

Research Article

Perceptions of hemodialysis patients about fluid intake in Bahri Hemodialysis Center (Bahri Hospital), Khartoum North

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Abstract: Background: Hemodialysis requires significant patient involvement in a complex and demanding medical regimen. Self-care behavior includes adherence to prescribed medications, caring for vascular access, and importantly, the daily management of dietary and fluid intake. This cross-sectional center - based study was conducted in Bahri Hemodialysis Center during the period from December 2016 to February 2017. **The objective** of this study was to assess the perception of fluid intake among patients undergoing hemodialysis. **Methodology:** To carry out the study, a total of 80 hemodialysis patients were selected by using convenience sampling (non-probability sampling method), for those patients who were available during the period of data collection and willing to participate in the present study. Data was collected using closed ended questionnaire was filled by the researcher face to face with patients attended the center. **Results** of the study revealed that, 52.5% of the patients had their information about fluid intake from the doctors and 61.3% of them were advised to consume 1000 ml of fluids per day. The results revealed that, 56.2% of patients suffered from controlling fluids restriction. A significant relationship was found between patients' education levels and the importance of limiting fluid intake P value = (<0.001), and significant relationship was detected between complications of excessive fluid intake among patients and methods of controlling thirst among the patients P value = (<0.0001). The result also was demonstrated, significant relationship between advice on fluid restriction and patients' fluid consumption (<0.0001). The study concluded that, the knowledge of HD patients about the importance of fluid restriction and contacting with the medical staff had a positive effect to keep their health status and prevent any complication in regard to excessive fluids intake. Therefore, the study recommended that, Ministry of health should develop guidelines for the medical team that will help them to improve practices and proper deal with HD patients in renal centers toward fluid instructions and HD patients should always consult nutritionists or dieticians about fluid intake and the difficulties that faces them.

Keywords: Hemodialysis.**BACKGROUND:**

Chronic kidney disease (CKD) is a permanent and progressive loss of kidney function which results in the deterioration of renal function or end-stage renal disease. End-stage renal disease (ESRD) represents the end of the continuum of CKD. It is a devastating medical, social and economic problem for the patients, their families, and the country as a whole (Olugbenga *et al.*, 2010). CKD is an important component of chronic non-communicable disease (NCDs) that are now of pandemic proportions and are the major cause of morbidity and mortality worldwide (Ali *et al.*, 2011). The incidence and prevalence of CKD have increased in recent years in both developed and developing countries

including Sub-Saharan Africa (Hosseinpanah, 2009). According to the Global Burden of Disease study 2010, chronic kidney disease was ranked 27th in the list of causes of the total number of deaths worldwide in 1990, but rose to 18th in 2010 (Jha. *et al.*, 2013).

End-stage renal failure (ESRF) in Sudan is a serious health problem. It affects both sexes and all ages. In Sudan in Alribat university hospital at Khartoum State, Mohammed (2015) conducted a research to assess the nutritional status of patients undergoing hemodialysis in this hospital. He found that the incidence of new cases of chronic kidney disease patients were at the range of 100-170 per million

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inhabitants/year. Many efforts are needed to control over the causes of the condition kidney failure (Gabbad *et al.*, 2015). Low intake of energy and protein was reported by many researchers. Therefore good nutrition, and health education are recommended for patients, co-patients and families to overcome the risk resulted from CKD. Moreover, sufficient fluids, suitable food items are required to fulfill the recommended intake for CKD patients undergoing hemodialysis (Mohammed, 2015). In addition to, the International standard protocol of fluid management has a main role in the maintenance of the health status of hemodialysis (HD) patients and it is recommended to be applied among the Sudanese HD patients (Banaga, *et al.*, (2015).

