modified version of the DASH diet among African Americans in a community-based setting. The researchers in the randomized trial incorporated culturally sensitive materials such as examples of African American food and dietary practices, perception of African American healthy eating and the existing local food environment into the generic DASH interventional materials. The intervention included providing participants with information about budget management, meal planning, effective grocery shopping, DASH-informed methods of food preparations, and desired eating habits to produce desired outcomes. The result of the twelve-week study demonstrated increased self-efficacy in the intervention group's ability to reduce the consumption of salty and fatty foods. Dietary recall in the same group revealed a significant increase in the servings of fruits and vegetables consumed compared to the control participants. Limitations of the study included not only the small sample size, but the reliance upon self-report for outcome measurement may be problematic because self-reports are not always reliable (Buscher, Hartman, Kallen & Giordano, 2011).

Discussion

While specific educational interventions might differ, there is a general consensus in the literature that educational interventions are effective in improving adherence to fluid and dietary restrictions in individuals with ESRD (Barnett, Yoong, Pinikahana & Si-Yen, 2008; Baraz, Parvardeh, Mohammadi, & Broumand, 2010; Shi et al., 2013). Specifically, educational interventions that are culturally relevant have demonstrated increased likeliness of improving participants' knowledge (Song et al., 2010) and are effective methods of empowering

hemodialysis patients to adhere to their fluid and dietary treatment regimen. These findings are significant because although hemodialysis is life-saving for patients with ESRD and adherence to diet and fluid is paramount for successful treatment and strongly associated with better health outcomes, non-adherence to treatment regimen remain a significant problem in hemodialysis patients leading to a need to provide effective and culturally relevant educational intervention. Appendix A is a matrix of the studies synthesized in this review.

Theoretical framework

Many factors influence an individual's decision to modify habits that might impact their health. The Health Belief Model (HBM) - a middle range theory, emphasizes the active role of the patient in disease prevention or management. The HBM attempts to predict how individuals would behave under certain conditions. According to this model, an individual's health-related behavior depends on their perception in the following areas: 1) The severity of a potential illness – an individual who does not perceive that non-adherence to diet restrictions as a HD patient may lead to a severe illness is less likely to be motivated to change whereas the individual is more apt to change if they believe they are at risk of developing a specific condition. 2) The person's susceptibility to that illness - an individual's perception of their risk of developing a complication such as fluid overload as a result of non-adherence to dialysis treatment regimen would influence their health-related behavior. 3) The benefits of taking a preventive action, - a health behavior is more likely to start or continue when the individual perceives that the behavior will lead to a risk reduction. 4) The patient's perception to barriers in making behavioral changes - individuals who perceive that they are able to overcome and or manage barriers to

better health such as those relating to adhering to HD treatment regimen are more likely to change.

The goal of this project is to implement a fluid and dietary educational intervention in an outpatient dialysis center. The HBM is applicable to the project and has been successfully applied to educational interventions in HD patient (Baraz, Broumand, Mohammadi, Parvardeh, 2010). Knowledge deficit is associated with non-adherence in patients (Barnett et al, 2008), therefore an effective educational intervention is necessary to support HD patients and their families to accomplish the complex treatment regimen.

Project Setting Description

The setting is an outpatient dialysis unit in an urban community in Rhode Island. With a median income of \$51, 470 versus the nation's \$53, 470, the majority (87%) of the residents are White (US Census Bureau, 2014). Other races represented in the town are: Black or African American 4.8%, Asian 2.3%, American Indian and Alaska Native, 0. 3%, (US Census Bureau, 2014). The top major industries are education and social services 21.9%, retail 13.3% and manufacturing 3.2% and at least 80% of the population have a high school diploma or its equivalent (US Census Bureau, 2010). The project site is comparatively small catering to the needs of approximately 60 hemodialysis patients. The patient population consists of individuals above the age of 18 from various ethnic/racial groups and educational backgrounds.

Sample

The sample initially consisted of a convenient sample of 18 participants. One participant was unable to participate in the study due to hospitalization. The inclusion criteria included age above

18 years, the ability to speak and read English, the absence of obvious cognitive impairment and to be well enough to participate in the program based on the recommendation of the unit clinical coordinator. The exclusion criteria included residence in a nursing home or incarceration, as these patients may have less control over their food choices.

