

**A descriptive study to assess fluid adherence among patient undergoing haemodialysis**

<sup>1</sup>Ms.Arti Gurung, AIIMS Guwahati, Changsari, Guwahati, Assam

**Corresponding Author:** Ms. Arti Gurung, AIIMS Guwahati, Changsari, Guwahati, Assam.

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**Abstract**

**Background:** Hospital Chronic kidney disease (CKD) is a global public health problem. CKD is defined as derangement of kidney function and gross structure, which is there for more than a period of three months. The most progressive stage of CKD with nearly complete loss of kidney function is the End stage renal disease (ESRD) which necessitates renal replacement therapy. Patients on haemodialysis must undergo significant adaptation, including adherence to dietary and fluid restrictions. Adherence is defined as the degree to which individuals stick to the medical advice given to them for the purpose of treatment.

The positive clinical outcome in ESRD patients undergoing hemodialysis mainly depends on strict adherence to the therapeutic regimens, even though patients are aware of the importance of compliance for sustaining good quality life, many clients fail to adhere to the treatment regimens

**Materials and methods:** A descriptive study was employed to assess fluid adherence among patient undergoing haemodialysis in Ramaiah hospital, Bangalore. Convenient sampling technique was used, and 150 patients undergoing haemodialysis was selected. Structured knowledge questionnaire, structured fluid

adherence checklist and digital weighing machine were used to collect the data.

**Result:** The study result shows that majority of the subjects 79 (52.7%) reported good adherence and 52 (34.7 %) of the subjects reported moderate adherence to fluid restriction recommendation. With regards to the IDWG, 101(67.3%) of the subject had an average inter-dialytic weight gain  $\geq 4\%$  of the dry weight and thus were non adherent to fluid restriction recommendations and only 49 (32.7 %) had IDWG  $< 4\%$  and were adherent to fluid restriction recommendations.

Self- reported adherence to fluid restrictions showed no significant with socio demographic variables except for religion ( $p=0.018$ ). Whereas IDWG showed association with monthly family income ( $p=0.012$ ) and type of family ( $p=0.037$ ) at 0.05 level of significance.

**Conclusion:** The study concluded that most of patient have reported good adherence to fluid restrictions but the actual (objective) adherence determined by IDWG was poor in majority of the patients undergoing hemodialysis.

**Keywords:** Chronic Kidney Disease, End Stage Renal Disease, Inter Dialytic Weight Gain, Adherence.

**Introduction**

CKD is defined as derangement of kidney function and gross structure, which is there for more than a period of three months. There are approximately 7.85 million

people suffering from chronic kidney disease in India.

The most progressive stage of CKD with nearly complete loss of kidney function is the End stage renal disease (ESRD). ESRD necessitates renal replacement therapy<sup>1</sup>.

Renal replacement therapy is available as renal transplantation and dialysis treatment. In dialysis, majority of patients opt for haemodialysis as the cost of peritoneal dialysis is two times higher than that of haemodialysis. Hemodialysis is a therapy that filters waste, removes extra fluid and balance electrolytes<sup>2</sup>.

Patients on haemodialysis must undergo significant adaptation, including adherence to dietary and fluid restrictions<sup>3</sup>. Adherence is defined as the degree to which individuals stick to the medical advice given to them for the purpose of treatment<sup>1</sup>. 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.

If the patient is non-adherent with fluid and diet restriction it will lead to increased inter-dialytic weight gain (IDWG). IDWG is defined as the difference between the pre-dialytic weight and weight at the end of the previous dialysis session and is mostly expressed as proportion of dry weight (DW) which is defined as the lowest weight without any extra fluid in the body which the patient can tolerate without the development of symptoms or hypotension<sup>4</sup>. IDWG should be lower than 4% of the dry weight<sup>5</sup>. Excessive IDWG necessitates more volume removal during haemodialysis.

High IDWG is associated with higher risk of all-cause and cardiovascular death and increased morbidity, such as ventricular hypertrophy and major adverse cardiac and cerebrovascular events. In addition, it leads to supplementary weekly dialysis sessions with consequent deterioration of quality of life and increased costs<sup>6</sup>.

Adherence to fluid restrictions gives a number of tangible benefits such as decreased cramps, reduction of symptomatic hypotensive episodes, increase activity levels, and a shorter time on dialysis.

Objective measures, such as IDWG, are often used as an indicator of adherence and to assume that there is a close correlation between the recommended treatment and desired results. However, objective measures may lack the ability to detect behaviour-related aspects of non-adherence. Often, hence, the combination of objective and subjective measures should be used to assess adherence more adequately<sup>4</sup>.

