



Original Article

Dietary and Fluid Regime Adherence in Chronic Kidney Disease Patients

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ABSTRACT

Introduction: Patients with Chronic Kidney Disease (CKD) needs to modify their lifestyle chiefly focusing on diet and fluid intake as the prognosis of these patients largely depends on adherence to the recommended nutritional regime. Non adherence to the suggested diet and fluids regime leads to rapid worsening of the condition.

Methods: Cross sectional survey was conducted to determine the level of adherence to the dietary and fluids restriction among CKD patients. Inclusion criteria's was, age between 18- 65 years, patients with CKD for at least 6 months and received dietary counseling. Consecutive sampling technique was used to select 100 patients. Data was collected with self-reported Dialysis Diet and Fluid non adherence Questionnaire (DDFQ).

Results: Majority (73%) of the subjects was males, 64% belongs to 40-60 years age, majority of them were unemployed. Mean Body Mass Index (BMI) was 20.52 kg/m², the mean duration of the treatment is 2.15 years and mean fluid intake was 2153ml ml/day and inter-dialytic weight gain was 1.48 kg. Regarding adherence, 20% of them had mild deviation and 69% of them had moderate deviation from dietary restrictions and similarly 69 % of the participants had moderate deviation, and 22% of them had mild deviation from fluid restriction guidelines. Low level of adherence to fluid and diet restrictions was noted in illiterate patients which was significant P<0.05.

Conclusion: In spite of the dietary counseling, considerable proportions of the patients were non adherent to the diet and fluid restrictions which necessitate regular counseling to patient and family members.

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Introduction

CKD is defined as derangement of kidney function and gross structure, which is there for more than a period of three months. CKD is a prolonged illness which commonly coexists usually with hypertension and diabetes. As a result of this, patients have to take a huge number of pills. They also have to be under strict dietary and fluid restriction.^{1,2}

Consequently, this leads to a greater personal as well as financial burden on the person and his family. This shows that adherence to dietary and fluid restrictions in patients with CKD are of major concern. Adherence is defined as the degree to which individuals stick to the medical advice given to them for the purpose of treatment. The dietary adaptations play a vital role in maintaining the kidney function among patients with CKD. The dietary modifications such as changes in the energy intake, intake of macronutrients, minerals and fluids can significantly reduce the risk for increased mortality and morbidity.³⁻⁵ It has been observed that between 20 - 78% of the patients are non-adherent to diet and fluid restrictions because of the modification in their long-standing individual routine life.

Even though the outcome of patients with end stage renal disease is positively altered by hemodialysis, the course of illness is adversely affected by the patient's non-adherence to the prescribed restrictions.⁶ This non adherence to the recommended dietary and fluid regime

can be improved by reinforcing dietary guidelines and adequate concept understanding by patient and family members. Nurses play a key role in improving their dietary regime and increasing their awareness about its importance in disease control.

Materials and methods

Cross Sectional survey design was conducted to determine level of adherence to the dietary and fluids restriction and to assess their perceived social support among CKD patients undergoing treatment and follow up in a tertiary care center in south India. Inclusion criteria were, age between 18- 65 years, patients diagnosed with CKD for at least 6 month duration of disease and received dietary counseling. CKD patients who were critically ill were excluded. Consecutive sampling technique was used.

Sampling size calculation: Sample size is estimated using the statistical formula for estimating a single proportion. It is expected that 50% of CKD patients non adherent to dietary and fluid restriction with 10% relative precision with 95% confidence interval.⁶ The sample size is estimated to be n=100. All the CKD patients who were undergoing dialysis or attending Out Patient Department (OPD) for follow-up and who met inclusion criteria was included in the study. After the study was approved by under graduate research monitoring committee, institute ethics committee

approval was obtained. Ethical issues involved were less than minimal risk category as the data was collected through the personal interview only. Personal interview was conducted at one time from eligible CKD patients with the help of self-reported Dialysis Diet and Fluid Non Adherence questionnaire (DDFQ) which has internal consistency of 0.89 with criterion related validity of $r=0.6$.