Design and Methods

This research translation project implemented an evidenced-based fluid and dietary educational intervention program in an outpatient HD unit. In certain studies such as Baraz, Parvardeh, Mohammadi & Broumand (2010) the interventions were carried out in hospital settings and participants attended meetings on days they did not have dialysis. However, in an outpatient setting, the patients already attend dialysis treatments three times a week, requesting increased number of visits for educational purposes could create problems for certain patients such as those who depend on state-funded transportation systems. As a result of this, the educational intervention was provided while patients were receiving dialysis treatments.

Data Collection

Demographic information was obtained from participants at the time of sign up (Appendix C). An assessment of patients' prior knowledge in relation to HD fluid and diet restrictions was obtained using a pretest questionnaire (Appendix C) before initiating the intervention. The questionnaire consisted of 26 questions related to fluid and dietary monitoring, complications of ESRD and cultural relevancy in HD educational intervention. The questionnaire - with a Flesch Kincaid reading level of 5.5, was specifically developed for this project following consultation with nephrology nurses, two registered renal dietitians and a nephrologist. To

determine change in knowledge after the educational intervention, a posttest was conducted using the same questions as in the pretest.

Materials

The materials used for the intervention consisted of PowerPoint presentations, visual aids such as empty 8 ounce cups, canned green beans, and empty boxes of food items. PowerPoint presentations depicted pictures of foods from different cultures. Each patient was provided with a take-home folder. The contents of the folders were: a notebook, a pen and some literature on fluid and dietary monitoring (see appendix D). Take-home literature provided was available in English or Spanish based on patients' preference. The educational materials were obtained from the National Kidney Disease Education Program (NKDEP), DaVita Healthcare Partners and the CDC. Participants were also provided with individual hand-held magnifiers.

Educational Intervention

Using two PowerPoint presentations, a one-to-one educational intervention was conducted while patients were receiving their HD treatment. There were a total of three educational sessions and each session lasted approximately 30 minutes. The information contained in the educational intervention included the following:

- 1). Functions of the kidney, risks, prevalence and severity of complications of CKD.
- 2). Benefits associated with taking actions to prevent or delay such complications.
- 3). Identification of restricted HD fluids and foods.
- 4). Importance of fluid and diet control

- 5). Strategies to control fluid intake
- 6). Strategies to assist in adhering to dietary restrictions in HD patients
- 7). Appropriate interdialytic weight gain.

Statistical Analysis

The Statistical Package for the Social Science ([SPSS] version 23) was utilized to analyze data. Descriptive demographic information was obtained. Test of normality was conducted followed by a paired difference test to ensure that pre and posttest scores followed a normal distribution and determine whether there was a significant difference between pre and posttest scores. A level of significance of 0.05 was used in the analysis. A correlation between change in test scores and demographic characteristics were explored.

Results

Participant Demographics

A total of 17 patients completed the study. The following is a summary of participants' demographic information in relation to race/ethnicity, education, marital status, gender, number of years on dialysis, work status, and age. In terms of the race/ethnicity of the patients, 6 (35.29%) were White, 5 (29.41%) were African American, 3 (17.65%) were American Indian or Alaska Native, and 3 (17.65%) were Hispanic or Latino. For education level, almost half or 8 (47.05%) of the 17 patients have a high school diploma or equivalent, and only 4 (23.52%) had attended college. Half or 7 (41.18%) of the 17 patients were single, 4 (23.53%) were married, 3 (17.64%) were widowed, 2 (11.76%) were divorced, and 1 (5.88%) was separated. Nine

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(52.94%) of the patients were female and 8 (47.06%) were male. For the number of years on dialysis, 13 out of the 17 patients (76.47%) were on dialysis for 1 to 5 years. Fourteen of the 17 patients (82.35%) were unemployed and 2 (11.76%) were retired. The mean age of the 17 patients was 60.47 years (SD = 12.07): the oldest age was 85 years old and the youngest age was 40 years old. The demographic data are summarized in Tables 1 and 2.

Table 1.