Advice on the restriction of fluid intake is a corner stone of management of patients with kidney failure (Elsharif, 2009) , as renal disease progresses, the patient that placed on HD ultimately loses the ability to produce and excretes urine, therefore the amount of the fluid consumed must be regulated. The intake of 1000 ml per day of fluids is recommended to maintain the fluid balance and replace insensible water losses in the oliguric patient (Mahan and Escott-Stump, 2016). Fluids are any liquid at room temperature or melts at room temperature (Swafford, 2016). The fluid requirement for adults for renal diseases based on HD is 750 – 1000 ml/day + urine output (Mahan and Escott-Stump, 2008).

Problem Statement:

Generally, when Chronic Kidney Disease (CKD) progresses on to the dialysis process, continuous supply with a balanced diet plays a vital role in a patient's rehabilitation care. A well-balanced diet is necessary for them to stay fit as their kidneys are no longer functioning at its full capacity, i.e. get rid of the waste products and fluid from blood. It is essential for dialysis patients to have the right amount of protein, calories, fluids, vitamins and minerals each day (Elsharif, 2009). Without control of diet and fluid intake, the patients with HD can face a lot of complications such as hypotensive episodes, muscular cramps, itching, arrhythmias, and anaphylactic responses during the sessions. They also often develop immune-suppression, infections and bacteremia due to various interventions. Finally, a high percentage of hospital admissions occur due to vascular access dysfunction (Wilkins, *et al.*, 2012).

Fluid restrictions are usually necessary when dialysis is initiated, especially if dialysis only occurs three days a week and the urine production is decreased. Fluid restrictions vary for each individual. Factors that play a role in determining the amount of the restriction include weight gain between treatments, urine output, and swelling (Wilkins, *et al.*, 2012).

Justification of the Study:

The importance of nutritional evaluation and diet therapy in the overall management of the patients with chronic renal disease is unquestioned. It is thought to play a major role in the preservation of renal function and overall well-being in the renal patients. Hemodialysis gets rid of excess fluid and waste products in the body, but it is not effective as healthy kidney. Based on the researchers' experience, it was observed that several patients on hemodialysis did not comply enough on the safe diet or the suitable amount of fluid which definitely play as a major factor in the developing of many complications e.g. the increase of their daily suffering by affecting their activity of daily living negatively, circulatory burden, pulmonary problems and the increase of the cardiac workload as well (Mahan and Escott-Stump, 2016). There is limited information about patients' fluid intake undergoing hemodialysis in Sudanese hospitals or centers, Few data available concerning recommended fluid intake or diet recommended for the patients undergoing hemodialysis in Sudanese studies, most researches conducted were focusing on the prevalence and risk factors of the kidney disease thus it was worth to study the perception of fluids intake among patients undergoing hemodialysis.

Objective of the Study:

To assess knowledge, attitudes and practices of fluid intake among patients undergoing Hemodialysis in Bahri hemodialysis center (Bahri Hospital) at Khartoum north.

METHODOLOGY:

Cross-sectional health center based study was conducted in Bahri hemodialysis (HD) center in(Bahri Hospital) at Khartoum north, The center were selected randomly, the study population was patients undergoing HD during the period of the study (December 2016 to February 2017). The sample size was selected by using a convenience sampling, all patients attended the centers during the period of the study were included. The total number of the patients interviewed was 80.

Results:

Table 1. Patients' Age.

Age group	No of participants	%
20-30	7	8.75
31-40	10	12.5
41-50	30	37.5
>50	33	41.25
Total	80	100

Table (1) shows that, 8.75% of the patients between the age group of (20-30)years old,12.5% between the age group of (31-40)years old ,37.5% between the age group of (41-50)years old and 41.25% of the patients' age group were more than 50 years old.

