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Quality of Nursing Care for patients Undergoing Hemodialysisat selected units in Khartoum State

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Abstract:
Background
Quality is the degree to which performance meets expectations. quality health care is defined as "safe, effective, patient-centered, timely, efficient and equitable." the Agency for Healthcare Research and Quality (AHRQ) defines quality health care "as doing the right thing for the right patient, at the right time, in the right way to achieve the best possible results." (Roy Steiner 2017). Over the time, there has been a recent change in the world's disease profile and chronic diseases are currently becoming the primary reason of morbidity and mortality in the world, among which chronic kidney disease (CKD), has recently an increased prevalence in Sub-Saharan Africa (SSA), has been identified as one of the chronic diseases with public health problem. (Samuel B, 2018) quality of nursing care for hemodialysis patients should follow the standards of care, which are considered as a preliminary for better and excellent practice. (Saleh, Manal, 2018).
Aim: *The aim of the study was to evaluate the quality of nursing care provided for end-stage renal disease patients on maintenance hemodialysis.*
Methods: *The study was conducted in the capital state of Sudan, Khartoum at selected four governmental tertiary hospitals and centers provide such services. Study design: facility-based cross-sectional descriptive study design was conducted on ESRD patients undergoing maintenance hemodialysis care. The data was collected in four selected dialysis units using an equation method applied for a quantitative approach to determine sample size in the period from March 2016 to August 2017.*
Participants: *A total of 237 patients reserving care in the hemodialysis units. The primary outcome was patients' satisfaction with the overall hemodialysis care and secondary outcomes of the individual aspects of hemodialysis patient experience with the nursing care.*
Data collection and analysis procedure: *Data was achieved through (1) Structured Patient Satisfaction Scale pre-tested questionnaire based on the 5- Likert's scale for in-depth direct interview of the patients. The Scale comprised numerous dimensions of satisfaction related to accessibility and convenience, direct nursing care and safe environment, communication, and health education. And (2) a procedure checklist for the nursing care provided to assess the (pre. Intra, and post dialectic nursing care). Data analyzed according to the objectives using the SPSS program, a descriptive statistics analysis was undertaken.*
Result: *A total of 237 participants were responded with response rate 100% from whom 59(24.9%) were in the age group (56-65) years, and 158 (67%) were male. The overall satisfaction level was (65.2%). According to the checklist evaluating the nursing care provided for hemodialysis patients finding, all patients were kindly received, 237(100%), hand washing procedure did not performed before 180(75.9%) of the procedures, Nutritional assessment was done for 63 (32.3%) only, dialysis access sites were properly secured for 223 (94.1%) of the cases, Hemodynamic status assessment was not done complete for, 129 (66.2%) of the patients and 206 (86.9%) of the procedures were done by aseptic technique.*
Conclusion and Recommendation: *The level of participants' satisfaction with the care provided in hemodialysis units was (65.2%). This reveals that the level of patients' satisfaction is lacking and the recommended healthcare settings should monitor the relationship between nursing care and patients' experience to maintain quality care provision.*
Keywords: *Quality of care, End-stage renal disease (ESRD), Maintenance Hemodialysis (MHD), Satisfaction.*

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I. Introduction

Quality has come to be a progressively main part of human been lives. The patient is constantly looking for quality care services [(1)]. Quality in health services comprises practical (clinical) excellence and functional (non-practical) quality. From which the previous is emphases on the abilities, correctness of processes and medicinal judgment whereas the last denotes to the method that health facilities are delivered to the patients [(2)]. In nursing care of hemodialysis patients, quality is a complex concept that has multiple perspectives including the technical and personal aspects furthermore it should be conforming to standards of care, which are considered as a preliminary point for improved practice. Without specified standards, judgments made in the evaluation process may be variable, subjective, and susceptible to the fads and biases of the evaluators [(3)]. The prompt rise in the rate of chronic kidney disease and individuals demanding renal replacement therapy was noticed. Dealing with these patients needs a collaboration of health team. Specialized nurses in the nephrology field have an energetic role in favorable delivery of the maximum excellence of care in a profitable way [(4)].

Quality healthcare is persistently appreciating the patient by providing effective and efficient services pertaining to the most up-to-date clinical guidelines and standards, which meet the patient's needs and satisfy health professionals. Accordingly, healthcare services should have the capability to meet the prospects of both the patient and the healthcare personnel [(5)]. "The standards of professional nursing practice are authoritative statements of the duties that all registered nurses, despite of role, a level of care or performance, values, and priorities, population or specialty be classified and are expected to perform competently" by which the quality of nursing practice can be judged [(6)]. Standards can be formulated according to frames of references (used for setting and evaluating nursing care services) relating to nursing structure, process, and outcome because standard is a descriptive statement of the desired level of performance against which to evaluate the quality as possible what is up to standard and what is not acceptable [(7)].

The Standards of Practice describe a competent level of nursing care as demonstrated by the critical thinking model known as the nursing process, which includes the nursing assessment, diagnosis, outcomes identification, planning, implementation, and evaluation. Accordingly, the nursing process encompasses significant actions taken by registered nurses and forms the foundation of the nurse's decision-making [(6)].