Frequency and Percentage Summaries of Demographic Characteristics (n = 17)

	N	%
RACE/ETHNICITY		
White	6	35.29
American Indian or Alaska Native	3	17.65
Hispanic or Latino	3	17.65
African American	5	29.41
EDUCATION		
Less than high school	1	5.88
Attended high school	2	11.76
High School diploma or equivalent	8	47.05
Attended college	4	23.52
Undergraduate degree	1	5.88
Graduate degree	1	5.88
MARITAL STATUS		
Married	4	23.53

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Single	7	41.18
Widowed	3	17.64
Divorced	2	11.76
Separated	1	5.88
GENDER		
Female	9	52.94
Male	8	47.06
# OF YEARS ON DIALYSIS		
1 to 5 years	13	76.47
6 to 10 years	4	23.53
WORK STATUS		
Unemployed	14	82.35
Retired	2	11.76
Missing	1	5.88

Table 2.

Descriptive Statistics of Principal's Age

	N	Minimum	Maximum	Mean	Std. Deviation
AGE	17	40.0	85.0	60.47	12.07

Influence of Educational Intervention on Patients' Knowledge

The Kolmogorov-Smirnov test for normality was conducted to test whether the pre and post-test scores on the Fluid and Dietary Questionnaire are normally distributed. The Kolmogorov-Smirnov statistics show that the pre-test score (KS (17) = 0.12, p = 0.20) was normally distributed, but the post-test score (KS (17) = 0.24, p = 0.01) was not normally distributed. Since one of the variables included in the paired difference test is not normally distributed, the Wilcoxon signed ranks test was conducted. A level of significance of 0.05 was used in the testing. The results of the test statistics for the Wilcoxon ranks test showed that there was a significant difference between the pre-test and the posttest scores ($Z = -3.63$; $p < 0.001$) to measure the knowledge of fluid and dietary restriction before and after the investigation.

Qualitative Data

Learning Experience

Participants stated the importance of providing educational intervention for hemodialysis patients. Almost all patients made comments in regards to this such as:

“I think this program is a learning experience and I have learned a lot...” (54 year old Hispanic/Latino female)

‘Very informative and receiving information was very helpful (69 year old White female)

“I thought it has showed me things that I wasn’t aware of ... (50 year old Black/African American female)

‘The most I learned was about phosphorus. I already know the stuff about sodium because of my diabetes’ (55 year old White male).

Risk Perception

The importance of sharing the risks associated with nonadherence to treatment regimen including increased risk of hyperphosphatemia and increased risk of hospitalization was reported as an important aspect of the educational intervention. Participants stated that they appreciated the teaching because it was a good way of

'.... reminding us about the good and bad foods; the liquids: the seriousness of our health condition: the result of not following the guidelines' (61 year old Hispanic/Latino female)

'Getting information to dialysis patient so that they have more understanding about how dialysis helps you. What foods are dangerous for you is helpful' (56 year old White female)

Visual Learners

Participants expressed appreciation for the use of pictures in PowerPoint presentations (e.g. to show food items from various cultures such as plantain and yucca), the use of teaching tools such as canned goods (to teach about sodium), empty 8 ounce cups (to teach about fluid restriction), the use of hand-held magnifying glasses and empty boxes of food item (as they practiced reading food labels including the order of food ingredients). Some comments made by participants in support of this mode of learning include

'.....when I saw the picture of the hands, the heart and what can happen if I don't do the right thing, I got it. I like to see visual and boy did I see it, the skin picture was something else' (40 year old Black male).

Another participant commented that learning was easy

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'By showing more visual effects of eating and drinking wrong foods' (41 year old Black/African American male)

Limited Understanding of Culturally Appropriate Renal Foods

Many examples of foods from different cultures were utilized during the program.

Participants' comments in relation to this feature of the program included the following:

'I can't have yucca? I eat it every day, but I boil it, is that ok?' (50 year old Spanish/Latino male)

'I love plantain, nobody ever told me I can't have that' (54 year old Hispanic/Latino female)

'I eat that' (taking about yucca), 'I got to tell you, I used to work with all Spanish people when I worked and they taught me how to eat that, I love it' (74 year old White female)

'So basically all the food from my culture I need to watch out for. I'm Italian and we eat all that stuff. Everything we eat has cheese in it: chicken perm, lasagna, the pastas- everything' (55 year old White male)

Conflicting Messages

Four participants who were diabetics expressed their frustration with trying to adhere to both diabetic and renal diets. According to one them it is hard,

