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A Study to Assess the Effect of Nursing Interventions Regarding Dietary and Fluid Conformity on Selected Physical and Biophysical Parameters among Patients Undergoing Haemodialysis

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Abstract

Patients undergoing hemodialysis often experience significant changes in their dietary and fluid intake due to restrictions imposed by their condition. Nursing interventions aimed at promoting dietary and fluid conformity can help improve the physical and biophysical parameters of these patients. ***Objective:*** *The objective of this study was to assess the effect of nursing interventions regarding dietary and fluid conformity on selected physical and biophysical parameters among patients undergoing hemodialysis in selected hospitals.* ***Methodology****: A pre-experimental, pre-test post-test research design was adopted for the study. Thirty samples that fulfilled the inclusion criteria were selected for the study using a structured selection process. A structured demographic performa was used to collect demographic data, and a structured questionnaire to assess knowledge. The researcher established the reliability and validity of the tools. Inferential and descriptive statistics were used to analyse the data.* ***Result:*** *Before the intervention, the majority of the patients (63.3%) had average knowledge, while 30% had poor knowledge and only 6.67% had good knowledge. However, after the intervention, none of the patients had poor knowledge, and 66.67% had good knowledge, while 33.33% had average knowledge. In posttest data, 43.33% of the Patients had hypotension, 30% had a BMI less than 18.5, 53.33% had no edema, 36.67% had a creatinine level between 0.7-1.3 mg/dL, 33.33% had a urea level between 6-24 mg/dL, 26.67% had a sodium level between 135-145 mEq/L, and 50% had a potassium level less than 3.6 mmol/L. In addition, 36.67% had a hemoglobin level below 13.2 gm/dl for males and below 11.6 gm/dl for females, while 40% had a hemoglobin level between 13.2-16.6 gm/dl for males and between 11.6-15 gm/dl for females. However, there was a significant association found between knowledge scores and the duration of hemodialysis.* ***Conclusion:*** *The findings of this study suggest that nursing interventions aimed at promoting dietary and fluid conformity can significantly improve the physical and biophysical parameters of patients undergoing hemodialysis. These interventions can be incorporated into routine care to help improve the health outcomes of patients with chronic kidney disease.*

Keywords: *Dietary and Fluid Conformity, Physical and Biophysical Parameters, Hemodialysis, Nursing Intervention.*

INTRODUCTION

End-stage renal disease (ESRD) has grown to be a significant global public health issue. According to a 2018 estimate, India has roughly 175,000 chronic dialysis patients, translating to a prevalence rate of 129 in million people.[1] Complete or almost complete kidney failure that is permanent is known as end stage renal disease. If intermittent treatment and/or kidney transplantation are not used as interventions, there is a gradual and usually permanent loss in kidney function that is

eventually deadly. Haemodialysis (HD) is utilized when the kidneys are able to continuously filter wastes, salts, etc liquids from the blood. In order to maintain an active lifestyle despite severe renal failure, hemodialysing is one treatment option.[2] Since the HD cannot completely replace the kidney's functions; patients must adhere to rigorous hydration and nutritional limitations. Patients receiving haemodialysis on one hand, must manage and strictly adhere to a comprehensive treatment plan that includes food restrictions and hydration restrictions.[3] Patients undergoing haemodialysis are need to follow a rigorous treatment regimen that includes consistent HD sessions, strong dietary restrictions, a demanding medication schedule, and frequent exercise. Failure to follow this schedule might have detrimental short- and long-term impacts on health and survival. The incidence of emergency room and hospital admissions may rise temporarily if treatment regimens are not followed.[4] Mortality and the emergence of other co-morbidities including cardiovascular disease are possible long-term effects. Poor eating habits may result in lower life expectancy, morbidity, and death in dialysis patients.[5]The health and survival of patients are greatly impacted by nursing interventions that encourage food compliance in HD patients. In order to monitor and improve compliance and therefore boost clinical outcomes, nurses are in a great position.[6]Compared to other healthcare providers, they have greater face-to-face interactional time to emphasize the value of compliance.[7]The job of a nurse in helping a patient adjust to a new life is crucial. In order to increase adherence and the level of life for HD patients, nurses may provide nursing interventions that aid patients in understanding their condition and that teach them how to take care of themselves.[8]