Thus, the standards of performance describe a competent level of behavior in the professional role including activities related to ethics, culturally congruent practice, communication, collaboration, leadership, education, evidence-based practice and research, quality of practice, professional practice evaluation, resource utilization, and environmental health. All registered nurses are expected to engage in professional role activities, including leadership, appropriate to their education and position. Registered nurses are accountable for their professional actions to themselves, their healthcare consumers, their peers, and ultimately to society [(6, 8)].

Chronic kidney disease is a mounting health problem worldwide leading to a large population of end-stage renal disease (ESRD) patients for whom the only treatment is renal replacement therapy (RRT) [(9)]. The process of removing waste products and excess fluid from the body is known as Dialysis. This is necessitated when the kidneys are not able to adequately filter the blood and allows patients with kidney failure a chance to live productive lives. Two types of dialysis are available; hemodialysis and peritoneal dialysis. Each type has advantages and disadvantages. Patients can usually choose the type of long-term dialysis that best matches their needs, mostly hemodialysis. Hemodialysis has a major influence on the everyday life of patients and many patients report dissatisfaction with treatment [(10)].

Moreover, it has catastrophes complications that can be divided into complications related to hemodialysis equipment as; hemodialysis device, water system, Dialyzer, and vascular access-related complications among which infection is the most serious. Additionally, neurological complications and, anticoagulant therapy use linked problems. Furthermore, hematologic and, other complications such as nausea vomiting, itching, muscle cramps among which ([1)]. Infection is the main reason for hospitalization and, another extreme mutual cause of deaths amongst HD patients. "Infection control in dialysis units remains the most important measure to maintain a healthy environment and to prevent and avoid dissemination of infection among immunocompromised patients". HD patients are vulnerable to various kinds of contagions comprising bloodborne infections and confined infections of hemodialysis vascular access; as the deferent types of hepatitis (B, C virus) and, /or HIV virus; and airborne contaminations. Sources of infections include ([11)]. Nurses have an essential starring role in the care of patients who come to the health settings looking for help for such conditions, as they have adjacent and incessant contact with the patient, and the extreme duty falls on those professionals [(10)].

II. Methodology

The study was conducted at Khartoum State (capital of Sudan). The participants were patients with end-stage renal disease maintenance hemodialysis receiving care at hemodialysis units. The sample size enrolled in the study was 237 patients. The respondents' satisfaction with nursing care provided at the hemodialysis units

in selected hospitals in Khartoum State was assessed using a structured questionnaire based on the Likert scale. And a checklist was used to evaluate the nursing care provided. The sampling method used was the non-probability convenience sampling technique.

III. Results

The study involved 237 respondents among patients receiving hemodialysis services; at four HD unites in Khartoum State. The result showed the distribution of sample study according to demographic data, 11 (4.6%) were at age group of (18-25 years), whereas (23.6%), of the patients were in the age group (46-55) years. Nearly half of the population 101 (43.3%) resided in Omdurman city. According to gender, the majority of the study sample 156 (76%) were male and 77 (33%) were females with Mean± Std 30± 5.8, in regards to the educational status, illiterate, and primary (Basic) level accounted about 32 (13.7%) and 56 (24%) respectively whilst, the high secondary school level was the highest percentage 66 (28.3%). The majority of the participants 152 (65.2%) were married, and 119 (51.1) % were jobless or housewives, 23 (9.9%) were retired and, only 36(15.5%) were employed. Moreover, two-third of the study population were from low-income class accounted for about 156(66.9%), (Table 1). With regards to frequency of dialysis sessions, 215 (92.0%) were dialyzed two sessions per week (Figure1). And 115 (45.1%) had (4 years and more) duration in the unit (Figure 2).
In respect to the distribution of checklist according to elements of evaluation,in the dialysis phases

Per dialysis phase:

Per dialysis phase, adherence to the infection control guidelines were followed as, gowns and coats were warned only by 27(11.4 %) of the nursing staff, and not warned by 210(88.6%), hand washing procedure did not performed before 180(75.9%) of the procedures, and thepre-dialysis safety checks were performed on 79(40%) of the HD machines for functioning and alarms activity, by the nursing staff whilst, 116 (59%) was not applicable according to hospital policy it was done by the medical engineers. Nurses' approach towards the patients, all patients were kindly received, 237(100%), and 187(95.9%) of written physician's order for dialysis were checked, 67(34.4%) of patients' renal profile and other investigations were checked. About 124 (63.6%) of the clients were weighed, and the procedure explained to 68 (34.9%), of the patients, while patients' comfort was maintained for 123 (63.1%). Assessment for edema done on 111 (56.9%). Hemodynamic status assessment was not done complete, 129 (66.2%) of the patients were checked for (laying BP) only before initiation of HD secessions. Furthermore, psychological assessment and support were done for 95 (48.7%). Nutritional assessment done for 63 (32.3%), however, interdialytic history was taken for 51 (26.2%) only. Safe clean environment was maintained for 195(82.3%), and the necessary equipment was prepared for all patients 237(100%), as well as appropriate dialyzer sizes and dialysate concentrate, was selected for all 237(100%) Table (2).

Intradialytic Phase

Regarding the standard precautions, gloves were worn when dealing with 225 (94.9%) of the patients. Assessment, disinfectant, and puncture of the access site were all done completely. Furthermore, about 165 (69.6%) patients' vital signs were not completely monitored during dialysis phase for 57(24.1%) of the patients' Table (2).

