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MANAGEMENT OF HEMODIALYSIS UNIT FOR CARE RECEIVERS IN A SPECIALIZED HOSPITAL

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ABSTRACT

The aim of the study was to assess the management status of hemodialysis unit for care receivers in a specialized hospital. It was a descriptive cross sectional study. We used purposive sampling method, 83 participants were selected. Study setting was National Institute of Kidney Diseases and Urology (NIKDU) hospital, Dhaka. We used semi structured questionnaire, observational checklist and Face to face interview for data collection. The study findings were among the service receiver, mean age was 46.65±13.53 years of which (69.9%) were male and monthly income Tk. 20670±14811. Doctor performed the vascular access procedure and nurse took care of the access and dialyzer reuse facility. In the support services unit, equipment and stationery were supplied always, but medicine and investigation facility were Sometimes and Patient-doctor ratio was 1:15 and Patient-nurse ratio 1:6. Respondents (45.8%) said that, doctor/ nurse visit them thrice per cycle. In majority of respondents, were satisfied regarding the unit including doctors and nurses activities, physical facilities, and cleanliness of the unit, except the cleanliness of toilet. Increasing number of functioning dialysis machine, skilled manpower, medicine supply and strict infection control measure could be helpful to improve the management status of the hemodialysis unit of NIKDU.

Keywords: Dialysis, Hemodialysis, Chronic kidney disease (CKD), End-stage renal disease (ESRD), Reuse of dialyzers, Service facilities.

I. INTRODUCTION

The burden of Chronic Kidney Disease (CKD) is increasing in alarming proportion all over the world. In Bangladesh due to lack of financial resources, lack of trained manpower & infrastructure leads to severe strain on existing health policies in the light of the increasing burden of CKD. Kidneys are probably the only vital organs which can be realistically replaced by artificial means. Maintenance dialysis is a well-recognized modality of treating patients having end stage renal disease. Several thousands of patients all over the world are surviving and achieving reasonable quality of life on maintenance dialysis. The exact burden of CKD needing maintenance dialysis and/ or renal transplantation is not known; however, from the existing published data prevalence of CKD ranges between 0.7% to 1.4%. Whereas the incidence of end stage renal disease was estimated to be 180 to 200 per million populations.[1]

Diabetes is the main cause of kidney failure in most countries, accounting for 40% or more of new patients.[2] Prevalence of CKD seems to be increasing particularly in older individuals[3]. Hemodialysis is the mainstay therapy which is offered for ESRD patients who cannot undergo renal transplantation. Situation of Bangladesh is not different. A central issue in the management of patients undergoing maintenance hemodialysis (HD) is the assessment of the adequacy of dialysis[4]. Despite its dramatic success at saving lives, HD remains far from perfect therapy. More than 20% of hemodialysis patients die each year [5]. In developed countries usually hemodialysis is done thrice a week. However in India only 20% of patients are dialyzed 3 times a week[6]. Although it is well-known that increasing the frequency of dialysis improves the quality of life but it is a difficult option due to pressure from too many patients and inadequate hemodialysis machines.

About 85% of the world populations live in less developed part of the world where CKD prevention programs are either rudimentary or virtually non-existent[7]. Morbidities and mortalities emanating from CKD in these countries are immense and related to limited access for treatment options[8]. Renal replacement therapy (RRT) is the mainstay of care for patients with end stage renal disease (ESRD). Dialysis as an option of RRT prolongs survival, reduces morbidities and improves quality of life. However, despite many technical advances,

morbidities and mortalities of patients on dialysis remain unacceptably high and their quality of life is often poor[9]. Common independent predictors of survival are age, race, serum albumin at the start of dialysis, activity level at the start of dialysis, and presence of certain comorbidities such as heart failure and cancer[10].

World over there is severe shortage of donor kidneys. In our country deceased donor transplantation Programme is as yet in its infancy and because of breaking up of joint family structure the live donor programme is not enough for the needs of ESRD patients. Therefore several thousands of patients have to live on maintenance dialysis in Bangladesh. Maintenance dialysis importantly serves as a bridge to kidney transplantation. Our descriptive cross sectional study was aim to assess the management status of hemodialysis unit for care receivers in a specialized hospital.