The DDFQ has four items which focuses on degree of deviation from diet and fluid guideline and number of days deviated from guideline for last two weeks. After getting the content validity, the data collection preform was administered for all subjects. Parameters studied were level adherence to dietary restrictions, adherence to fluid restriction.

The distribution of categorical data such as socio demographic profile, comorbidity history, personal history, fluid and dietary history etc., was expressed as frequency and percentages. The continuous data such as age, duration of disease, number of dialysis per week, Inter-dialytic weight gain was expressed as mean with standard deviation or median with range. The level of adherence and its association with demographic variables was analyzed with chi-square test with all the statistical analysis was carried out at 5% level of significance and $p<0.05$ was considered as significant.

Results

Majority (73% of the subjects were males, 64% belongs to 40-60 years age and majority of them were unemployed and 48% of them were not educated (Table 1).

Table 1. Sample characteristics

Socio demographic variables	N (%)
Gender	
Male	73 (73)
Female	27 (27)
Age	
18-20 years	7 (7)
21-40 years	29 (29)
41-60 years	64 (64)
Marital status	14 (14)
Married	86 (86)
Education	
Illiterate	48 (48)
High school	20 (20)
Higher secondary	15 (15)
Under graduate	13 (13)
Post graduate	4 (4)
Occupation	
Unemployed	72 (72)
Employed	28 (28)

The mean BMI was 20.52 kg/m², the mean duration of the treatment for CKD is 2.15¹ years and mean fluid intake was 570 ml/day for hemodialysis patients, 1344 ml for non-hemodialysis patients and interdialytic weight gain was 1.48kg (Table 2).

All of the participants were nonsmoker and nonalcoholic after the diagnosis of CKD and all of them received Nutritional education on diet and fluid restrictions (Table 3).

Fig.1 shows that 20% of them had mild deviation and 69% of them had moderate deviation from dietary restrictions guidelines. Fig 2 shows that 69 % of the participants had moderate deviation, and 22% of them had mild deviation from fluid restriction guidelines. There is no association with different categories of age

Table 2. Clinical profile (a) of sample

Clinical profile	Mean(SD)	Range
Height (cm)	161.53 (6)	140 – 174
Weight (kg)	54.19(10)	25.5 - 89
BMI (Kg/m Sq.2)	20.52(3)	12 – 34.7
Years of treatment for CKD	2.15(1)	0.5 – 10
Dialysis duration in hours	2.47(1)	0- 4
Fluid intake/day(ml)		
For hemodialysis patients	570.63	144
For Non hemodialysis patients	1344.59(319)	600-1448
Weight gain (kg)	1.48 (0.76)	0.5 – 3
Bio Chemical Parameters		
Urea	92.32(39)	19-249
Creatinine	6.64 (3)	1-25
Sodium	141.99 (7)	113-160
Potassium	4.56 (1)	3-6.8
Albumin	4.13 (0.9)	2.4-5
Calcium	8.13 (1)	7-10.4
Hemoglobin	9.70 (2)	4.5-14

Table 3. Clinical profile (b) of sample

Clinical profile	N (%)
Smoking history	
Smoker	0 (0)
Non smoker	100 (100)
Alcohol consumption	
Yes	0 (0)
No	100 (100)
Co morbidity history	
Absent	5 (5)
Hypertension	72 (72)
Diabetes mellitus	2 (2)
Both hypertension and diabetes mellitus	21 (21)
Frequency of dialysis	
Twice a week	37 (37)
Thrice a week	26 (26)
Type of dialysis	
On hemodialysis	63 (63)
Without dialysis	37 (37)
Received nutritional education	
Yes	100 (100)
Awareness of dietary restrictions	
Yes	100 (100)
Awareness of importance of fluid restrictions	
Yes	100 (100)

and sex with adherence level, however the participants education is associated with level of adherence at $P<0.05$ level as illiterates had more deviated from guidelines (Table 4). There is no association with gender with adherence level, however the participants education and age is associated with level of adherence at $P<0.05$ level as illiterates and participants between 21-40 years of age had more deviated from guidelines (Table 5).