Dialysis Termination phase:

Prior to the disconnection of the lines, hand hygiene was practiced on 47(24%) of the procedures only, and the personal protective measures were not completely worn, only gloves were donned when dealing with 214 (90.3%) of the patients. Regarding the tubes disconnection, 206 (86.9%) of the procedures were done by aseptic technique. Never the less 223 (94.1%) of the dialysis access sites were properly secured. Concerning the hemodynamic status evaluation of patients' post-dialysis, 232(97.9%) procedures were not complete. Previous brief Intradialytic history was not taken for 186(78.5%) because it was not applicable. Regarding medications as ordered 204 (86.1%), were administered of post-dialysis blood sample ordered for renal profile and other investigations were not applicable for 138(58.2%), dry weight was measured for 128 (54.0 %) and, 124 (63.6%) cases were well-documented Table (2).

According to patients' response to the nursing care provided, the overall satisfaction was low 65.2%. According to patients' satisfaction with elements of satisfaction and the findings showed no satisfaction for accessibility and convenience 40.1%, high satisfaction for communication 80.1%, low for satisfaction for health education 65.1%, moderate satisfaction for nursing care 75.8% and, neutral response 51.2% for the physical environment Table (3)

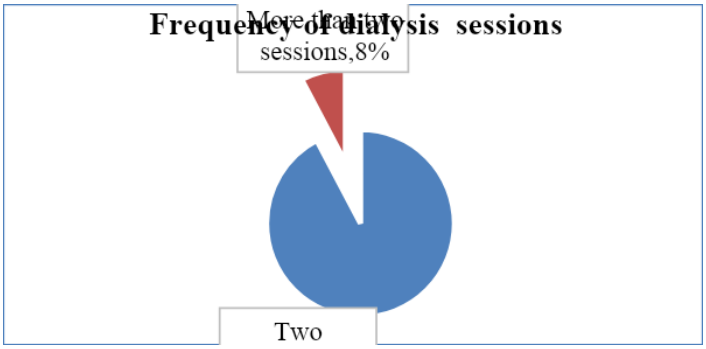

Figure (1): Distribution of study sample according to (Frequency of dialysis sessions per week) (n=237)

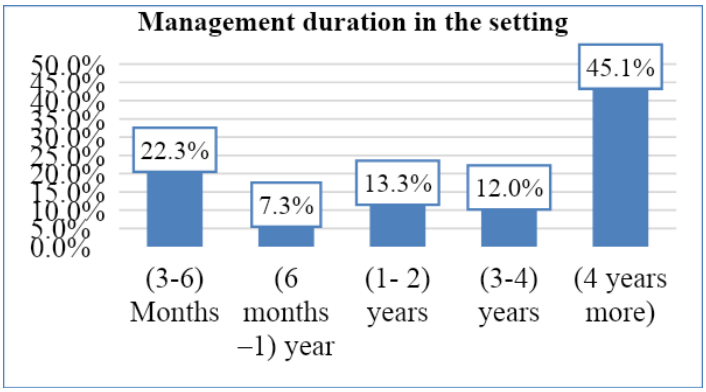

Figure (2): Distribution of study sample according to (Management duration in the setting) (n=237)

Table (1): Distribution of the study population according to Demographic data

		Frequency	Percent
Age	**(18-25) years**	11	4.3%
	(26-35)years	39	16.3%
	(36-45) years	42	17.6%
	(46-55) years	46	19.3%
	(56-65) years	59	24.9%
	66 years and more	41	17.6%
Residence	**Khartoum localities**	86	36.1%
	Omdurman localities	102	43.3%
	Khartoum Bahary localities	39	16.3%
	Other states	10	4.3%
Gender	**Male**	159	67.0%
	Female	78	33.0%
Educational level	**Illiterate**	33	13.9%
	Primary School	57	24.0%
	Secondary School	20	8.6%
	High Secondary School	67	28.3%
	Graduate	52	21.9%
	Post graduate	8	3.4%
Social status	**Single**	68	28.8%
	Married	155	65.2%
	Widow	7	3.0%
	Divorced	7	3.0%
	Employee	36	15.5%
	Self-employer	57	23.6%
	House wife/ unemployed	121	51.1%

Employment	**Retired**	23	9.9%
Family income	**Low (≤1500 SG)/m**	156	66.0%
	Moderate (1500-≤3000 SG)/m	76	32.0%
	High (≥ 3000 SG)/m	5	2.0%