## Materials & Method

**Study Design:** The study used descriptive research design.

### Variables

- Study variables for the study includes fluid adherence among hemodialysis patients
- Attribute Variables in the study are Age, Gender, religion, education, occupation, monthly family income, place of residence, Marital status, type of family, availability of medical insurance, presence of comorbidity, frequency of dialysis, duration on HD treatment, no. of missed HD session, no. of shortened HD session, recommended daily fluid allowance, source of information regarding fluid restrictions.

**Setting of the study:** The study was carried out at Ramaiah Memorial Hospital, Bangalore.

**Sample size:** 150 hemodialysis patients.

**Sampling technique:** convenient sampling technique was used to select the samples.

### Inclusion and exclusion criteria

#### Inclusion criteria

- Above 18 years of age
- Willing to participate

- Able to read and understand English and Kannada.
- Have undergone hemodialysis for a minimum period of 6 months.

#### **Exclusion criteria**

Haemodialysis patient who

- Are diagnosed with mental illness
- Cannot read Kannada and English

#### **Development of tool**

After an extensive review of literature and discussion with experts, a structured knowledge questionnaire regarding fluid adherence and structured fluid adherence checklist hospital acquired infection and structured situational practice questionnaire regarding prevention of hospital acquired infection was developed by the researcher. The knowledge questionnaire included 10 items to assess patient's knowledge regarding fluid adherence and structured fluid adherence checklist consisted of 14 items to assess adherence to fluid restrictions among hemodialysis patients in the past 14 days and a calibrated digital weighing machine in the dialysis was used to check the IDWG

#### **Validity**

Content validity of the tool was established by inviting suggestions from experts that included 2 nephrologist and 7 nursing experts. There was 100% agreement between the experts on relevance of items included on the tool.

#### **Reliability**

The reliability of structured knowledge questionnaire regarding fluid adherence and structured fluid adherence checklist was assessed by Cronbach's alpha. The reliability of the tool was  $\alpha = 0.713$  and  $\alpha = 0.702$ , respectively.

The reliability of the Kannada translated version of the tool was 0.723 and 0.742 respectively

The calibration of the weighing machine was done

#### **Ethical clearance**

The ethical clearance for this study was obtained from the ethics committee of Ramaiah Institute of Nursing Education and Research.

#### **Pilot study**

Pilot study was conducted at Isolation dialysis unit in Ramaiah Hospital Bangalore, A total of 15 hemodialysis patient were selected for the study. On completion of pilot study, it was found that it was feasible to undertake main study.

#### **Data collection procedure**

The data was collected in Ramaiah memorial Hospital, Bangalore after obtaining formal permission from the concerned authorities. A total of 150 Haemodialysis patients who met the inclusion criteria were selected. Subjects were given detailed information about the study and informed consent was obtained from all the subjects. Data were obtained by using structured knowledge questionnaire and structured fluid adherence checklist. The time taken by each subject was about 10-15 minutes to complete the questionnaire. Approximately 10-15 subjects were assessed per day. Subject's post-HD weight was recorded and the pre-HD weight of the same subject in the next session was checked to calculate IDWG. IDWG was calculated consecutively over 3 sessions to get an average IDWG. The collected data were coded and entered in the master sheet.

#### **Statistical method**

The data analysis was done by using descriptive and inferential statistics. SPSS (version 20) was used to analyse the data.

1. Frequency and percentage distribution were computed for sociodemographic characteristics.
2. Frequency and percentage distribution were computed for knowledge.

3. Frequency and percentage distribution were computed for self-reported fluid adherence.
4. Frequency and percentage distribution were computed for average inter-dialytic weight gain.
5. Chi square was used to find association between self-reported fluid adherence and socio demographic variables
6. Chi square was used to find association between average inter-dialytic weight gain and socio demographic variables

## Results

The collected data were analysed according to the objectives of study. The findings are presented below.

### I. Socio demographic characteristics of the subjects.

Frequency and percentage distribution were computed for sociodemographic characteristics of the subjects. It was observed that 24% of the subjects belonged to age group of (60-70) years, majority of the subjects were male 68.7%, 75.3% of subjects belonged to Hindu religion, most of the subjects 32% were high school pass, 37% of the subjects were unemployed, 61.3% of the subject have a monthly income of (20000-60000) rupees, 90.3% of subjects belonged to urban areas, 86.7% of subjects were married, More than half of the subjects, 58.7% belonged to nuclear family, 57.3% of subjects did not have medical insurance, 62.7% of subjects have comorbidities other than CKD, 46.7% of the subjects have been undergoing haemodialysis for less than a year, 84.7% of the subjects had been undergoing haemodialysis thrice in a week, majority of the subject 93.3% did not miss any dialysis session, majority of subjects 92.7% did not shorten any dialysis session. With regards to the fluid intake, majority of the subjects 74% had recommended fluid intake of 500-750 ml, majority of subjects 95% received information regarding fluid restriction from a doctor.