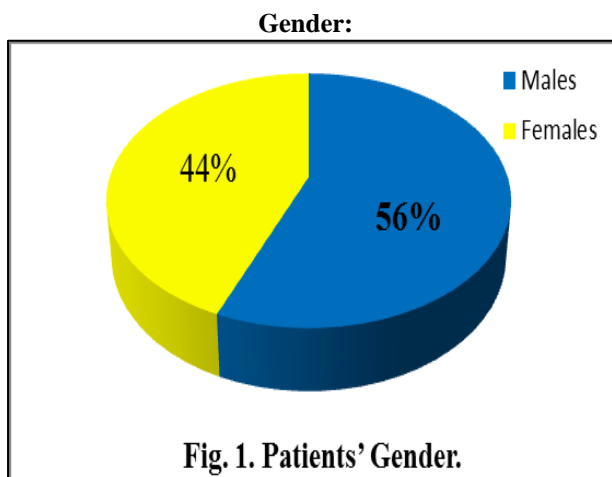


Figure (1) demonstrates that, (56%) of the patients were males while (44%) of them were females.

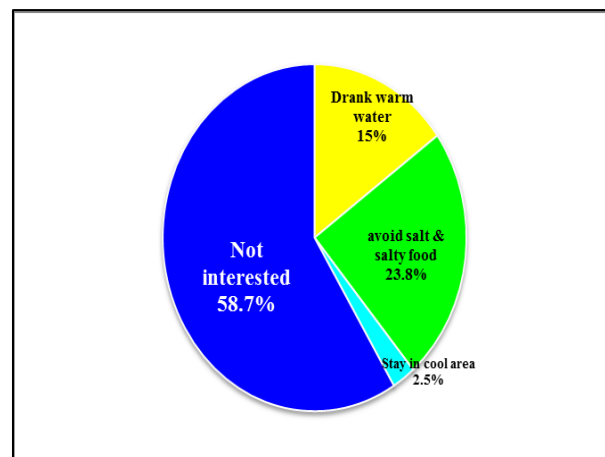


Figure (2), to control thirst, figure 2 shows that, 23.8 % avoid salt & salty food, 15% drank worm water, 2.5% stay in cool areas while 58.7% did not interest in controlling thirst.

Methods of controlling thirst:

Table (2). Source of information about fluid restriction, advice of fluid intake and the reasons behind limiting intake of fluids.

Source of information on fluid restriction	Source of information	Frequency	Percentage %
	Doctor	42	52.5%
Dietitian	27	33.7%	
Relatives	11	13.8%	
Total	80	100%	
Advice of fluids intake/day	Frequency	Percentage %	
	500 ml	17	21.2%
	750 ml	14	17.5%
	1000 ml	49	61.3%
	Total	80	100%
Reason behind limiting intake of fluids	Frequency	Percentage %	
	Kidney condition	19	23.7%
	To keep the body healthy	22	27.5%
	Instruction of medical professionals	25	31.2%
	Get sick after excessive fluids	5	6.3%
	Not interested	9	11.3%
Total	80	100	

With respects to the source of information about fluid restriction among patients, findings reveals that 52.5% of the patients took their information from their doctors, 33.7% of them answered that the source was dietitian and 13.8% of them answered that it was from their relatives. Also result reveals that, 61.3% of patients were advised to consume 1000 ml of fluids per day, 17.5% of them advised to take 750 ml of fluids / day and 21.2% of them were advised to consume 500 ml of fluids/ day. The reasons behind the limiting of fluids

intake among patients were differ according to their answers. More than third (31.2 %) of the interviewers answered that the reason was due to the instruction of medical professional, 27.5 % of them answered that it was to keep their body healthy, 23.7 % of them answered that because it was of the kidney condition, 6.3 % of them they answered that because they get sick after excessive intake of fluids and 11.3 % of them answered that they were not interesting to know the reasons behind the limiting of the fluids intake.

Table (3) Relationship between patients' education level and the importance of limiting fluid.