Table (2): Distribution of the checklist according to elements of evaluation

No.	Elements of evaluation of	Done		Not Done
	Per dialysis phase	**Completely**	**Not Completely**	
1.	Wear gown or lab coat	27(11.4 %)	0 (0.0%)	210(88.6%)
2.	Check the dialysis machine for function and alarms activity.	121(51.1 %)	116(48.9%)	0(0.00%)
3.	Perform hand washing.	57(24.1%)	0(0.0%)	180(75.9%)
4.	Receive patient kindly.	237(100 %)	0(0.0%)	0(0.00%)
5.	Check written physician's order to identify the patient and the instructions for HD.	217(91.6%)	0(0.0%)	20(8.4%)
6.	Measure pre dialysis patient's body weight.	124(52.3%)	113(47.7%)	0(0.00%)
7.	Well explain the procedure to the patient and the family	169(71.3%)	0(0.00%)	68(28.7%)
8.	Pre preparation (Instruct the patient to wash hands and clean access site (AVF or Graft)	0(0.0%)	20(8.4%)	217(91.6%)
9.	Maintain patients' comfort.	237(100.0%)	0(0.00%)	0(0.00%)
10.	Check hemodynamic status, BP (lying, sitting and standing), apical pulse, Resp. rate, and lung sound).	66(27.8%)	171(72.2%)	0(0.00%)
11.	Assess patient's psychological status and support.	95(40.1%)	100(42.2%)	42(17.7%)
12.	Assess the patient's nutritional status (nausea, anorexia, vomiting).	105(44.3%)	0(0.00%)	132(55.7%)
13.	Maintain a safe clean environment including the disinfection of the machine surface and the chair).	152(64.1%)	85(35.9%)	0(0.00%)
14.	Prepare necessary equipment, supplies (syringes, cannulas, normal saline, Erythropoietin, and Heparin).	237(100%)	0(0.00%)	0(0.00%)
15.	Select appropriate dialyzer and dialysate concentrate.	237(100%)	0(0.00%)	0(0.00%)
Intradialytic Phase				
16.	Follow standard precautions (wash hands)	68(28.7%)	0(0.00%)	169(71.3%)
17.	Follow standard precautions (don gloves).	225(94.9%)	0(0.00%)	12(5.1%)
18.	Maintain aseptic technique when setting-up and priming the Hemodialysis machine.	206(86.9%)	0(0.00%)	31(13.1%)
19.	Assess dialysis access the site for function (palpate for distal thrill, Auscultate for a bruit).	237(100%)	0 (0.00%)	0 (0.00%)
20.	Clean, disinfect and prepare the access site (Fistula, Shunt or Cannula) for puncture.	237 (100%)	0(0.00%)	0 (0.00%)
21.	Puncture access site gently (Fistula, Shunt or connecting to cannula), connect to the machine and initiating daily.	237 (100%)	0(0.00%)	0 (0.00%)
22.	Monitoring patient's vital signs (BP, HR, RR, and temperature).	72 (30.4%)	165(69.6%)	0(0.00%)
23.	Monitoring dialysis process.	188(79.3%)	49(20.7%)	0(0.00%)
24.	Monitoring the patient for dialysis tolerance and Intradialytic HD complications (clotting, bleeding, low & high BP, etc.	180(75.9%)	0(0.00%)	57(24.1%)
No.	**Elements of evaluation**	Done		Not done
	Post dialysis phase	Completely	Not Completely	
25.	Maintain infection control (handwashing).	47(19.8%)	0(0.00%)	190(80.2%)
26.	Follow standard precautions (Personal protective measures 'gown, gloves, mask).	0(0.00%)	214(90.3%)	23 (9.7%)
27.	Maintain aseptic technique when disconnecting tubes.	206(86.9%)	0(0.00%)	31(13.1%)
28.	Secure the dialysis access properly.	223(94.1%)	0(0.00%)	14(5.9%)
29.	Evaluate patient's hemodynamic status post dialysis.	5(2.1%)	232 (97.9%)	0(0.00%)
30.	Monitor dialysis access for bleeding and ensure patient's safety.	225(94.9%)	0(0.00%)	12 (5.1%)
31.	Care for dialysis machine (cleaning and sterilizing).	237(100.0%)	0(0.00%)	0 (0.0%)
32.	Disinfect HD chair or bed and rearrange equipment and the room.	95(40.0%)	0(0.00%)	142(60.0%)
33.	Perform hand hygiene post procedure.	129(54.4%)	0(0.00%)	108 (45.6%)
	Elements of evaluation	**Complete Done**	**Not applicable**	**Not Complete Done**
34.	Previous session (brief Intradialytic history).	51 (21.5%)	186(78.5%)	0(0.00%)
35.	Pre dialysis check of the patient's renal profile and other investigations.	109(46.0%)	128(54.0%)	0(0.00%)

36.	Pre preparation (Instruct the patient to wash hands and clean access site (AVF or Graft)	0(0.00%)	20(8.4%)	217(91.6%)
37.	Administer of medications as ordered. (Heparin, Erythropoietin, iron etc.…) during dialysis.	204(86.1%)	33(13.9%)	0(0.00%)
38.	Obtain blood sample as ordered post dialysis.	57(41.8%)	138(58.2%)	0(0.00%)
39.	Weight patient (dry weight) post dialysis.	128(54.0%)	109(46.0%)	0(0.00%)
40.	Document the procedure (pre, intra, and post dialysis).	124(63.6%)	0(0.00%)	71(36.4%)

Table (3): Distribution of sample study according to the overall satisfaction

Element	Overall satisfaction	Interpretation
Accessibility and convenience	**40.1%**	**Not Satisfied**
Communication	**80.1%**	**High Satisfied**
Health Education	**65.1%**	**Low Satisfied**
Direct Nursing Care	**75.8%**	**Moderate Satisfied**
The physical environment of the unit	**51.6%**	**Neutral**
The overall satisfaction	**65.2%**	**Low satisfaction**

IV. Discussion

Hemodialysis therapy is a chronic persistent and time-long management for patients. Health personals, academic researchers, and directors of hemodialysis treatment centers should be attentive to aspects associated with the delivery of hemodialysis therapy which are very important to patients. This also has an impact on adherence, which is a key factor for the success of treatment.