'I need help with choosing healthy snacks when blood sugar is low, common recommendations are peanut butter and cheese crackers. These are both on the need to be avoided list. Blood sugar tablets do not work alone. Protein is recommended to keep

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blood sugar stable. Need help with snack that has protein and is readily available for emergency low blood sugar' (56 year old White female)

Another participant expressed her conflict this way:

'So what bread can I eat? I can't eat white bread because I am diabetic and you say wheat is high in phosphorus' (78 year old, Black/African American)

A third participant expressed herself thus:

'I thought chayote was good for your blood pressure, I didn't know dialysis patients shouldn't have that' (54 year old, Hispanic/Latino female)

Family Involvement

Two participants also discussed the need to provide educational intervention that involves family members and/or how to adhere to renal-friendly diet when with family members. In both cases they cited lack of knowledge by family members to the renal diet as hindrances to adhering to their renal diet. According to one of the participants,

'My family know that I am sick but they don't know what I can eat and not eat, I need help with what to eat at family parties when choices may not be good' (54 year old White female).

Another stated that one way to improve the program is by

'Motivation, talk to family members and get them involved' (61 year old Hispanic female)

Discussion

The outcome of this educational intervention suggests that there is some measure of knowledge deficit in HD patients in relation to their fluid and dietary recommendations. While test scores and anecdotal reports demonstrated a general lack of knowledge in these patients, the situation seem more severe in patients with multiple co-morbidities such as those with diabetes and ESRD as alluded to by participants in this program who discussed their frustration with trying to adhere to two dietary regimens that are not always complementary. This finding suggests that unless nutritional information is patient-focused, and coordinated, multiple healthcare providers may provide the same patient with contradictory messages leading to confusion and lack of adherence to these recommendations.

In this program, knowledge deficit also seemed to be magnified in patients whose cultural backgrounds are not in the majority. Culture is learned and shared and cultural backgrounds affect dietary choices (De Brito-Ashurst, 2011). Described as the lens through which one sees the world, culture affects healthcare choices since it influences decision-making (Giger et al., 2007). This program utilized many examples of culturally relevant types of food while educating patients about dietary recommendations for HD patients. To achieve quality healthcare outcomes, it is imperative that providers are aware of the cultural backgrounds of their patients because recommendations that are incongruent with the patient's health beliefs including their dietary practices and their overall perspective of the treatment plan are less likely to be adhered to (Giger et al, 2007). Providers who are astute in relation to the cultural values, beliefs, and practices of their patients are more likely to be successful in partnering with these patients to provide culturally appropriate care (Purnell, 2012) and obtain optimal health outcomes.

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Since 100% of study participants had increased test scores post intervention, this research translation suggests that a culturally sensitive educational intervention is effective in increasing the knowledge of HD patients in an outpatient dialysis center. One reason for the statistically significant difference in pre and post test scores in this program might be that adult learners are more engaged in learning what they consider important, useable and from which they expect improved performance due to increase in knowledge (Knowles, Holton, & Swanson (1998). This concept is supported by the majority of patients answering ‘Yes’ to questions # 18 and # 19 which asked them if they needed help understanding their fluid and dietary management as HD patients. Also, according to the HBM, participants’ perception of their potential to develop a complication (such as vascular calcification in ESRD patients as discussed in the intervention) and their perception of their susceptibility to such complications along with their perception of the benefits associated with actions they might take to prevent or at least reduce such risks might explain the success of the program. While the effectiveness of this program may not be generalizable, it opens a discussion on the potential of tailoring educational interventions to the cultural needs of HD patients.

Providing a one-to-one educational intervention – though time-consuming might also have provided opportunities for participants to ask questions for clarification and discuss their frustrations freely without undue pressure from other listeners. Also, the program incorporated different methods of learning: auditory, visual and tactile and the use of methods involving a variety of senses is suggested as a method of facilitate learning (Edelma, Kudza & Mandle, 2014).

In this culturally sensitive educational program, there was no statistically significant correlation between change in knowledge and socio-demographic factors such as age or gender.

However, this is in contrast to studies such as Jafari, Mobasheri & Mirzaeian (2014) and Baraz, Parvardeh, Mohammadi & Broumand (2010) that reported correlations between demographic characteristics and educational intervention in HD patients.