II. METHODOLOGY

The study is a descriptive type of cross sectional study. The study was carried in hemodialysis unit of National Institute of Kidney Disease and Urology (NIKDU), Dhaka. The total study period was 1st January, 2016 to 31st December, 2016. Study Population was Health care receivers of hemodialysis unit. Purposive sampling technique was done, Sample size 83. Semi-structured interviewer administered questionnaire was developed to collect the data. The questionnaire was prepared by using the selected variables according to objectives A Semi-structured interviewer administered questionnaire was developed to collect the data. The questionnaire was prepared by using the selected variables according to objectives. Data were collected from respondents by face to face interview and an observational. The questionnaire was pretested in Dhaka. Necessary modifications were done and finalized before collection of data. For collection of data, both questionnaire and checklist were used. First part of the questionnaire included personal information of the respondents. Second part of the questionnaire contained questions to assess the clinical and nursing services, support services. Checklist was used to collect information regarding administrative facility, physical facility and utility services. The investigator himself collected data from the selected hospitals. Data were collected by face to face interview. Check list was filled up after observing the unit all through the data collection period. This study was conducted with the intention of protecting the human rights of all subjects. All the information collected for the study was utilized only for the purpose of thesis and was not disclosed to anyone outside the research team. At the beginning, approval was obtained from the ethical committee of NIPSOM, under the Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh. Before collection of data, written permission was taken from the director of the corresponding hospital and also informed written consent was obtained from participants after informing about the purpose of the study. A complete assurance was given that all information keeps confidentially. Inclusion criteria include willing to participate in the study and taking treatment facility for at least one week. Exclusion criteria include mentally retarded patients and severely ill patients.

III. RESULTS

After completion of the data analysis, the results were organized in the tabular form as necessary respectively. The tables are described as follows:

Table 1: Socio-demographic status of the health care receivers (n=83).

Age of the respondents	**Frequency**	**Percentage**
Up to 30 years	20	24.1
31-40 years	8	9.6
41-50 years	20	24.1
Above 50 years	35	42.2
Gender		
Male	58	69.9
Female	25	30.1
Educational qualification		
Illiterate	7	8.4
Primary passed	22	26.5
SSC passed	42	50.6
HSC passed	8	9.6
Above HSC	4	4.9
Occupation		
Not involved in any job	61	73.5

Service holder	7	8.4
Business	9	10.8
Others	6	7.2
Monthly family income (in taka)		
Up to 15000 taka	38	45.7
16000-30000 taka	31	37.3
31000-45000 taka	6	7.3
Up to 15000 taka	8	9.7

Above table shows the mean age of the health care receiver was 46.65±13.53 years. Among them 42.2% respondents were from above 50 years age group. Among the respondents 69.9% respondents were male and 30.1% were female. Educational qualification shows that among the respondents 26.5% were primary passed, 50.6% were SSC passed, 9.6% were HSC passed and 4.9% were above HSC. Occupation shows that 73.5% respondents were not involved in any job, 8.4% were service holder, 10.8% were business and others occupation were 7.2%. The mean monthly income of the health care providers was 20670.34±14811.53 taka. Among them 45.7% respondents had monthly income up to 15000 taka.

Table 2: Vascular access and reuse dialyzer facility of the unit

Vascular access	**Criteria**
Vascular access facility	Available
Type of vascular access	Femoral catheter and jugular catheter
Personnel involved in performing vascular access	Doctor
Personnel involved in taking care of vascular access	Nurse
Dialyzer	**Criteria**
Facility to reuse dialyzer	Available
Materials used to wash dialyzer	Formalin and hydrogen per oxide

Above table shows that the vascular access facility was present. In the unit, done only femoral catheter and jugular catheter or access. Doctor performed the vascular access procedure and nurse took care of the access and dialyzer reuse facility was also present. Formalin and hydrogen per oxide were used to wash dialyzer.

Table 3: Utility and support services of the unit

Utility services	**Criteria**
Linen is changed for every patient	Not always
Dietary service for patients	Absent
All accumulated waste materials are removed	Daily
Frequency of cleaning the unit	Daily
Twenty four hour security services	Absent
Support services	**Criteria**
All the necessary equipment's are supplied to patients from the hospital	Always
All the necessary medicines are supplied to patients from the hospital	Sometimes
Necessary investigation facilities are available in the hospital	Sometimes
All the necessary stationeries are supplied from the hospital to the unit	Always

Above table shows in the unit, linen was not always changed for every patient. Dietary service for patients were absent, all accumulated waste materials were removed daily and frequency of cleaning the unit were done daily and twenty four hour security services were absent. In the support services unit, equipment and stationery were supplied always. But medicine and investigation facility were Sometimes.

Table 4: Distribution of personnel and ratio of health care receiver and provider in the unit

Personnel	Number
Physician for dialysis patient	4
Nurse	15
Technician	5
Word boy	4
Total	28
Patient : Health care provider	**Criteria**
Patient-doctor ratio	1:15
Patient-nurse ratio	1: 6

Above table shows the total number of personnel in hemodialysis unit. In hemodialysis unit, there are 28 personnel in total. Among them, no. of physician for dialysis patient is 4 and no. of nurses for dialysis patient is 15, no of technician were 5 and word boy 4. Ratio of health care receiver and provider in the unit was Patient-doctor ratio 1:15 and Patient-nurse ratio 1:6.

Table 5: Distribution of clinical and nursing service related information of the health care receiver (n=83)

Clinical and nursing service	Frequency	Percentage
No. of time doctor/ nurse visit the patient		
2 times	11	13.3
3 times	38	45.8
More than 3 times	34	40.9

Above table shows the distribution of clinical and nursing service related information of the health care receiver. According to 38 (45.8%) respondents, doctor/ nurse visit them thrice per cycle, among them 34 (40.9%) respondents, doctor/ nurse visit more than 3 times per cycle, and 11(13%) respondents, doctor/ nurse visit 2 times per cycle.