Concerning the socio-demographic characteristics of patients under study, the results revealed that most of the study samples (19.3%), and (24.9%), were in the age group of (46-55), and (56-65) years, respectively Figure1. This result comes in agreement with a study done in Qatar and found that (44.6%) were in the age group (65-74) years [(12)], another study result showed that the respondents were in the age group 61.0±15.5 years, [(13)]. Whereas two results are in contradiction with this study revealed that most of the study sample were within the age group of (18–35) years old [(14)], and 31(27.4%) of the clients were in the age group of 30-39 and18-29 years respectively [(15)]. The disease is attacking the productive age group thus affecting the socioeconomic status which in turn leads to the inability to access their management and better quality of life as well.

In respect to residence (43.3%) were from Om Durman city, which comes in agreement with a study done in India showed that 49(70%) of patients were residing in urban areas [(16)]. Om Durman city is the least city in hemodialysis services, patients are facing difficulties thus being the factor that affects the satisfaction of patients who immigrate several hours two days weekly for dialysis services in Khartoum city. In regard to gender, the result showed the majority of the respondents (67%) were male. This is similar to a study carried by [(17)] who revealed the majority of the study sample (61.8%) were males, in addition to a study done in Egypt, the sample had slightly more males (59.5%), also (67.3%) were male according to [(15,18)]. These findings expressed the effect of the disease on the income putting more stress on all family members, as most of the families depend on the males to run their daily living requirements as well as health expenditure.

Concerning the educational status, 66 (28.3%), were educated up to the high secondary level this is not in agreement with a result studied by [(12)] in which education was mostly basic (read and write) (48.1%) or primary (26.6%), and also with a study from Ethiopia that revealed that most of the study participants' educational level was college and above.

In regard to occupation, the result showed that most of the participants (51.1%) were jobless and housewives. This is in agreement with, 62.4% of patients were retired, 11.7% were unemployed, (7.3%) engaged in the household as showed by [(19)]. (50.1%) of the sample were unemployed, this donate patient's low satisfaction response due to their less opportunity to work, then the challenges as they can't afford to buy expensive, but necessary, medicines.

With respect to family income two-third of the study population 159 (66.9%), were from low-income class. Four studies of chronic kidney disease outcome have proved the reverse relationship between socio-economic status (SES) and chronic kidney disease, supporting a meaningful link between low income and kidney disease. Renal failure (RF) incidence/prevalenceis related to SESmoreover, a wide range of health indicators in patients undergoing dialysis. "Higher SES is related to lower depression and higher levels of activities of daily living in patients with ESKD and undergoing dialysis. The reasons why lower SES has a negative effect on health indicators in patients with ESKD and undergoing dialysis may involve fewer personal resources and lower levels of social support to deal with stress imposed by ESKD and dialysis" [(20)].

Finance is the most significant contributing factor that affects the personal, social and health-related factors of patients, revenue and currency are vital parameters disturbing QOL of kidney patients [(21)].

Relating to dialysis sessions (92%) of the respondents in the present study were receiving two sessions per week, here is a result showing dialysis adequacy enhances the patients' sense of health and brings satisfaction

to the nurses. When dialysis is poorly performed, the patients develop hypotension, cannot maintain their balanceand experience an impaired quality of life, a lot of patients were suffering and complain because they receive two sessions of dialysis per week. The ideal time of dialysis to remove the toxins and excess water is 12 hours per week that is to say 4 hours three days a week. [22]

With respect to the nursing care provided to HD patients, the current findings revealed that preparation of necessary equipment, supplies, and appropriate dialyzer and dialysate concentrate for all the patients 237(100%), this is similar to a study showed, that nursing technician who was in charge of preparing the machines programmed the solutions for each patient according to their medical prescription, session length, and losses of patients[11]. Patient safety is an international issue, which accomplished through checking the physician order to identify the patient, verify the appropriate dose, duration, and fluid concentration to avoid errors besides the preparation of appropriate equipment and other requirements to prevent complications of dialysis is an essential role of hemodialysis nursing.

Adherence to the universal precautions especially Hand hygiene is the core of nursing care to control hospital-acquired infection in this work hand hygiene is the major issue, it is not performed before 210 (90%) of the procedures and even after any action it is seldom done in almost all the hemodialysis units, this in covenant with a study reported that Nurses' commitment to infection control methods reduces disease and mortality[1].

also, hand cleanliness was continually preserved by the specialists, however, there was no code of behavior in the area for these measures and the practice of antimicrobials was not directed [11], another study presented the significance of hand hygiene in a table showing the estimated minimum number of times where hand hygiene is required per dialysis session per patient (regardless of glove use) is at least (30) times [10]. Infection is the main reason for hospitalization and another extreme mutual cause of deaths amongst HD patients. "Infection control in dialysis units remains the most important measure to maintain a healthy environment and to prevent and avoid dissemination of infection among immunocompromised patients". HD patients are vulnerable to various kinds of contagions comprising bloodborne infections and confined infections of hemodialysis vascular access; as the deferent types of hepatitis (B, C virus) and, /or HIV virus; and airborne contaminations. Sources of infections include [11], according to the CDC**,** the Principal action to control HD Bloodstream Infection (BSI) are "[1) Surveillance and feedback using NHSN, 2) Perform observations of hand hygiene opportunities monthly and share results with clinical staff, 3) Perform observations of vascular access care and catheter accessing quarterly, 4) Staff education and competency, 5) Provide standardized education to all patients on infection prevention topics including vascular access care, hand hygiene, risks related to catheter use, recognizing signs of infection, and instructions for access management when away from the dialysis unit, 6) Catheter reduction Incorporate. efforts to reduce and enhance permanent vascular access placement and 7)]" Use an alcohol-based chlorhexidine (>0.5%) solution as the first line skin antiseptic agent [23].