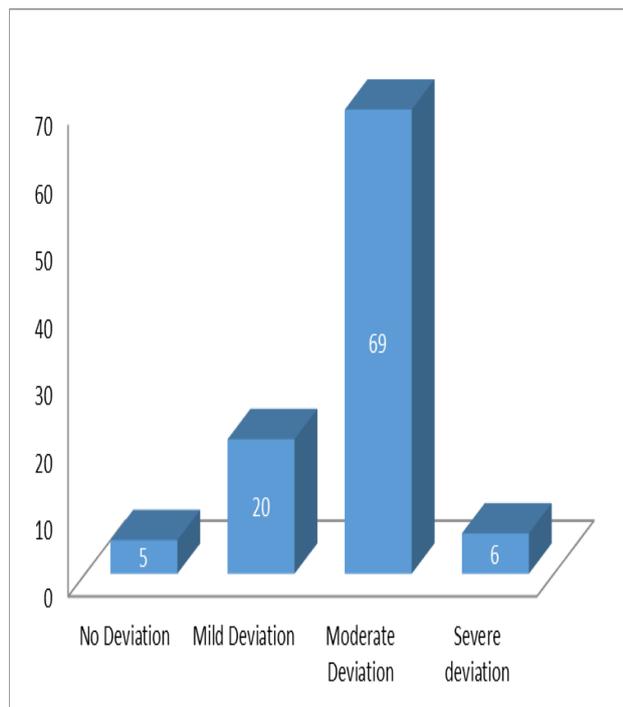


Fig 1. Degree of deviation from diet guidelines

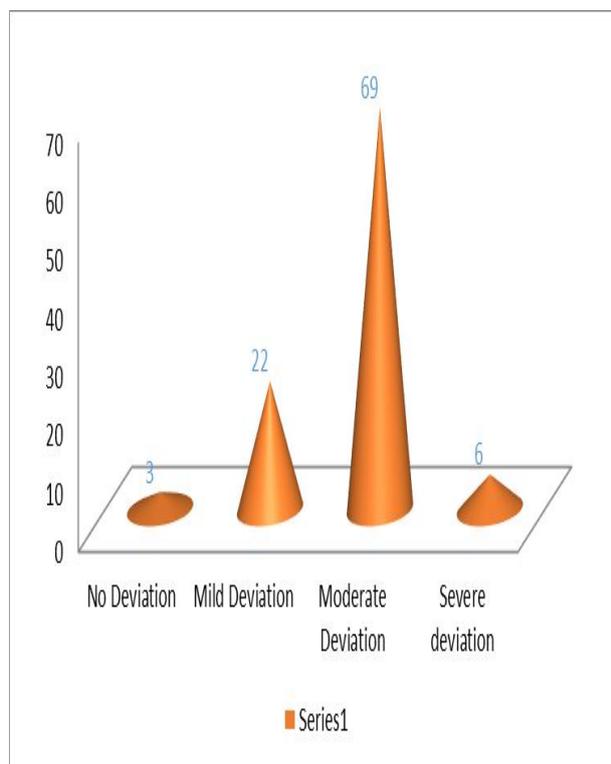


Fig 2. Degree of deviation from fluid guidelines

Table 4. Association of diet adherence level with demographic variables

Variables	Diet Adherence				P*
	No Dev.	Mild Dev.	Moderate Dev.	Severe Dev	
Age					0.42
18 – 20	0	0	7	0	
21 – 40	3	7	17	2	
41-60	2	13	45	4	
Gender					0.71
Male	4	16	48	5	
Female	1	4	21	1	
Education					0.02
Illiterate	0	11	35	2	
High school	0	2	15	3	
Higher-secondary	1	3	10	1	
Undergradua	3	2	8	0	
te					
Postgraduate	1	2	1	0	