### II. Frequency and percentage distribution of subjects based on knowledge.

Majority of the subjects 91.3% had adequate knowledge regarding fluid restriction recommendations and 8.7% of the subjects has moderate knowledge regarding fluid restriction recommendations

### III. Frequency and percentage distribution of subjects based on self-reported fluid adherence.

Majority of the subjects 52.7% subjects had good adherence to fluid restriction recommendations and 34.7% of the subjects had moderate adherence to fluid restriction recommendations

### IV. Frequency and percentage distribution of subjects based on average IDWG

Majority of the subjects 67.3% had an average IDWG of  $\geq 4\%$  of dry weight and 32.7% of subject had IDWG of  $< 4\%$  of the dry weight.

### V. Association between self-reported fluid adherence and sociodemographic variables.

Chi square was used to find the association between sociodemographic characteristics and self-reported fluid adherence. It was observed that there was no significant association between socio demographic characteristics and self-reported fluid adherence.

### VI. Association between average IDWG and sociodemographic variables.

Chi square was used to find the association between sociodemographic characteristics and practice of the novice nurses. It was observed that there was significant association between averages DWG and monthly income ( $p = 0.012$ ) and type of family ( $p = 0.037$ ). Other socio-demographic characteristics did not show any association with average inters-dialytic weight gain.

## Discussion

Patients on haemodialysis must undergo significant adaptation, including adherence to dietary and fluid

restrictions 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. Non-adherence to fluid restrictions can cause increased IDWG, High IDWG is associated with higher risk of all-cause cardiovascular death and increased morbidity, such as ventricular hypertrophy and major adverse cardiac and cerebrovascular events. Thus monitoring fluid adherence is a crucial function of dialysis nurse .Hence, this study aims to determine fluid adherence among hemodialysis patients.

Based on the result of present study majority of the subjects (52.7%) reported good adherence and (34.7 %) of the subjects reported moderate adherence to fluid restriction recommendation. In contradiction the present study result is inconsistent with the result reported in a study conducted by Harish Beerappa et al in Manipal, Karnataka on Adherence to dietary and fluid restrictions among patients undergoing hemodialysis and the result of the study showed that 28.3 % of the subjects reported adherence to fluid restrictions and 71.7 % of the subjects reported non-adherence to fluid restriction recommendations<sup>7</sup>

In the present study 101(67.3%) of the subject had an average IDWG  $\geq 4\%$  of the dry weight and thus were non adherent to fluid restriction recommendations and only 49 (32.7 %) had IDWG  $< 4\%$  of the dry weight. The finding was supported by an exploratory study conducted by Masoume Rambod et al. on dietary and fluid adherence among Iranian hemodialysis patients and the result of the study showed that 56%of subject had an average IDWG more than the recommended suggesting non adherence to fluid restriction recommendations<sup>8</sup>.

In the present study although the self-reported adherence was good in majority of the subjects 52.7% and 34.7 %

of subjects reported moderate adherence, the actual adherence was seen in only 32.7% of the subjects and majority of the subjects 67.3% were non adherent to fluid restriction recommendations

The findings of the study showed that there was no statistical association between self- reported fluid adherence and socio demographic variables .The study finding was supported by a descriptive cross-section study conducted by Niraj Beendra Kumar et al. (2017) on dietary and fluid regime among hemodialysis patients, which revealed that there was no association between fluid adherence and socio demographic variables<sup>1</sup>.

The present study revealed that there was significant association between average IDWG and selected socio demographic variable –monthly income (p =0.012) and type of family (p = 0.037).In contradiction the present study result is inconsistent with the result reported in a study conducted by M Anujaet al. (2018) on Compliance to fluid and dietary restriction and treatment adherence among chronic hemodialysis patients in a tertiary care hospital, Puducherry and the result of the study revealed that there was no significant association between fluid adherence and socio demographic variables such as age , type of family, monthly income , except for marital status (p=0.01) had significant association with fluid adherence.

### Limitations

- Authenticity of the information regarding socio-demographic variables is based on the response of the subjects.
- Limited sample size.

### Conclusion

The findings of the study revealed that majority of the patient have reported good adherence to fluid restrictions but the actual (objective) adherence was poor in majority of the patients undergoing hemodialysis. Monthly compliance progress report can be initiated in hospital by

dialysis nurse to discuss regarding non adherent behaviour and can provide ongoing education for those experiencing difficulty in adhering to fluid restrictions to improve fluid adherence among hemodialysis patients.

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