This result presented the overall satisfaction with care was (65.2%) equivalent to 3.21 on the Likert scale which was found to be higher than results that showed the overall proportion of participants satisfaction with the dialysis was (41.6%), another result conducted in Egypt showed findings 50% satisfied with the care provided in the dialysis unit, also reported that 47(67.1%) of maintenance hemodialysis patients were satisfied with the care [15, 16, 18]. Nevertheless, it is incongruent with a study finding with score lower than the present result showed with a study conducted in Savopoulos, Brazil 53 % and work conducted in Kenya at the renal unit of Kenyatta National hospital with findings 50% satisfied with the care provided in dialysis unit as stated by [19]. The current finding is high compared to the other studies despite the scarcity of resources, which needs improvement as this result highlights the significance of patients' opinions and awareness as main acting factors of healthcare provision.

In regards to patients' satisfaction with accessibility and convenience, (59.0%) rated as 2.95 on the Likert scale, the respondents were not satisfied. This came with a study performed in hemodialysis ward of Kowsar hospital in Semnan, in 2014, showed that access to human resources and their abilities were among the factors facilitating care. However, lack of qualified medical staff at each level of care delivery was one of the barriers to HD care. Hence, stated by [12]. Similarly (Teshome) mentioned that patients' satisfaction level with availability and accessibility of the service was (2.51, 0.745) [15]. Moreover, it was stated that the three main areas for improvement were: 1) car-parking, 2) practical support (e.g. cooking meals, etc.) and 3) having accessible locations (away from large hospitals; easier access for transport and parking) [24].

Access to resources is one of the essential elements of quality of services, inability to reach or inadequacy of resources for hemodialysis needed for the ideal required doses of dialysis three times per week is an experience that can greatly affect patients' satisfaction.

Related to communication domains, they were highly satisfied with nurses' Communication (80.1%) A study done by Karaka A. presented that nurses were less interested in explanations about their interventions

and communication with patients that did not meet their expectations [10]. On the other hand, nurses ought to understand patients, build trust and respond to their needs through encouragement [18]. Moreover, Atashzadeh and colleagues recognized that fulfilling the patients' requirements via communication, carefulness, and shared respect concerning the nurse and the patient as focused care [22] "As a profession, nursing predominately requires communicating with and relating to, patients at the individual level. In the hospital setting nurses undertake many of their patient-related duties in a face-to-face manner with the patient at the bedside and these moments can facilitate effective interaction to occur between the nurse and the patient, which is patient-centered. McCabe et al. state that patient-centered communication as "defined by Langewitz et al. as 'communication that invites and encourages the patient to participate and negotiate in decision-making regarding their own care" [19].

Moreover, the result was come in contrast with findings by Aguiar LL. et al who stated that the practice of communication had certain imperative gaps, that is to say, deficiency of involvement of nephrologist nurses and physicians in visitations for patients undertaking Services in outside areas and deprivation of adjustment when transferring data by telephone concerning the overall state and the medical state of patients to undertake HD procedure[11]. Communication is considered as the cornerstone of nurses' work which, affects clinical performance, with patients especially for those jeopardized clients on chronic renal dialysis.

Regarding health education, the respondents report low satisfaction (65.1%), the findings of a study done by Nobahar "the participants believed that training was an integral need for patients and the nurses asserted that, through providing basic training, the patients can carry on with their routine life and perform their daily chores without anyone's help"[22].

Health education is an essential element in patient management so educating patients who were in challenge with continuous fluids and dietary restriction have great value in the stabilization of patient condition on daily life and even control of ultrafiltration of fluids during dialysis to avoid complications. As education affects the patients' adherence to dialysis and medication regimen beside the infection control practice and access site protection. This is supported by a result [15]. The present result is lacking, nurses need to assess their patients' knowledge and provide comprehensive health education that benefits the customer.

Concerning the physical environment of the unit, the result presented that there is low participants' satisfaction with the issue of environment (51.6%) rated as (2.58) on the Likert scale. Especially with waiting place, temperature and lighting this is come with a study finding stated that "The limited space available in the dialysis department, poor hygiene, poor bed conditions, and worn-out mattresses, the shortage of linen, poor ventilation and limited audio-visual facilities were some of the factors that caused dissatisfaction with the facilities provided"[13]. Moreover, there was an agreement with a result showed that suitable milieu is critical to support patients' settlement with their continual attendance in the HD unit and the associated medical difficulties, hurting processes and practical dares. The quality of nursing care can be effects by environmental subthemes, as 'atmosphere of the working place', 'inadequacy and shortage of equipment needed for work', 'frustration with the resources and abilities of the setting' and 'low financial status'[22]. This matter reveals the nursing and human nursing imperative part invariance to the need for practical nursing and new specialized services ([25]. Hemodialysis is a lifelong continuous treatment for those patients spending about fours hour receiving care which creates stressful consequences for the patients as well as for the staff, good physical environment with adequate facilities can promote comfort for the patents and support working condition and increase quality of care thus, in turn, increase patients' satisfaction.

