

## Impact of Knowledge, Attitude and Behavior among Maintenance Hemodialysis Patients for Adherence to Dietary Regimen – A Single Centre Experience

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### Abstract

*Chronic Kidney Disease is a global public health problem. Malnutrition is common among dialysis population with serious consequences to quality of life and also leading to mortality. There is inadequate data regarding the effect of nutritional intervention on knowledge, attitude and behavioral patterns of patients with respect to adherence to renal dietary regimen. The present study is a pilot study in Indian hemodialysis population to ascertain the knowledge of renal dietary regimen impacting their attitude and behavioral aspects at our tertiary care center. We found that knowledge, attitude and behavior of diet and fluid adherence are independent variables. There is no correlation between knowledge, attitude and practice of renal dietary recommendations among maintenance hemodialysis population at our tertiary care centre. There was poor adherence to potassium and fluid restriction. Perhaps consistent monitoring and repeated nutritional intervention in these group of patients might improve the behavioral pattern with regards to renal dietary regimen.*

**Keywords:** Hemodialysis patients, Renal dietary regimen, Knowledge, Attitude, Behavior, Adherence

### 1. Introduction

#### 1.1 Background

Chronic Kidney Disease (CKD) is a major health problem globally. In India an alarming number of about 8 million people are suffering from this disease. Patients undergoing hemodialysis have a high prevalence of Protein Energy Malnutrition (PEM) and inflammation [Rao P. et. al (2008)<sup>1</sup>]. PEM and wasting are strong predictors of death among hemodialysis patients [Fouque D. et. al (2007)<sup>2</sup>]. There is a paucity of data regarding the prevalence and clinical consequences of PEM in the chronic renal failure. However in patients on maintenance dialysis and renal transplant patients in developing countries, malnutrition is reported to be present in 42% - 77%. PEM is strongly associated with morbidity and mortality [Abraham G. et. al (2003)<sup>3</sup>]. All hemodialysis patients should receive a care plan and individualized dietary information in writing [Fouque D. et. al (2007)<sup>2</sup>]. There are numerous causes for malnutrition and decreased nutrient intake is the most important [KDOQI Guidelines (2000)<sup>4</sup>]. In a developing country like India where there is lack of financial, transport and logistic support there is a barrier among hemodialysis patients for opting thrice weekly dialysis regimen leading to poor nutritional status.

The decreased nutrient intake could be due to:-

- (i) Overzealous dietary restrictions.
- (ii) Delayed gastric emptying and diarrhea.
- (iii) Intercurrent illness and hospitalizations.
- (iv) Decrease in food intake on hemodialysis days.
- (v) Medications causing dyspepsia.
- (vi) Inadequate dialysis.
- (vii) Monetary constraints
- (viii) Depression.
- (ix) Altered sense of taste
- (x) Other medical comorbidities like associated liver disease, cardiac failure, malignancy. [Daugirdas J.T. et. al (2009)<sup>5</sup>].

Anorexia is a common cause of PEM in hemodialysis patients which leads to drastic weight loss which in turn has devastating consequences on quality of life, morbidity and mortality. Nutrition intervention for patients with Chronic Kidney Disease includes modifications in sodium, fluid, potassium, calcium and Vitamin D, iron, calorie and protein intake. Although global recommendation are available, nutrition care must be individualized based on serum chemistry levels, fluid balance and nutritional status [Schlenker E. D. et. al (2011)<sup>6</sup>]. Patients on hemodialysis are prescribed to adhere to a very difficult treatment regimen consisting of fluid and dietary restriction, many daily medications and usually 4 hour hemodialysis session twice or thrice per week. Rush H. et. al (1998)<sup>7</sup> conducted a study on 35 hemodialysis patients in Children's Hospital, Ireland to evaluate various aspects of patient adherence with a view to identify attitudes and behaviors that contribute to or detract from adequate adherence to treatment regimen.

*The present study is a pilot study in Indian hemodialysis population to ascertain the knowledge of renal dietary regimen impacting their attitude and behavioral aspects among hemodialysis patient group at our tertiary care center.*

## 1.2 Definitions

**Knowledge:** to assess the awareness of renal dietary regimen provided during regular counseling sessions.

**Attitude:** to ascertain the degree of consideration and acceptance of dietary regimen pertaining to diet and fluid limitations.