Education level	Importance of fluid restriction				Total
	Highly important	Very important	Moderately important	Less important	
Illiterate	4	6	10	1	21
	19.04%	28.6%	47.6%	4.8%	100%
Primary	2	5	6	0	13
	15.4%	38.5%	36.15%	.0%	100%
Secondary	5	7	4	0	16
	31.3%	43.8%	25.0%	.0%	100%
University	12	10	3	0	25
	48.0%	40.0%	12.0%	.0%	100%
Post graduate	2	2	1	0	5
	40.0%	40.0%	20.0%	0%	6.3%
Total	25	30	24	1	80
	31.3%	37.5%	30.0%	1.3%	100.0%

P=<0.001

Table (4). Relationship between patients' information source and the importance of fluid restriction.

Source of information on fluid restriction	Importance of limiting fluid to HD patients				Total
	Highly important	Very important	Moderately important	Less important	
Doctor	13	16	12	1	42
	31%	38 %	28.6%	2.4%	99.9%
Dietitian	9	13	5	0	27
	33.3%	48.2%	18.5%	.0%	99.9%
Relatives	3	1	7	0	11
	27.3%	9.1%	63.6%	.0%	100%
Total	25	30	24	1	80
	31.2%	37.5%	30.0%	1.3%	100.0%

P = 0.32

Significant relationship was detected between patients' education level and the importance of fluid restriction (P value = 0.001) (Table 3). While no significant

relationship was found between the patients' source of information and their importance of fluid restriction (Table 4) P value = (0.32).

Table (5). Complications of excessive fluid intake among the patients.

Expose to any complications	Answers		Frequency	%
	Yes	No		
			31	38.8%
			49	61.2%
	Total		80	100%
Types of complications	Complications			
	High blood pressure		7	22.6%
	Sudden drop of the blood pressure		10	32.3%
	Fluid in lungs		14	45.1%
	Total		31	100%

Table (5) shows (61.2%) of participants did not expose to any complication during the HD period while (38.8%) exposed to complications of intake of excessive fluids. Regarding the type of complications

occurred by taking excessive fluid intake, (22.6%) of patients faced high blood pressure and (32.3%) were affected by a sudden drop of blood pressure while 45.1% had fluid in their lung

Table (6) Relationship between complications of excessive fluid intake among Patients and methods of controlling thirst.

Expose to excessive fluid intake complication	Warm water	Method of controlling thirst			Total
		Avoid salt & salty food	Stay in cool area	Not interest	
Expose	2	2	0	27	31
	6.5%	6.5%	0.0%	87 %	100%
Not expose	10	17	2	20	49
	20%	35%	4.0%	41%	100%
Total	12	19	2	47	80
	15.0%	23.8%	2.5%	58.7%	100.0%

P value =<0.0001

Different methods were followed by patients to control thirst. Findings exhibited that 58.7 % of the patients were not interested to follow any methods of controlling thirst, 23.8% of them avoid salt and salty foods, 15% of them drunk warm water and 2.5% preferred to stay in cool area. Generally, significant relationship was detected between the exposing to complications of excessive fluid intake among patients and methods of controlling thirst among them (Table 6) where P values = <0.0001.

Table (7) Relation between advice on fluid restriction and patients' fluid consumption

Advice on fluid restriction	Fluids consumed L/day			Total
	<1	1	2	
500ml	7	10	0	17
	41.2%	58.8%	0.0%	100%
750ml	10	4	0	14
	71.4%	28.6%	0.0%	100%
1000ml	0	42	7	49
	0.0%	85.7%	14.3%	100%
Total	17	56	7	80
	21.3%	70.0%	8.7%	100.0%

P value =<0.0001

With regards to the patients' practices on fluid intake, result shows that, (70 %)of the patients consumed one liter of fluids during a day, while 8.7 % of them consumed two litters/ day. However, the result demonstrates, a significant relationship between advice on fluid intake and consumption of fluid by the patients / day, P value = <0.0001.

Table (8) Difficulties of controlling fluid restriction that faced patients.