Table 6: Patient's satisfaction regarding the unit (n=83)

Patient's satisfaction regarding the unit	Frequency	Percentage
Satisfied with doctor's activity		
Satisfied	61	73.5
Not satisfied	22	26.5
Satisfied with nurses' activity		
Satisfied	59	71.1
Not satisfied	24	28.9
Satisfied with physical facilities		
Satisfied	57	68.7
Not satisfied	26	31.3
Satisfied with cleanliness of the unit		
Satisfied	63	75.9
Not satisfied	20	24.1
Satisfied with cleanliness of the toilet		
Satisfied	20	24.1
Not satisfied	63	75.9

Above table shows the patient's satisfaction regarding the unit. In majority of respondents, were satisfied regarding the unit including doctors and nurses activities, physical facilities, and cleanliness of the unit, except the cleanliness of toilet.

IV. DISCUSSION

Dialysis is the treatment that artificially performs the function of the kidneys removing the wastes, salt and extra fluids from the blood. There are two different modalities of dialysis, hemodialysis and peritoneal dialysis. Hemodialysis uses a machine to accomplish the dialysis treatment, and it can be performed in hospitals, special dialysis centers, doctors have to create an access or entrance into the blood vessels of the patient in order to be able to connect the patient to the dialysis machine and a special filter called dialyzer or artificial kidney.

The utility service of the unit was observed. It was found that, in the unit, linen was not always changed for every patient. All accumulated waste materials were removed daily. Twenty four hour security services were absent.

There were three shifts in the unit. As more patients came in morning shift, more health care provider worked in morning shift. But in night shift, less number of health care provider worked as less patients came at night shift. On an average, the nurse patient ratio was 6:1 and the doctor patient ratio was 16:1.

Chronic hemodialysis patients are at high risk for infection because the process of hemodialysis requires vascular access for prolonged periods. In an environment where multiple patients receive dialysis concurrently, repeated opportunities exist for person to person transmission of infectious agents, directly or indirectly via contaminated devices, equipment and supplies, environmental surfaces, or hand of personnel. Furthermore, hemodialysis patients are immunosuppressed which increases their susceptibility to infection, and they require frequent hospitalization and surgery, which increase their opportunities for exposure to nosocomial infections[11].

In the unit, vascular access facility was present. Doctor performed the vascular access procedure and nurse took care of the access. During dialysis, the patient, the dialyzers and the dialysate both required constant monitoring because numerous complications are possible, including clotting of the circuit, air embolism, inadequate or excessive ultrafiltration (hypotension, cramping and vomiting),blood leaks, contamination and access complications. The nurses in the dialysis unit have an important role in monitoring, supporting, assessing and education the patient[12].

In the hemodialysis unit of NIKDU, dialyzer reuse facility was present. Formalin and hydrogen per oxide were used to wash dialyzer. According to the respondent's statement, 45.8% respondents said that doctor/ nurse visit them at least three times. 40.9% respondents said that doctor/ nurse visit them more than three times.

Majority of the health care provider (76.5%, n=13) were unsatisfied with the services of the CSSD department of the unit. The socio-demographic status of the health care receiver was also revealed in the current study. It was found that the mean age of the health care providers was 46.65±13.53 years. Among them 42.2% respondents were from above 50 years age group. Among the respondents 69.9% respondents were male.

A study conducted at Nephrology unit of Dhaka Medical College Hospital (DMCH) to see the association between epidemiological pattern of renal insufficiency with socio demographic factors, kidney related factors and others factors where they found patients suffering from CKD with male and female ratio being 1.5:1, mean age of the population was 47 years (SD ± 14.5)[13].

In this study revealed that most of the respondents (90.3%, n=75) did dialysis twice per week. Majority of the respondents (61.4%, n=51) did dialysis for 1- 2 years.

A study found mean time on dialysis was 2 to 11 year[14]. The dissimilarity of the result might be due to the fact that (Suri et al) had done a meta-analysis where they include the patients of developed country where the survival rate of CKD is more than developing country.

In the present study patient's satisfaction regarding the unit were assessed. In majority of cases, patients were satisfied regarding the unit except the cleanliness of toilet. 75.9% (n=63) respondents were dissatisfied with the cleaning status of the unit.

V. CONCLUSION

CKD is becoming a major public health problem worldwide. Hemodialysis is the ultimate treatment of CKD in developing country like Bangladesh. NIKDU is the only Institute for Nephrology & Urology in Bangladesh and provides education, research & treatment facilities for nephrology & urological diseases. From the current study it was found that the hemodialysis unit is well located. But the functioning dialysis machine and medicine supply was inadequate to meet the huge patient load. There was no vaccination for facilities for health care provider and receivers. Increasing number of functioning dialysis machine, skilled manpower, medicine supply and strict infection control measure could be helpful to improve the management status of the hemodialysis unit of NIKDU.

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