Deviation

Table 5. Association of fluid adherence level with demographic variables

Variables	Fluid adherence				P*
	No Dev.	Mild Dev.	Moderate Dev.	Severe Dev	
Age					<0.001
18 – 20	2	1	4	0	
21 – 40	0	9	18	2	
41-60	1	12	47	4	
Gender					0.40
Male	1	17	50	5	
Female	2	5	19	1	
Education					<0.001
Illiterate	0	9	37	2	
High school	1	0	16	3	
Higher secondary	2	4	8	1	
Undergraduate	0	6	7	0	
Postgraduate	0	3	1	0	

Discussion

A large number of studies have documented the ill effects of non-adherence on the long time survival as well as the clinical outcomes among patients undergoing hemodialysis. The negative effect of non-adherence on clinical outcomes and survival in hemodialysis patients had been documented in reports with large cohorts.

Adherence to the dietary macronutrients, micro nutrients and fluid is essential for the patients with CKD to reduce morbidity. The effect of non-adherence to food and fluids has negative impact on clinical outcome.⁷⁻⁹ This study was intended to assess degree of adherence to diet and fluids by using Dialysis Diet and Fluid questionnaire. This study showed majority (73%) of the subjects was males, 64% belongs to 40-60 years age and majority of them were unemployed and 48 % of them were not educated. Similar results were noted in a study done by Nilofer et al., in which out of the 50 participants, majority was males 31 with the age ranging from 19-69 years. A period of 6 months to 9 years with a mean of 23 months was the average duration of dialysis therapy among the study participants.¹⁰

Barnett et al., done an exploratory study and identified

that the 26 patients who were identified as non-compliant to diet and fluid restrictions, had an inter-dialytic weight gain of more than 2.5 kg. In this study the inter dialytic weight gain was 1.48kg. In another study conducted by Rambod *et al.*, identified that majority of the participants (56%) were not adherent to fluid restrictions which led to increased interdialytic weight gain of 2.6 Kg.^{11,12}

In this study 20% of the participants had mild deviation of dietary guidelines and 69% of them had moderate deviation from dietary restrictions and similar percentages in deviation in fluid restriction (69% and 22%). comparable results noted in a study done by Mollaoglu M *et al.*, shown higher percentage of patients undergoing hemodialysis were non-adherent to the prescribed restrictions. The results of the study showcased that mild to very severe non-adherence to diet was reported in 66.7% of the subject, and mild to very severe non adherence in fluid restrictions was reported among 68.8% of the study participants. In another study, 81.4% patients showed a difficulty in following the prescribed diet and 74.6% of the patients had troubles with maintaining the prescribed fluid balance.¹³ The risk for non-adherence was highest among males of young age group and those who were smokers. There was an association between non-adherence and higher levels of weight gain during the interdialytic periods. However in present study as everybody received dietary counseling, nobody had very severe deviation and only 6% of them had severe deviation from dietary guideline which was comparatively improved results than other study results. In present study there no association with different categories of age and sex with diet adherence level, however the participants education is associated with level of adherence at $P < 0.05$ level as illiterates had more deviated from dietary and fluid guidelines the similar results noted in other studies also.^{11,12,14}

Conclusion

Adherence to the dietary and fluid components is essential to reduce the morbidity related to renal dysfunction. This study report suggests, in spite of nutritional counseling there is considerable proportion of patients have deviated from dietary guidelines which can be minimized with reinforcing counseling by nurses and other health care providers. In hemodialysis patients, the nurses and other health system personnel should identify strategies to improve communication with reinforcing dietary counseling to patients and family members to help them to adhere with treatment regimen, and dietary guidelines.

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Ethical issues

None to be declared.

Conflict of interest

The authors declare no conflict of interest in this study.

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