Suffering from difficulties to control fluid	Answers	Frequency	%
	Suffering from difficulties to control fluid	Yes	45
No		35	43.8%
Total		80	100%
Types of difficulties	Difficulties		%
	Not interested	19	42.2%
	Unable to control	20	44.5%
	Don't understand	6	13.3%
Total		45	100%
Degree of difficulties	Degree		%
	Little	28	62.2%
	Moderate	16	35.6%
	A lot of difficult	1	2.2%
Total		45	100%

Generally, result reveals that 56.2% of the patients suffered from controlling fluids difficulties, while 43.8% of them did not face any difficulties on fluid control. Control of difficulties that faced patients was varied according to their answers, where 42.2 % of them did not interest to control fluid difficulties and 44.5 % of them unable to control fluid difficulties and 13.3 % of them did not understand the fluids restriction instructions. Regarding the degree of difficulties, 65.2%) of the patients faced little difficulties, 35.6 % of them faced moderate difficulties and only 2.2% of them faced a lot of difficulties (Table 8).

Table (9) Patients' times to contact with medical staff:

Times to contact the medical staff	No	%
Every month	6	8%
When abnormal test results	25	31%
Rarely	5	6%
Irregularly	39	49%
Never	5	6%
Total	80	100

Table (9) shows that, 49% of patients contacted the medical staff irregularly, 31% when had abnormal test results, 8% every month, 6% rarely contact medical staff while (6%) of them never contact medical staff.

DISCUSSION:

This study was designed to them investigate about the perception of fluid intake among patients undergoing hemodialysis in Bahri center (Bahri hospital) at Khartoum north. Sample was chosen by convenience sampling methods (non-probability sampling method). Despite that convenience sampling technique is discouraged due to inability to generalize research findings and the relevance of bias and high sampling error, but convenience sampling is easiest, facilitated data collection in such short duration of time and may be the only option available in certain situations in health center. Data was collected by closed ended questionnaire was filled by the researcher face to face with patients attended the center. Findings of the present study showed that 41.25% of the patients' age was above 50 years and the 56% of them were males. As for the education levels, 36.2% the patients received low to middle level of education, 37.5% of them had university education and post graduate studies education while the illiteracy level among them was high which represents 26.3%. Federal Ministry of Health (2011) found that (80%) of the Sudanese communities received low to middle level of education. This illiteracy rate and low to middle education level among the patients in this study is a sign of lack of healthy information and knowledge about the disease and its complications. Therefore health education, forums about this disease and its complications and other diseases are recommended to be conducted among citizens to raise their awareness and knowledge about CKD and its complications. Moreover, these programs are necessary to help them or their relatives if they are suffering from this disease or any another disease. The result demonstrated that more than half of the patients received their information about the fluid intake from their doctors. Generally, most of the patients were advised to consume 1000 ml of fluid per day. According to Mahan and Escott-Stump (2016) the fluid requirements for adults with renal diseases based on hemodialysis was in the range of 750 – 1000 ml/day + urine output. There was a variation in the consumption of fluid intake among the patients/ day; this may be