Need for The Study

According to a comprehensive analysis, almost two thirds of renal failure patients in 2010 passed away without obtaining dialysis. Comparing India to other nations with middle and low incomes with a comparable sociodemographic index reveals that the burden for kidney failure fatalities is higher in India, indicating that even without the available resources, the rate of death in India may be reduced.[9]Avesani et al. used a device that objectively tracked the activity actually done to measure the number of footsteps per day, activity-related energy expenditure, and levels of exercise in HD patients. This research demonstrated that HD patients daily step count and estimated metrics were consistent with a sedentary state, and that performance was considerably poorer on dialysis days. [10]These results underlined the idea that a low level of physical activity is a frequent and ongoing burden in HD patients across the globe and corroborated the low level of physical activity previously documented by other researchers employing pedometers or patient self-reports. [11]At all chronic kidney disease (CKD) phases, from initial manifestations to ESRD, enrolling patients in exercise programs is a difficult task. Information on exercise habits and effects in ESRD patients is mostly derived from observations, registry data, or small-scale clinical trials.[12]

Aim of The Study

The aim of this study was to assess the effect of nursing interventions regarding dietary and fluid conformity on selected physical and biophysical parameters among patients undergoing hemodialysis in selected hospitals

METHEDOLOGY

Hypothesis H0: There is no significant effect of nursing interventions related to dietary and fluid adherence on physical and biophysical parameters.

To achieve the objectives, a one-group pre-test/post-test design was employed.

The independent variables in this study consisted of nursing interventions pertaining to dietary and fluid adherence among patients undergoing hemodialysis, while the dependent variables encompassed physical and biophysical parameters. The study was conducted in selected hospitals within Pune city, with the target population comprising patients undergoing hemodialysis in these hospitals. The sample consisted of 30 hemodialysis patients from dialysis units, ICUs, and renal transplant units.

Purposive sampling was employed to select participants who met the study's inclusion criteria, which included patients undergoing hemodialysis for at least one month and receiving treatment at least once a week. Patients with low blood pressure values below 90 mm Hg systolic or 60 mm Hg diastolic, as well as critically ill patients, were excluded from the study.

To achieve the study's objectives, four tools were used, each carefully reviewed by a panel of 16 specialists to ensure accuracy and reliability. These tools encompassed the collection of socio-demographic and clinical profiles, assessment of physical and biophysical parameters, documentation of biochemical indicators, and a questionnaire to assess knowledge. The reliability of the knowledge assessment tool was determined using Pearson's formula, resulting in a calculated Pearson (r) coefficient of 0.9514, indicating strong tool reliability. Internal consistency was also assessed using Cronbach's alpha formula, yielding a knowledge consistency score of 0.89, further confirming the tool's reliability.

Prior to the main study, a pilot study was conducted with a sample size of six participants to assess the feasibility of the research, refine the methodology, and gather initial insights. The results of the pilot study provided valuable groundwork for the subsequent larger-scale investigation.

RESULTS

Demographic Data

The demographic data shows that 46.67% were in group 20-40 years, 36.67 % of patients were in the age group of 40-60 years, and 16.67% of patients were in 60-80 year of age group. The gender distribution shows that 60% of the individuals were male and 40% were female. Regarding occupation, 60% of the individuals were employed in the government sector, 16.67% were employed in the private sector, and 23.33% were unemployed. The findings shows that 3% of patients were illiterate, 6.67 % of patients complete their school, 46.67 % of patients had undergraduate degree and 4.33% of patients completed their master degree. In terms of family income, the majority of the individuals 40% had a family income below 15000/-, 26.67% had a family income between 15000/- to 30000/- while 33.33% had a family income of 30000/- and above. The frequency of hemodialysis varied, with 43.33% of the individuals undergoing hemodialysis once a week, while 26.67% of individuals undergoing twice a week, while 30.00% underwent hemodialysis three times a week. Near half of patients duration of dialysis was between 1-6 month, 20% of patients have duration between 6-12 month and 30% of patients were on haemodialysis more than 12 months.

Section I

Effect of nursing interventions regarding dietary and fluid conformity on knowledge and selected physical and biophysical parameter.

This part examined the impact of nurse interventions on patients receiving hemodialysis in terms of knowledge and a few chosen physical and biophysical markers.

“Paired t-test” was the best, to assess the effect of nursing interventions regarding dietary and fluid conformity on knowledge.