The importance of not stereotyping patients based on their self-proclaimed race was reinforced by the findings of this project. For example, it was noteworthy that the 78 year old White female stated that she eats yucca- a food item generally associated with people of Africa, Asia, Latin America, and Caribbean decent. This finding suggests that while it is important to be familiar with different cultures and how their beliefs might influence their health decisions, generalizations based on cultural background might lead to stereotyping and inappropriate assumptions (Saha, Beach,& Cooper, 2008) - and this might jeopardize providing quality healthcare. Cultural awareness of a patient's background is necessary but not sufficient in providing quality healthcare. Providing quality healthcare leading to optimal patient outcome would involve not only cultural competency but also the ability to provide patient-focused care.

Limitations

Patient status during treatment (tiredness, cramps, sleep etc.) may have interfered with patient assimilation of educational intervention and or test scores. However, every effort was made to avoid teaching or testing patients when any of the above were occurring. Patients may have sought and obtained information on topics covered from other sources leading to higher posttest scores. Distractions such as alarming machines while program was being implemented could have influenced learning. In some cases, the test had to be read to the participants due to factors such as visual problems or inability to write with arm with dialysis access. This could have resulted in variability in test scores.

This program did not utilize the services of healthcare workers that spoke participants' languages, yet the ability to communicate with study participants in participants' native tongue has been associated with increased participants' satisfaction in culturally tailored interventions (Joo, 2014). The intervention was carried out within a week period. It would be interesting to see the outcome of implementing the program over a longer period of time and testing patients' knowledge months after the educational intervention ended.

Implications for Practice

To reduce the risks associated with ESRD, patients on dialysis typically have to adhere to strict fluid and dietary recommendations, follow their medication regimen and attend dialysis treatments for 3 to 4 hours per treatment, 3 times per week. This regimen may be challenging not only to hemodialysis patients but to their caregivers/family members. Also since family members are not only involved in cooking but provide the setting for care, educational interventions that involve family members have the potential to yield positive health outcomes.

Nonadherence to treatment regimen may be due to lack of knowledge thereby justifying the need to educate the patients. However unless the fluid and dietary education provided incorporates cultural and ethnic food types, these interventions may be ineffective as the patients do not think that the suggestions to avoid certain foods are applicable to them since they do not consume the foods they are encouraged to avoid.

Renal dietitians are very knowledgeable about the relationship between fluid and dietary adherence and its impact on positive health outcomes for dialysis patients. However, the ratio of registered dietitians to patients is higher in outpatient dialysis centers compared to nephrology

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nurses and their patients, more frequent nursing contact provides opportunity for educational intervention therefore there is a need for nephrology nurses to be well versed (educated) in providing this type information to their patients. Lowering the ratio of renal dietitians to HD patients could also provide increased opportunities for the dietitians to provide culturally sensitive educational interventions to their patients.

Conclusion

In conclusion, although adherence to fluid and dietary restriction is a major problem with hemodialysis (HD) patients, evidence continue to show that educational interventions are effective in assisting these patients to adhere to their fluid and dietary treatment regimen. The implementation of a fluid and dietary educational intervention that is culturally relevant and involves family members is valuable and can have a positive impact on HD patients who often have difficulty adhering to their fluid and dietary restrictions.

Appendix A

Citation	Sample and location research/study was performed	Design	Outcomes/Results of the intervention and/or objectives of the study	Strength(s) and weakness(es)	<u>Evidence Level Class</u>
<p>Baraz, S., Parvardeh, S., Mohammadi, E., & Broumand, B. (2009). Dietary and fluid compliance: an educational intervention for patients having haemodialysis. <i>Journal Of Advanced Nursing</i>, 66(1), 60-68. doi:10.1111/j.1365-2648.2009.05142.x</p>	<p>N= 63 Setting: 3 general hospitals in Tehran, Iran</p>	<p>Randomized control trial</p>	<p>The aim of the study was to determine the effect of an educational intervention on fluid and diet compliance among hemodialysis patients. the compliance rate increased after both oral and video teaching in both groups of patient, there was no statistically significant difference between the two educational interventions Results: Statistically significant increase in fluid and dietary compliance after both oral and video interventions</p>	<p>Strengths: -RCT -Increased in fluid and dietary compliance after intervention Weaknesses: - lack of details of intervention -Small sample size -More than half of the participants had some college education (may affect result) -No theoretical basis -Study did not focus on noncompliant patients alone</p>	<p>Strength of evidence: Level 1 Quality rating: (good) quality (JHNEBP)</p>
<p>Kim, Y., Evangelista, L. S., Phillips, L.</p>	<p>N = 58 Setting: 8 outpatient</p>	<p>Quasi-experimental</p>	<p>The goal of the study was to develop a</p>	<p>1. Clearly stated inclusive and exclusive criteria.</p>	<p>Level 3 (JHNEBP) study</p>