attributed to the advice provided by the health professionals depending on their patient conditions. A strong significant relationship was also found between the medical professional advice on limiting the fluid intake and the amount of the liters consumed by the patients during a day P value = (<0.0001), Mersal *et al.*, (2016) found that patients acquired statistically significant higher mean attitude scores when compared to the control group after implementation of the nursing guidelines and advice, they indicated that the study group had positive attitude toward diet and fluid regimen. The result showed that patients in the present study had different reasons of the importance of the fluids restriction. Patients with CKD who did not interest in limiting fluid intake may face many problems and complications. Excessive fluid intake by patients with chronic renal failure causes a lot of complications which may lead to death. A similar study conducted by Palmer *et al.*, (2015) who stated that an excessive of fluid intake can increase the morbidity and mortality in stage 5 of CKD patients. A significant relationship was detected between education level and the importance of limiting fluid intake (P= 0.001). It was observed that, 50 % of the patients who had university education and post graduates studies thought that fluid restriction was highly important. This is may be because they have more information about the importance of fluid restriction. Generally, more than half (58.7%) of the patients in this study did not interest in controlling of the thirst while 41.3 % of them preferred to control the thirst either by avoiding intake of high concentration of salt and salty foods or drinking warm water or staying in a cool area. Managing thirst without exceeding HD patients' daily fluid allowance is very important to control excessive fluid intake. Limiting sodium and effectively managing glucose level are the most important ways of controlling thirst, but there are also many helpful hints patients can use (McIntyre, 2015). The result revealed that, 49% of the patients did not expose to any complications during the HD period while 31% of them exposed to the complications of excessive intake of fluids. The types of complications detected among patients in this study were breath shortness and sudden drop of blood. A similar results obtained by Elamin *et al.*, (2012) who reported that the excessive intake of water among patients with chronic kidney failure was detected, in addition to this, lack of knowledge and awareness about the requirement of fluid intake during dialysis considered as the major cause of fluid overload and it lead to serious complications that affected negatively the patients' health status. Different methods were followed by patients to control thirst. Finding exhibits that 58.7 % of the patients did not interest to follow any methods of controlling thirst, 23.8% of them avoid salt and salty foods, 15% of them drunk warm water and 2.5% preferred to stay in cool area. Sodium restriction is one of the most effective and important ways to limit fluid-related weight gain between dialysis sessions Excess fluid intake without an associated sodium intake

does not cause hypertension, as it increases intracellular rather than extracellular volume. Therefore, although fluid restriction is the most common advice given by caregivers, sodium intake is also an important factor to consider (Ahmad, 2004). Significant relationship was detected between complications of excessive intake of fluid and methods of controlling thirst where P value = (0.0001). However, (87%) of the patients who exposed to the complications from the excessive fluid intake did not interest in controlling of thirst. According to a study conducted by Wei-Feng *et al.*, (2013) who indicated that there was a possible role of oral dryness to explain higher fluid intake between HD sessions. The use of saliva stimuli or saliva substitutes was shown to be effective in the reducing feelings of a dry mouth. This might also diminish the urge to drink in HD patients, enhancing compliance to the fluid-restricted diet and leading to a decreased high inter dialytic weight gain, (IDWG) and fewer systemic complications. Concerning the importance of fluid restriction, 56.2% of the patients suffered from controlling fluids difficulties. With regards to the types and degree of difficulties, results claimed that 44.5% of patients were unable to control fluid intake and only 2.2% of them faced a lot of difficulties, comparable results noted in a study done by Niraj *et al.*, (2018) stated that 69% of hemodialysis patients had troubles with maintaining the prescribed fluid balance. The medical professionals had a role to decrease these difficulties which was reflected by times to contact them; however 31% of the patients contact medical staff when there was abnormal test results, while 49% of them irregularly contact the medical staff, only 8% contact the medical staff every month. Kawaguchi (2013) stated that many health care providers and researchers believe that more frequent and longer patient-doctor contact (PDC) in HD care may improve patient outcomes because it provides physicians with greater opportunity to monitor treatments; enhance communication and build trust with the patient; and detect, prevent, and treat new medical problems. Previous study from the United States showed that less frequent PDC was associated with lower patient satisfaction, lower patient adherence, lower patient achievement of clinical performance targets, and higher hospitalization, but more frequent PDC was not necessarily related to longer patient survival (Slinin *et al.*, 2012). therefore, contact with doctors and dietitians or other related health cadres reduce the complications that may arise among the patients during before or after dialyses.

Conclusion and Recommendations:

The study concluded that there was a significant relationship between the HD patients' education levels and their attitudes and practices of fluid restriction. Moreover, the medical professionals did not interest to contact with their HD patients regularly, which had a negative impact on knowledge of the patients toward the control on fluid intake. The study recommended that HD patients should always

consult nutritionists or dieticians about fluid intake and the difficulties that faced them.

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