Table 1: Effect of nursing interventions regarding dietary and fluid conformity on knowledge and selected physical and biophysical parameters *N=30*

Effectiveness Knowledge	Mean	SD	T value	P value
Pre Test	10	4.23	5.97	<.0001
Post Test	15.83	2.9		

Data presented in above table shows that mean pretest score and S.D. was 10, 4.23 respectively. Mean posttest and S.D. was 15.83, 2.9 respectively. Calculated "t" value was 5.97, df=29 and "p" value was less than 0.0001. Calculated "t" value was greater than tabulated t value, which showed that there was a significant difference in knowledge score after administration of nursing intervention. Hence we are rejecting the null hypothesis and accepting alternate hypothesis that there is significant increase in knowledge. Hence, conclusion was drawn that nursing intervention was effective in increasing knowledge regarding dietary and fluid conformity.

Therefore the research hypothesis "there is significant relationship between pretest knowledge levels regarding dietary as well as fluid complying among patients having hemodialysis and their selected demographic variables" is both partially accepted and rejected at the 0.05 level of significant.

Section II

Physical and Biophysical Parameters & Biochemical indicator datasheet

Table 2: Frequency and percentages of distribution as Pre-test & Post-test Physical and Biophysical Parameters & Biochemical indicator samples. N= 30

	Pre Test		Post Test	
Physical and Biophysical Parameters	**Frequency**	**Percentage**	**Frequency**	**Percentage**
1. Blood Pressure				
a) Hypotension (90-120/60-80 mm of hg)	12	40.00	13	43.33
b) Normal (120/80 mm of hg)	5	16.67	6	20.00
c) Prehypertension (SBP= 120-139, DBP= 80-90)	4	13.33	9	30.00
d) Stage I hypertension (SBP= 140-159, DBP= 90-99)	7	23.33	3	10.00
e) Stage II hypertension (SBP >=160, DBP >= 100)	2	6.67	0	0.00
2. BMI				
a) BMI <18.5	11	36.67	9	30.00
b) BMI 18.5-24.9	2	6.67	5	16.67
c) BMI 25-29.9	9	30.00	13	43.33
d) BMI >30	8	26.67	4	13.33
3. Degree of edema				
a) 0	8	26.67	16	53.33
b) 1+	6	20.00	4	13.33
c) 2+	7	23.33	4	13.33
d) 3+	5	16.67	5	16.67
e) 4+	4	13.33	2	6.67
Biochemical indicator data sheet				
1. Creatinine level				
a) < 0.7mg/dL	12	40.00	9	30.00
b) 0.7 – 1.3 mg/dL	8	26.67	11	36.67
c) > 1.3 mg/dL	10	33.33	11	36.67
2. Urea level				
a) <6	15	50.00	9	30.00
b) 6-24 mg/dl	7	23.33	10	33.33
c) >24 mg/dL	8	26.67	12	40.00
3. Sodium level				

a) <135 mEq/L	12	40.00	18	60.00
b) 135-145 mEq/L	9	30.00	8	26.67
c) > 145 mEq/L	9	30.00	5	16.67
4. Potassium level				
a) < 3.6 mmol/L	14	46.67	15	50.00
b) 3.6-5.2 mmol/L	6	20.00	7	23.33
c) > 5.2 mmol/L	10	33.33	9	30.00
5. Hemoglobin level				
a) For male <13.2 gm/dl , for female< 11.6 gm/dl	9	30.00	11	36.67
b) For male 13.2-16.6 gm/dl , for female 11.6-15 gm/dl	10	33.33	12	40.00
c) For male > 16.6 gm/dl , for female >15 gm/dl	11	36.67	8	26.67

Pre Test represents that in Blood pressure, 40% of samples were hypotensive, 16.67% of sample blood pressure were normal, 13.33% of sample blood pressure was in prehypertension stage, 23.33 of sample blood pressure was in stage I hypertension and 6.67% of sample blood pressure was in stage II hypertension. The table shows that in BMI, 36.6% of sample had BMI below 18.5, 6.67% of sample had BMI between 18.5-24.9, 30.0% of sample had BMI between 25-29.9 and 26.67% of sample had BMI above 30. In terms of Degree of edema, 26.67% of sample had 0 degree edema, 20% of sample had 1+ degree of edema, 23.33% of sample had 2+ degree of edema, 16.67 % of sample had 3+ degree of edema and 13.33 % of sample had 4+ degree of edema.