<p>R., Pavlish, C., & Kopple, J. D. (2010). The End-Stage Renal Disease Adherence Questionnaire (ESRD-AQ): Testing The Psychometric Properties in Patients Receiving In-Center Hemodialysis. <i>Nephrology Nursing Journal</i>, 37(4), 377-393.</p>	<p>dialysis centers in Los Angeles, CA</p>		<p>reliable and valid method of measuring treatment adherence in HD patients.</p>	<p>2. Content validity and reliability of the adherence questionnaire were tested. 3. Findings supported their goal of developing a reliable method of measuring all the components of the adherence behavior of HD patients Weaknesses 1.Length of questionnaire is too long (17 pages) 2.Flessch-kincaid level of 8.7 3. Use of self-report in questionnaire</p>	
<p>Shi, Yue-Xian, Xiao-Yan Fan, Hui-Juan Han, Qiu-Xia Wu, Hong-Jun Di, Ya-Hong Hou, and Yue Zhao. (2013). "Effectiveness of a nurse-led intensive educational programme on chronic kidney failure patients with hyperphosphatemia:</p>	<p>N = 80 (experimental group = 40, control group = 40) Setting: 2 hospitals in Tianjin, China</p>	<p>RCT</p>	<p>Goal: To evaluate the effects of nurse-led educational intervention on the management of hyperphosphatemia and determine knowledge of phosphate among patients with ESRD</p>	<p>Strengths: 1. RTC, 2.Determined that nurse-led program plays an important role in control of hyperphosphatemia in ESRD patients Weaknesses: long-term of intervention unknown Patients might have prior knowledge about subject before</p>	<p>Strength of evidence: Level 1 Quality rating: B (good) quality (JHNEBP)</p>

randomized controlled trial". Journal of Clinical Nursing. 22 (7/8).				educational intervention	
Barnett, T., Yoong, T., Pinikahana, J., & Si-Yen, T. (2008). Fluid compliance among patients having haemodialysis: can an educational programme make a difference? Journal Of Advanced Nursing, 61(3), 300-306. doi:10.1111/j.1365-2648.2007.04528.x	N= 26 Setting: Teaching hospital in Malaysia	Quasi-experimental	The aim: of the research was to examine the effectiveness of an educational intervention on fluid compliance in hemodialysis patients Results: statistically significant reduction in mean interdialytic weight gain	Strengths: -Focused only on non-compliant patients -Statistically significant increase in adherence level Weaknesses: - Small sample size -Absence of a control group for comparison -No theoretical basis	Strength of evidence: Level 2 Quality rating: B (good) quality (JHNEBP)
Van Camp, Y., Huybrechts, S., Van Rompaey, B., & Elseviers, M. (2012). Nurse-led education and counselling to enhance adherence to phosphate binders. Journal Of Clinical Nursing,	There were 41 participants in the intervention group and 216 participants in the observational group. The study was carried out in Belgium and Dutch	The design was interventional.	Aim: The aim of the study was to examine the effect of a nurse-led education and counselling intervention on adherence to phosphate binders in hemodialysis patients. Results: There was an increase in the	Strengths: - Detailed description of intervention - multiple methods of teaching (written and oral) presented to patients - Personalized counselling to patients - Triangulation of adherence	Level 2, Quality rating B (good) quality (JHNEBP)