**Behavior:** to assess the conduct of renal diet requirements.

## 2. Materials and Methods

### 2.1 Selection of patients

1. CKD stage V patients on regular maintenance hemodialysis (MHD) regimen of either gender with age between 18 – 65 years formed the study population.
2. Those who had undergone  $\geq 3$  months of hemodialysis with permanent dialysis access – AV fistula/AV graft.
3. Clinically stable patients – with no severe cardiac and liver failure.
4. Those with retroviral positive were excluded.
5. Those with active infection like Tuberculosis and malignancy were excluded.

Patients who were regularly undergoing dialysis (8 – 12 hours per week) at St. John's Medical College Hospital, a 1200 bedded tertiary care centre were selected for the study. A cross sectional study was conducted on 50 maintenance hemodialysis patients. Patients who gave voluntary consent to participate in the study were enrolled. Institution Ethics Committee approval was obtained for the conduct of the study.

### 2.2 Study Design

The study concentrated on adherence to renal dietary regimen – Knowledge, Attitude and Behavior components were assessed. An one to one interview schedule method was employed to obtain information on Knowledge, Attitude and Behavior over past 4 weeks at the time of interview. Appetite and factors affecting food intake were also procured which might influence the patients' dietary intake. Patients' demographics, biochemical and haematological parameters, treatment modality and previous history of medical condition were obtained by chart reviews.

The laboratory investigations estimated were Haemoglobin, Serum albumin, Serum electrolytes – sodium, potassium, calcium and phosphorus levels which was the average of 3 consecutive months. Interdialytic weight gain for a week was considered to evaluate fluid adherence. The questionnaire used to capture information was validated by subject experts.

Knowledge questionnaire was designed with 20 statements, to assess the awareness of renal dietary information – viz a viz fluid (12 items), sodium (10 items), potassium (15 items) and protein (13 items) components of various foods based on the nutrient content with response of correct, incorrect and do not know [Goplan C., et. al(1989)<sup>8</sup>]. An individualised dietary counselling session along with details of food chart was provided to all patients at the initiation of dialysis therapy. Timely follow up diet counselling sessions (group/individual) was organised to emphasise and update their knowledge on renal dietary regimen.

Renal Diet Attitude Questionnaire (RDAQ) was framed with 26 statements to obtain their attitude on diet and fluid adherence. The 5 point Likert rating scale was used from 1-5 i.e., “strongly agree” to “strongly disagree”. Higher the scoring greater is the degree of adherence.

Renal Diet Behaviour Questionnaire (RABQ) comprised of 29 statements with course of rating from 1-5 as “Never” to “Always” using 5 point Likert rating scale. Greater the score greater is the degree of adherence which is in behavior.

### 2.3 Statistical Analysis

A standard theory for scoring was adapted to analyze the score and classified as;

- Inadequate level - <50% score
- Moderate level – 51 – 75% score
- Adequate level - >75% [Snedecor G.W., Cochran W. G.(1967)<sup>9</sup>]

A  $\chi^2$  test for association was employed to obtain statistical significance of age with knowledge, attitude and behavior for adherence to renal dietary regimen. MINI Tab 7.0 package was used for analysis.

## 3. Results and Discussion

### 3.1 Results

#### 3.1.1 Demographic profile of Respondents

Background information of Respondents are shown in Table 1.