V. Conclusion:

This study revealed that the respondents had lower levels of satisfaction concerning health education, and the unit environmental; moreover, they showed moderate satisfaction toward the nursing care given in the dialysis unit. This needs extensive work to overcome the obstacles that led to this result in order to optimize the care for dialysis clients. Yet again this study finding exposed the most common causes of dissatisfaction were the accessibility and convenience, residence, and family income, health education, and unit environment. Focusing on these zones and improving its elements can lead to service quality and thus patients' satisfaction.

VI. Recommendations:

1. Nurses are critical to the delivery of high-quality, efficient care. Improving care abilities, including nurse's high educational level, and a safe environment will increase the quality of care and patients' satisfaction.
2. The Stakeholders and other concerned bodies should improve the accessibility of services, through increasing services including resources and materials needed for investigations, surgeries, dialysis, medications, and transportations.
3. Reducing patient waiting time to obtain healthcare services by increasing the proportion of health care providers and all others supports staff with the number of customers so as to make maximum utilization of their services and in turn to benefit the clients.

4. Great emphasize should be directed toward the client's reassurance, and the educational aspects at the hemodialysis unit by providing educational posters, guidelines, pamphlets, and manuals and it is provided modern educational nursing team at hemodialysis enhance health education.

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References

[1]. Manal S. Moustafa Saleh (1), Jehan Sayyed Ali (2) Walid M Afifi(3. Nurses Compliance to Standards of Nursing Care for Hemodialysis Patients : Educational and Training Intervention. J Nurs Heal Sci [Internet]. 2018;7(2):48–60. Available from: https://www.researchgate.net/profile/Manal_Saleh7/publication/330385129_Nurses_Compliance_to_Standards_of_Nursing_Care_for_Hemodialysis_Patients_Educational_and_Training_Intervention/links/5c3da7bd92851c22a375f49e/Nurses-Compliance-to-Standards-of-Nursing
[2]. Alhassan RK, Duku SO, Janssens W, Nketiah-Amponsah E, Spieker N, van Ostenberg P, et al. Comparison of perceived and technical healthcare quality in primary health facilities: implications for a sustainable National Health Insurance Scheme in Ghana. PLoS One. 2015;10(10):e0140109. Available from:https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0140109
[3]. Thomas A, Silver SA, Rathe A, Robinson P, Wald R, Bell CM, et al. Feasibility of a hemodialysis safety checklist for nurses and patients: A quality improvement study. Clin Kidney J [Internet]. 2016;9(3):335–42. Available from: https://watermark.silverchair.com/sfw019.pdf?token=AQECAHi208BE49Ooan9kkhW_Ercy7Dm3ZL_..pdf
[4]. Garvey TM, McCarron NM. of Kidney Diseases and Transplantation Editorial A Nursing Perspective of Caring for Patients with End-stage Renal Disease in Hospitals. 2018; 29(4):755–65. Available from: https://www.researchgate.net/publication/327203321_A_nursing_perspective_of_caring_for_patients_with_end-stage_renal_disease_in_hospitals/fulltext/5b8ae3bb299bfld5a737ea05/327203321_A_nursing_ prespective_of_caring_for_patients_with_end- stage_renal_disease_in_hospitals.pdf ?origin=
[5]. Isaac K Baidoo, Abeku A Asare-Kumi, Ezekiel NN Nortey* and Epaphras Baffoe Kodom
[6]. Available from: https://www.researchgate.net/profile/Abeku_Asarep-Kumi/publication/312499350_Profiling_Patients_Healthcare_Quality_Perceptions_A_Baseline_Study_of_the_University_of_Ghana_Hospital/links/587fa82408ae9a860ff7e1c7/Profiling-Patients-Healthcare-Quality-Perceptions-A-Baseline-Study-of-the-University-of-Ghana-Hospital.pdf
[7]. American Nurses Association. Nursing Scope and Standards of Practice, 3rd Edition 2015. 264 p. Available from: www.Nursingworld.org
[8]. Total Quality Management (TQM) in Nursing Care: Nursing management. open-access articles on nursing management. May 26, 2011; [Internet]. Available from: http://currentnursing.com/nursing_management/total_quality_management_health_care.html
[9]. Gecsedi R, Richard Henker R, Kirk Koyama F, Carla B Lee RA, Tonette McAndrew F, Verna Sitzer R, et al. American Nurses Association Recognition of a Nursing Specialty, Approval of a Specialty Nursing Scope of Practice Statement, Acknowledgment of Specialty Nursing Standards of Practice, and Affirmation of Focused Practice Competencies. 2017;(August):1–30. Available from: https://www.nursingworld.org/~4989de/globalassets/practiceandpolicy/scope-of-practice/3sc-booklet-final-2017-08-17.pdf
[10]. Tejada-Tayabas LM, Partida-Ponce KL, Hernández-Ibarra LE. Coordinated hospital-home care for kidney patients on hemodialysis from the perspective of nursing personnel. Rev Lat Am Enfermagem [Internet]. 2015;23(2):225–33. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4458995/pdf/0104-1169-rlae-23-02-00225.pdf
[11]. Sharon Lewis Linda Bucher Margaret Heitkemper Shannon Dirksen. Medica-Surgical nursing 10th,edition [Internet]. 2016. Available from: https://metronidazole.files.wordpress.com/2010/03/medical-surgical_nursing-10th-edition-by-brunner-suddarth.pdf
[12]. Aguiar LL, Vilani M, Guedes C, Oliveira RM, Maria I, De T, et al. Nursing and International Safety Goals: Hemodialysis Assessment Enfermagem E Metas Internacionais De Segurança: Avaliação Em Hemodiálise. Cogitare Enferm [Internet]. 2017;223(22). Available from: http://dx.doi.org/10.5380/ce.v22i3.45609
[13]. Rojas JN. Hemodialysis Patient Care in Renal Dialysis Unit among Selected Hospitals in the Sultanate of Oman. IOSR J Nurs Heal Sci. 2017;06(02):01–8. Available from:
[14]. https://pdfs.semanticscholar.org/d982/7e96b53770c5bba1655841f060ac0dbaa884.pdf
[15]. Palmer SC, Berardis G De, Craig JC, Tong A, Tonelli M, Pellegrini F, et al. Patient satisfaction with in-center hemodialysis care : an international survey. 2014;4(5):1–9. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4039823/pdf/bmjopen-2014-005020.pdf
[16]. Karaca A, Durna Z. Patient satisfaction with the quality of nursing care. Nurs Open. 2019;6(2):535–45. 41818e8d7a81381ba461629eea327e62f36c2400971b63cfb7fc0cc72b6da3c4
[17]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6419107/
[18]. Teshome Habte Wurjine1, * SKR 1Department. Assessment of Patients' Satisfaction with Care at Selected Governmental Dialysis Units in Addis Ababa, Ethiopia, 2018. Am J Nurs Sci [Internet]. 2018;7(6):202–9. Available from: http://article.sciencepublishinggroup.com/pdf/10.11648.j.ajns.20180706.11.pdf
[19]. Monika Sharma. Satisfaction With Care In Hemodialysis Unit Among Maintenance Hemodialysis (Mhd) Patients. 2018;08(6):21185–92. Available from: https://www.journalijdr.com/satisfaction-care-hemodialysis-unit-among-maintenance-hemodialysis-mhd-patients
[20]. Wanjiku H. an Evaluation of Perceptions on Maintenance Haemodialysis Services in a Resource-Limited Setting : a Quality of Care Survey. 2014; Available from https://pdfs.semanticscholar.org/6c2f/bfdf044d05088e3d2ce0d74cc8b9d36ac544.pdf
[21]. Bayoumi M, Guindy HA El, Ahmed A. Patients ' Satisfaction with Care at Dialysis Unit. Int J Nurs Sci. 2016;6(5):117–22. Available from: http://article.sapub.org/10.5923.j.nursing.20160605.02.html