Regarding creatinine level 40% of sample creatinine level below 0.07mg/dl, 26.6% of sample creatinine level between 0.7-1.3 mg/dl and 33.33% of sample creatinine level above 1.3mg/dl. In Urea level 50% of sample urea level below 6 mg/dl, 23.3% of sample urea level between 6.0-24 mg/dl and 26.67% of sample urea level above 26 mg/dl. The table shows that 40% of sodium level below 135 mEq/L, 30 % of sample sodium level between 135 mEq/L-145 mEq/L and 30 % of sample sodium level above 145 mEq/L. The table represents that Potassium level 46.67 % of sample potassium level below 3.6 mmol/L, 20 % of sample potassium level between 3.6 mmol/L -5.2 mmol/L and 30 % of sample potassium level above 5.2 mmol/L. The frequency of Haemoglobin levelwas 30 % of sample haemoglobin below 13.2 gm/dl in male were 11.6 gm/dl in female, 33.33 % of sample haemoglobin level between 13.2-16.6 gm/dl in male or 11.6-15 gm/dl in female and 36.67 % of sample haemoglobin level above 16.6 gm/dl in male or above 15 gm/dl in female.

Post Test frequency and percentage distribution of various physical and biophysical parameters of a group of individuals undergoing hemodialysis. The parameters include blood pressure, body mass index (BMI), degree of edema, creatinine level, urea level, sodium level, potassium level, and hemoglobin level. Regarding blood pressure, the majority of individuals (43.33%) had hypotension, while 30% had prehypertension. No one had stage II hypertension. In BMI, the largest proportion of individuals (43.33%) had a BMI in the range of 25-29.9, which is classified as overweight. 30% of individuals had a BMI below 18.5, indicating being underweight. The degree of edema was classified on a scale of 0 to 4+, with 0 being no edema and 4+ being severe edema. The largest proportion of individuals (53.33%) had no edema, while 16.67% had 3+ edema.

For creatinine level, the ranges are <0.7mg/dL, 0.7-1.3 mg/dL, and >1.3 mg/dL. The percentage of patients falling in these ranges were 30%, 36.67%, and 36.67% respectively. Similarly, for urea level, the ranges are <6, 6-24 mg/dl, and >24 mg/dL. The percentage of patients falling in these ranges is 30%, 33.33%, and 40% respectively. For sodium level, the ranges are <135 mEq/L, 135-145 mEq/L, and >145 mEq/L. The percentage of patients falling in these ranges is 60%, 26.67%, and 16.67% respectively. Regarding potassium level, the ranges are <3.6 mmol/L, 3.6-5.2 mmol/L, and >5.2 mmol/L. The percentage of patients falling in these ranges is 50%, 23.33%, and 30%

respectively. For hemoglobin level, the ranges vary for males and females. For males, the ranges are <13.2 gm/dl, 13.2-16.6 gm/dl, and >16.6 gm/dl. For females, the ranges are <11.6 gm/dl, 11.6-15 gm/dl, and >15 gm/dl. The percentage of patients falling in these ranges is 36.67%, 40%, and 26.67% respectively.

DISCUSSION

The goal of the current research was to evaluate the impact of educational intervention on patients receiving hemodialysis knowledge of fluid and dietary conformance on a subset of physical and biophysical parameters. These results were similar to the study done by Isarannavar SG., 1 which found that 66.6% of dialysis patients had average knowledge and 53% patients had a good attitude towards their dietary management.[13] A study done by K. Srinivassan,2 had contradictory findings that 66.66% of patients had moderate knowledge, 20% had good knowledge and 13.33% had poor knowledge about dietary management for chronic renal failure. There was significant association between level of knowledge on dietary management with their selected demographic variables like age (15.74), gender (10.07), type of family (12), religion (16.82), and education (23.44).The data identified from the present study shows that majority of patients (40%) was hypotensive and 36.6% of patients had BMI below 18.5. As regard to degree of edema majority of patients (26.67%) had no edema. Majority of 40% of patients creatinine level below 0.07mg/dl, and 50 % patients urea level was normal. As regard to sodium level 40% of Patients hyponatremia and 46.67 % had hypokalaemia. Haemoglobin level majority of patients (36.67) % of patients haemoglobin level above 16.6 gm/dl in male or above 15 gm/dl in female. The majority of the patients group receiving hemodialysis had hypotension plus a low BMI, according to the current study, which is in line with other studies.[14] (Saran R, Bragg-Gresham JL 2003). Hemodialysis often results in hypotension, which is linked to higher morbidity and death rates. (Manns BJ, Taub K 2005) In hemodialysis patients, low BMI is also linked to higher death and morbidity rates. (A. J, Foley 2013).[15]

CONCLUSION

It was concluded that patients receiving hemodialysis had modest to moderate awareness of fluid and dietary conformance, and that the nursing interventions were successful in raising knowledge among those receiving hemodialysis.