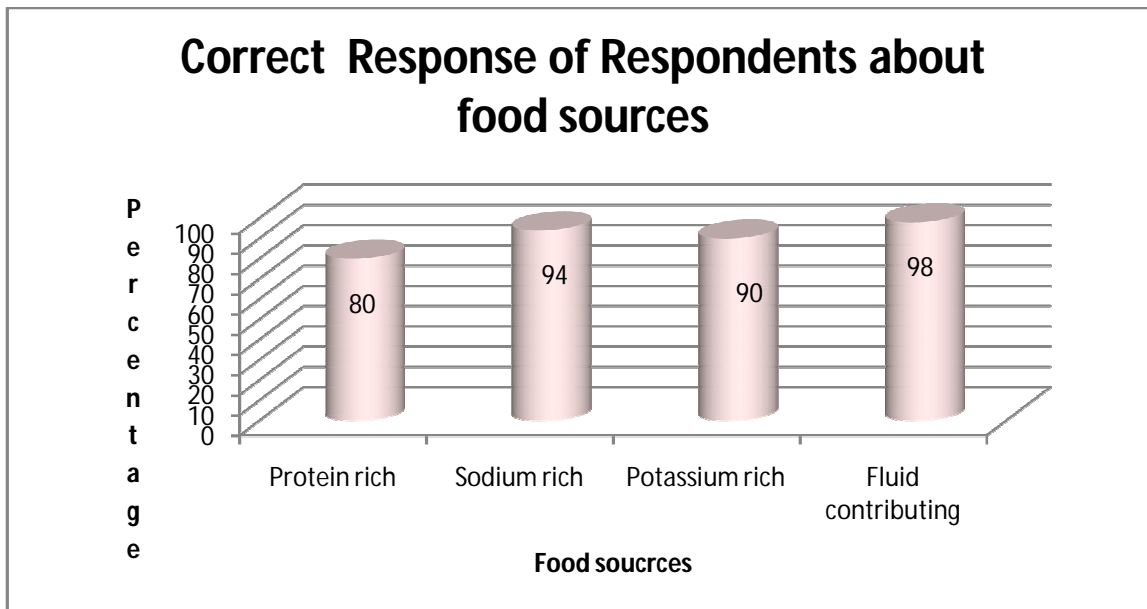
Characteristics	Category	Respondents	
		Number	Percent
Age group (years)	25 - 40	15	30.0
	40 - 55	19	38.0
	55 - 65	16	32.0
Gender	Male	37	74.0
	Female	13	26.0
Co-morbidity	Diabetics	26	52.0
	Non-diabetics	24	48.0
Frequency of dialysis	Twice weekly	30	60.0
	Thrice weekly	20	40.0
Dialysis vintage (months)	4 - 12	15	30.0
	13 - 24	20	40.0
	25 - 36	15	30.0

**Table 1: Demographic profile of Respondents**

The above table depicts the demographic characteristics of the hemodialysis patient group. The Mean±SD of age was 48.62±12.89 years and 38% of our patients were in the age group of 40–55 years. 74% of the sample belonged to male gender. The predominant comorbid condition was diabetes mellitus comprising of 52% in our study population and 60% of the study group opted for twice weekly dialysis regimen with 40% belonging to 13–24 months duration of dialysis.

### 3.1.2 Knowledge on Adherence of Renal Dietary Regimen

Indication of knowledge on adherence of renal dietary regimen of Respondents are shown in Figure 1.



**Figure 1: Indication of Knowledge on Adherence of Renal Dietary Regimen**

There was adequate knowledge among the study patients regarding protein rich, sodium rich, potassium rich and fluid contributing food sources as depicted by Figure 1.

### 3.1.3 Attitude Level on Adherence to Renal Dietary Regimen

Classification of respondents’ attitude level on adherence to renal dietary regimen are shown in Table 2

Attitude level	Category	Respondents	
		Number	Percent
Moderate	51 – 75% score	27	54.0
Adequate	76 – 100% score	23	46.0
Total		50	100.0

Mean = 97.42, SD = 13.1

**Table 2: Classification of Respondents’ Attitude Level on Adherence to Renal Dietary Regimen**

Attitude level on adherence to dietary management 54% of the study patients were in the moderate scoring while 46% were in the adequate level.

### 3.1.4 Behavior Level on Adherence to Renal Dietary Regimen

Classification of respondents’ behavior level on adherence to renal dietary regimen are shown in Table 3

Behavior level	Category	Respondents	
		Number	Percent
Inadequate	< 50% score	25	50.0
Moderate	51 – 75% score	25	50.0
Total		50	100.0

Mean = 72.56, SD = 10.5

**Table 3: Classification of Respondents’ Behavior Level on Adherence to Renal Dietary Regimen**

Only 50% of the study patients had moderate behavior level when assessed for behavioral level on adherence to renal diet. The score was considered inadequate in remaining 50% of the patients.