[22]. Newell S, Jordan Z. The patient experience of patient-centered communication withnurses in the hospital setting: a qualitative systematic review protocol. JBI
[23]. Database Syst Rev Implement reports. 2015;13(1):76–87. Available from: https://www.ncbi.nlm.nih.gov/pubmed/26447009
[24]. Monika Sharma. Satisfaction With Care In Hemodialysis Unit Among Maintenance Hemodialysis (Mhd) Patients. 2018;08(6):21185–92. Available from: https://www.journalijdr.com/satisfaction-care-hemodialysis-unit-among-maintenance-hemodialysis-mhd-patients
[25]. Anees M, Batool S, Imtiaz M, Ibrahim M. Socio-economic factors affecting quality of life of hemodialysis patients and its effects on mortality. Pakistan J Med Sci. 2018;34(4):811–6. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6115583/pdf/PJMS-34-811.pdf
[26]. Nobahar M. Exploring experiences of the quality of nursing care among patients, nurses, caregivers and physicians in a hemodialysis department ORIGINAL RESEARCH EXPLORING EXPERIENCES OF THE QUALITY OF NURSING CARE AMONG PATIENTS, NURSES, CAREGIVERS, AND PHYSICIAN. 2018;(March 2017). Available from: https://onlinelibrary.wiley.com/doi/pdf/10.1111/jorc.12187
[27]. CDC Dialysis safety. CDC approach to BSI prevention in dialysis facilities. 2017;37(9):917–8.
[28]. Available from: https://www.cdc.gov/dialysis/pdfs/dialysis-core-interventions-5_10_13.pdf
[29]. Coleman S, Havas K, Ersham S, Stone C, Taylor B, Graham A,... Bonner A.
[30]. Patient satisfaction with nurse- led chronic kidney disease clinics: A multicentreevaluation. [Internet]. 2017; 43(1):11-20.Available from: https://eprints.qut.edu.au/101810/1/Patient%20satisfaction%20with%20nurse%20led%20clinics_Accepted.pdf
[31]. Shahidi H, Rahnama M. Experience of Nurses in Hemodialysis Care: A Phenomenological Study. J Clin Med. 2018;7(2):30. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5852446/pdf/jcm-07-00030.pdf

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