Conflict of Interest: The authors certify that they have no involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this paper.

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References:

1. Samparpan Kidney Institute and Research Centre, Bhopal, India and Department of Nephrology, Postgraduate Institute of Medical Education and Research, Chandigarh, India
2. Combe C, Deforges-Lasseur C, Caix J, Pommereau A, Marot D, Aparicio M: Compliance and effects of nutritional treatment on progression and metabolic disorders of chronic renal failure. Nephrol Dial Transplant 1993;8: 412–418.

3. Saran R, Bragg-Gresham JL, Rayner HC, Goodkin DA, Keen ML, Van Dijk PC, Kurokawa K, Piera L, Saito A, Fukuhara S, et al: Nonadherence in hemodialysis: associations with mortality, hospitalization, and practice patterns in the DOPPS. Kidney Int 2003; 64:254–262.
4. Manns BJ, Taub K, Vanderstraeten C, Jones H, Mills C, Visser M, McLaughlin K: The impact of education on chronic kidney disease patients' plans to initiate dialysis with selfcare dialysis: a randomized trial. Kidney Int 2005; 68:1777–1783.
5. Collins, A. J., Foley, R. N., Herzog, C., Chavers, B., Gilbertson, D., Herzog, C., Ishani, A., Johansen, K., Kasiske, B., Kutner, N., Liu, J., St Peter, W., Ding, S., Guo, H., Kats, A., Lamb, K., Li, S., Li, S., Roberts, T., Skeans, M., … Agodoa, L. (2013). US Renal Data System 2012 Annual Data Report. *American journal of kidney diseases: the official journal of the National Kidney Foundation*, *61*(1 Suppl 1), A7–e476. https://doi.org/10.1053/j.ajkd.2012.11.031
6. Hill-Briggs F. (2003). Problem solving in diabetes self-management: a model of chronic illness self-management behavior. *Annals of behavioral medicine: a publication of the Society of Behavioral Medicine*, *25*(3), 182–193. https://doi.org/10.1207/S15324796ABM2503_04
7. Krespi, R., Bone, M., Ahmad, R., Worthington, B., & Salmon, P. (2004). Haemodialysis patients' beliefs about renal failure and its treatment. *Patient education and counseling*, *53*(2), 189–196. https://doi.org/10.1016/S0738-3991(03)00147-2
8. K. Srinivassan. A descriptive study to assess the knowledge on dietary management among chronic renal failure patients undergoing hemodialysis at selected Hospital, Kanchipuram, Int J Nur Edu Res. 2014; 2(3): 241–4p.
9. Nephrology Nursing Journal. 2015; 42(6):539. Daniels G, Robinson JR, Walker C, Pennings JS, Anderson ST. Gastrointestinal symptoms among African Americans undergoing hemodialysis. Nephrology Nursing Journal. 2015; 42(6):539.
10. Vesani CM, Trolonge S, Deléaval P et al.. Physical activity and energy expenditure in haemodialysis patients: an international survey. Nephrol Dial Transplant 2012; 27: 2430–2434
11. Tudor-Locke T, Washington C, Hart TL. Expected values for steps/day in special populations. Prev Med 2009; 49: 3
12. Elias MA, Van Damme W, Wouters E. Accessibility and quality of haemodialysis services in an urban setting in South India: a qualitative multiperspective study. BMJ open. 2022 Feb 1;12(2):e052525.http://dx.doi.org/10.1136/bmjopen-2021-052525
13. Valsa Jose J, Susan George J, Joseph R, Arun Thomas ET, Philip John G. Out-of-pocket expenditures, catastrophic household finances, and quality of life among hemodialysis patients in Kerala, India. Hemodialysis International. 2022 Oct;26(4):569-74.https://doi.org/10.1111/hdi.13037
14. Naik G, Ligade V, Prasad S, Guddattu V, Sreedhar D. Healthcare schemes for Hemodialysis patients in India: An Overview and Utilization in selected hospitals. Research Journal of Pharmacy and Technology. 2022 Oct 1;15(10):4382-8. 10.52711/0974-360X.2022.00735
15. Iyengar A, Ashok JM, Vasudevan A. Subjective global nutritional assessment [SGNA] in children on chronic dialysis-a prospective observational study. Indian Journal of Nephrology. 2022 Jul;32(4):334.10.4103/ijn.ijn_340_21