### 3.1.5 Adherence of Respondents to Potassium and Fluid Restrictions

Adherence to serum potassium level, fluid based on diet choice among respondents is shown in Table 4

Diet Choice	Serum Potassium Level (mEq/L)				Interdialytic Weight gain (kg)			
	≤ 5.1		> 5.1		≤ 3.0		> 3.1	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Vegetarian	17	34	6	12	10	20	13	26
Non-Vegetarian	17	34	10	20	10	20	17	34
$\chi^2$	0.409 NS (p>0.05)				0.646 NS (p>0.05)			

**Table 4: Association between Diet Choice with Serum Potassium Level and Fluid Adherence**

Adherence to potassium restrictions was 68% while that of fluid limitation was 40%. Though vegetarians were 46% and non-vegetarians were 56% there was no statistical difference for both potassium and fluid adherence to renal dietary regimen. 60% of our study patients found difficulty in adhering to fluid restrictions as indicated in their interdialytic weight gain in Table 4.

### 3.1.6 Adherence of Renal Dietary Regimen and Age

Age and Adherence of renal dietary regimen based on Knowledge, Attitude and Behavior are shown in Table 5

**Table 5: Association between Age with Knowledge, Attitude and Behavior Level on Adherence to Renal Dietary Regimen**

Aspectwise	Scoring level	Age group (years)						$\chi^2$ value
		<40		40 - 55		55 - 65		
		Number	Percent	Number	Percent	Number	Percent	
Knowledge	90-95%	9	60.0	12	63.2	8	50.0	0.65 NS (p>0.05)
	96-100%	6	40.0	7	36.8	8	50.0	
Attitude	51-75%	9	60.0	8	42.1	10	62.5	1.77 NS (p>0.05)
	>75%	6	40.0	11	57.9	6	37.5	
Behaviour	<50%	3	20.0	11	57.9	11	68.7	8.12* (p<0.05)
	51-75%	12	80.0	8	42.1	5	31.3	

\* Significant at 5% level NS: Non-Significant

The study patients were aware of renal dietary management, 63.2% of the patients in age group of 40-55 years noticed had adequate knowledge score 90-95% as compared to 50% of the respondents in the age group of 55-65 years found highly adequate (96-100%) knowledge. The attitude of adherence to renal dietary regimen was 62.5% in the age group of 55-65 years having moderate score in comparison with 57.9% in 40-55 years age group. Irrespective of age, knowledge and attitude were found to be more or less similar and established statistical non-significance (p>0.05).

We observed in behavioral level on adherence to renal dietary regimen about 80% of the respondents in the moderate scoring range among 24 - 40 years age group as compared to 68.7% of respondents in the inadequate scoring range among 55-65 years age group. There exists a significant difference with respect to behavioral level among age group in the study. ( $\chi^2=8.12^*$ , p<0.05).

In the present study we found that though patients had high adequate knowledge, the scores for attitude level was adequate, their behavior level on adherence to renal dietary regimen was inadequate.

### 3.2 Discussion

Role of nutritionist in medical nutrition therapy is immense. A renal nutritionist examines the process of nourishment and the association between diet, disease and health. They work as part of a multi-disciplinary team/supporting the work of other health care professionals. Nutrition intervention becomes an important component in optimizing diet among renal patients from the time there is kidney dysfunction. Consistent monitoring is essential to improve nutritional status. A structured dietary counseling skills navigate the treatment mode in renal ailment i.e., conservative line of management, hemodialysis, peritoneal dialysis and transplantation.

We infer from our study that there is adequate knowledge on renal dietary regimen probably due to nutrition intervention, while attitude level was scored "adequate to moderate" and behavior level was scored from "moderate to inadequate" depicting poor adherence to diet. Attitude depends not only on awareness but also on factors like social support, finance, dialysis regimen, co morbidity, availability and palatability of food.

The behavioral level was inadequate among older age group probably as they were unable/unwilling to change their habitual dietary practices. Diet adherence was achieved while fluid adherence was not achieved probably due to other factors like diet preferences, climate, dialysis schedule, distance of travel to dialysis center, and thirst. Interdialytic weight gain depends on fluid and water intake between dialysis session. A study conducted by Fincham D., 2008<sup>10</sup> found that the interdialytic weight gain should be between 0.5 – 1.0kg/day.

#### **4. Conclusion**

The study has shown that knowledge, attitude and behavior of diet and fluid adherence are independent variables. There is no correlation between knowledge, attitude and practice of renal dietary recommendations among maintenance hemodialysis population at our tertiary care centre. There was poor adherence to potassium and fluid restrictions.

Perhaps perceived and effective counseling sessions might obtain satisfactory dietary compliance and improve quality of life and survival.

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