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<p>21(9/10), 1304-1313. doi:10.1111/j.1365-2702.2011.03967.x</p>	<p>dialysis centers.</p>		<p>mean adherence level in the intervention group from 83% to 94 % after 13 weeks and a decrease in the mean adherence level of the observational group from 86% to 76% within the same time period. Mean medication knowledge improved in the intervention group.</p>	<p>measures were utilized Weaknesses: - Not a randomized control trial -The electronic system used assumes medication is taken when pill box is open - The cost of the electronic method to assess adherence to medication can be a barrier to further studies</p>	
<p>Lindbergh, Lindberg & Wikstrom (2010). Subgroups of hemodialysis patients in relation to fluid intake restrictions: a cluster analytical approach. <i>Journal of Clinical Nursing</i> 19, 2997-3005.</p>	<p>N = 133</p>	<p>Cross-sectional survey</p>	<p>Goal: to determine the effects of cognitive factors and depressive symptomology on fluid adherence in HD patients</p>	<p>Strengths: 1. Demonstrated 3 subgroups of HD patients - low self-efficacy, distraction and depressive symptoms and high self-efficacy 2. discussed the inclusive and exclusive criteria Weakness: Pt self-report is subjective</p>	<p>level 3 (JHNEBP)</p>
<p>Matteson, M.L & Russell, C (2010).</p>	<p>8 reviews consisting of sample</p>	<p>Review of RCTs</p>	<p>Goal: systematic review RCT</p>	<p>Strengths: 1.RCTs</p>	<p>Strength of evidence: Level 1</p>

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<p>Interventions to improve hemodialysis adherence; a systematic review of randomized-controlled trials. Hemodialysis International, 14(4), 370-382</p>	<p>sizes between 69 and 139 Setting; varied</p>		<p>interventions designed to increase treatment, medication, fluid and diet adherence in adult HD patients</p>	<p>2. demonstrated the most improvement utilized cognitive or cognitive and behavioral component to adherence after the interventions 3. Established guidelines used to define outcomes Weakness 1. Small sample 2. Findings not generalizable 3. Studies lacking theoretical basis</p>	<p>Quality rating: (good) quality (JHNEBP)</p>
<p>Whitt-Glover, Hunter, Foy, Quandt, Vitolins Leng, ... & Bertoni (2013)</p>	<p>N = 152 Setting: USA</p>	<p>RCT</p>	<p>Goal: Determine the effect of implementing a culturally modified version of the Dietary Approaches to Stop Hypertension (DASH) diet among African American community-based setting</p>	<p>Strengths: RCT, Clear inclusive and exclusive criteria Limitation: small sample size, only hypertensive urban dwellers included in study, reliance on self report</p>	<p>Strength of evidence: Level 1 (JHNEBP) Quality rating: (good) (JHNEBP)</p>
<p>De Brito-Ashurst et al., (2013)</p>	<p>N= 48 Setting: East London, UK</p>	<p>RCT</p>	<p>Goal: Assess the effect of standard care and a tailored intervention versus standard care alone in salt and Bp reduction in Bangladeshi</p>	<p>Strength: Inclusion and exclusion criteria provided, findings may be generalizable to other cultures with high salt intake Limitations;</p>	<p>Strength of evidence: Level 1 (JHNEBP) Quality rating: (good) (JHNEBP)</p>

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			patients with CKD.	only single 24 h urine collections and 24 h ambulatory BP recordings were made.	
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Appendix B

Demographic Questionnaire

1. Age: _____
2. Gender
 - a) Female
 - b) Male
3. Marital status
 - a) Single
 - b) Married
 - c) Divorced
 - d) Widowed
4. Race/ethnicity
 - a) American Indian or Alaska Native
 - b) Asian
 - c) Black or African American
 - d) Hispanic or Latino
 - e) Native Hawaiian or Other Pacific Islander
 - f) White
5. Education
 - a) Less than high school
 - b) Attended high school
 - c) High school diploma or equivalent
 - d) Attended college
 - e) Undergraduate degree
 - f) Graduate degree
6. Number of years on dialysis
 - a) 1 to 5 years
 - b) 6 to 10 years
 - c) 11 to 5 years
 - d) More than 15 years
7. Work status
 - a) Employed
 - b) Unemployed

Fluid and Dietary Questionnaire

1. Which of the following foods are high in potassium?
 - a) Banana
 - b) Egg white
 - c) White bread
 - d) Not sure
2. Which of the following vegetables are high in salt?
 - a) Fresh vegetables
 - b) Canned vegetables
 - c) Frozen vegetables
 - d) Not sure
3. Which of these foods is low in salt?
 - a) Pretzels
 - b) Chips
 - c) Air-popped popcorn
 - d) Not sure
4. Which of these fruits are high in potassium?
 - a) Apples, pineapple
 - b) Grapes, peaches
 - c) Oranges, cantaloupe
 - d) Not sure
5. Drinking too much fluid can lead to
 - a) Difficulty breathing
 - b) Swelling of hands, feet and face
 - c) Increased blood pressure
 - d) All of the above
 - e) Not sure
6. The person most responsible for my health on dialysis is
 - a) The nurse
 - b) The doctor
 - c) Myself
 - d) Not sure
7. Which of the following foods are better for dialysis patients?
 - a) White bread, pasta, bagel
 - b) Dried beans, pita, oatmeal
 - c) Milk, cheese, yogurt
 - d) Not sure
8. Salt is sometimes called
 - a) Potassium

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- b) Sodium
 - c) Phosphorus
 - d) Not sure
9. The target phosphorus level for dialysis patients is
- a) 2.5 to 4.5
 - b) 3.0 to 5.5
 - c) 4.5 to 6.5
 - d) Not sure
10. I know the effect of too much phosphorus in the blood
- a) Yes
 - b) No
11. I know my 'dry weight' or estimated dry weight
- a) Yes
 - b) No
12. I know my phosphorus level
- a) Yes
 - b) No
13. Dialysis help remove fluid and waste from the body and replaces all kidney functions
- a) Yes
 - b) No
 - c) Not sure
14. When reading food labels, I know that ingredients are listed in
- a) Any order, it depends on the company
 - b) Order of weight from high to low
 - c) Order of calories from low to high
 - d) Not sure
15. All the following count as fluid: Watermelon, wine, beer, ice cream
- a) Yes
 - b) No
 - c) Not sure
16. Dairy products like milk and cheese need to be controlled by dialysis patients because they are high in
- a) Sodium
 - b) Potassium
 - c) Phosphorus
 - d) I don't know
17. I To control my fluid intake, I know that I can
- a) Drink from smaller cups
 - b) Suck on frozen grapes

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- c) Both a) and b) are correct
 - d) Not sure
18. I need help understanding how to control my fluids
- a) Yes
 - b) No
 - c) Not sure
19. I need help understanding my dialysis diet
- a) Yes
 - b) No
 - c) Not sure
20. Which cooking method is most effective for removing potassium from potatoes
- a) Peel and cut potatoes then soak in water for 12 hours before baking
 - b) Bake or fry frozen or fresh potatoes
 - c) Peel and slice potatoes then drain water after boiling
 - d) Not sure
21. Which of the following is the highest source of salt
- a) Natural salt in food
 - b) Processed foods
 - c) Cooking process
 - d) Not sure
22. People with kidney disease can use any type of salt substitute
- a) True because they are all the same
 - b) True because they are low in sodium
 - c) False because they are high in sodium
 - d) False because they may be high in potassium
 - e) Not sure
23. One way to manage your fluid and diet is to write everything you eat and drink down in a food diary and discuss it with the dietitian
- a) Yes
 - b) No
 - c) Not sure
24. As a dialysis patient reading food labels, I know what to look for
- a) Yes
 - b) No
 - c) Not sure
25. I have been taught how to make good food choices from foods eaten in my culture
- a) Yes
 - b) No
 - c) Not sure

26. How can this program be improved?

Appendix D

Take-home Brochure

Fluid and Dietary Monitoring in Hemodialysis Patients



2. How to read food labels

<http://nkdep.nih.gov/resources/nutrition-food-label-508.pdf>

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(Spanish version) <http://nkdep.nih.gov/resources/leer-etiqueta-alimentos.shtml>

3. Phosphorous <http://nkdep.nih.gov/resources/nutrition-phosphorus-508.pdf>

(Spanish version) <http://nkdep.nih.gov/resources/dieta-sodio-rinones-508.pdf>

4. Sodium <http://nkdep.nih.gov/resources/nutrition-sodium-508.pdf>

(Spanish version) <http://nkdep.nih.gov/resources/dieta-sodio-rinones-508.pdf>

5. Sodium (Sodium role in processed food)

http://www.cdc.gov/salt/pdfs/Sodium_Role_Processed.pdf

6. Potassium <http://nkdep.nih.gov/resources/dieta-sodio-rinones-508.pdf>

(Spanish version) <http://nkdep.nih.gov/resources/dieta-potasio-rinones-508.pdf>

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