



“A study to assess the effectiveness of Protocol for connecting Haemodialysis on Chronic Kidney disease (CKD) patients among the staff nurses in Dialysis Unit, Narayana Medical College Hospital, Nellore”

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Abstract : *Kidney is one of the major vital organ in human body .Proper function of the urinary system is essential to filter and remove organic waste products from the blood. Dysfunction of the kidney may occur at any age with varying levels of severity. Renal failure is the severe impairment or total lack of kidney function. In renal failure there is an inability to excrete metabolic waste products and water as well as functional disturbance of all body systems. Renal failure is classified as acute or chronic. Chronic kidney disease is defined as evidence of kidney damage (proteinuria or hematuria) or structural renal abnormalities (polycystic kidney disease) and glomerular filtration rate (GRF) less than 60ml/min present for greater than 3 months. It is important to take care of vascular access to prevent complications in chronic renal failure with haemodialysis. CRF patients are more prone to develop complication related to infection, clotting, and rupture. Before starting haemodialysis, an important step is preparing a vascular access i.e. used to remove the patient's blood that it can be filtered through the dialyzer . It needs to be prepared either weeks or months before the actual procedure starts and able to deliver blood flow rates as high as 400 to 500ml/min through the dialyzer. OBJECTIVES: To assess the protocol for connecting haemodialysis on CKD patients among the staff nurses in dialysis unit.To prepare and implement the protocol for connecting haemodialysis to CKD patients in dialysis unit. To evaluate the effectiveness of protocol on connection of haemodialysis to CKD patients in dialysis unit. To find the association between effectiveness of protocol for haemodialysis to Chronic Kidney disease (CKD) patients among the dialysis staff nurses with their selected socio demographical variables.*

METHODOLOGY: *A quantitative research approach is used to assess the effectiveness protocol for connecting haemodialysis on CKD patients among staff in dialysis unit. The research design was pre experimental pre test post test research design. The study was conducted in Narayana medical hospital Nellore. 60 staff were selected by non probability convenience sampling technique. The demographic data was collected by interviewing the staff nurses. The pretest was done by using observational checklist to assess the knowledge of haemodialysis among staff nurses. The protocol for connecting haemodialysis was implemented to the staff nurses in dialysis unit. Post test was done after 21st day by using the same observational checklist to assess the effectiveness among the staff nurses in dialysis unit. RESULTS: Staff nurses during pre test, 27 (45%) had very good practice 33(55%) had good practice where as in post test 42(70%) had Excellent practice 18(30%) had very good practice. Comparison of mean and standard deviation of pretest and post test scores among staff nurses . During pretest mean is 39.66 with standard deviation 6.29. The post test mean is 67.91 with standard deviation 8.24. The calculated value of paired Z test is 10.02 and table value is of 5,24. The calculated value is greater than the tabulated value, so there is significance improvement in connecting haemodialysis on CKD patients among staff nurses. In staff nurses' pre test, there is significant association between selected socio demographic variables of staff nurses such as clinical experience and designation. In staff nurses post test there is significant association between selected socio demographic variables of staff nurses such as educational qualification, clinical experience and designation.*

Keywords: *Effectiveness, Protocol, Connecting Haemodialysis, Chronic kidney disease, CKD Patients.*



1. INTRODUCTION:

Kidney is one of the major vital organ in human body .Proper function of the urinary system is essential to filter and remove organic waste products from the blood.¹ Dysfunction of the kidney may occur at any age with varying levels of severity. Renal failure is the severe impairment or total lack of kidney function. Renal failure is an inability to excrete metabolic waste products and water as well as functional disturbance of all body systems. Renal failure is classified as acute or chronic. Chronic kidney disease is defined as evidence of kidney damage (Proteinuria or hematuria) or structural renal abnormalities (polycystic kidney disease) and glomerular filtration rate (GRF) less than 60ml/min present for greater than 3 months.² The World Health Report 2010 estimates that the diseases of the kidney and urinary tract contribute to over 8,50,000 deaths and over 15 million disability-adjusted life years³. Even this is considered an underestimate, due to problems of CKD classification and limited data on CKD from observational studies many developing countries including India or from personal experience of nephrologists. Much less is known about earlier stages of CKD when symptoms may be mild or neglected by patients or their caring physicians¹. CKD is the disease which glomerular filtration rate is less than 15ml/hr. It is the most devastating medical, social and economic problem for patients and their families. The estimated new cases of end stage of renal disease 100 per million people in a year globally, and 1 lakh patients from India. Most CKD patients reporting to tertiary care centers in India are in the final stage where renal replacement therapy (RRT) is the only option at this stage. In India 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. Several thousands of patients all over the world are surviving and achieving reasonable quality of life on maintenance of dialysis¹. Haemodialysis is a medical procedure that uses a dialyzer to clean the blood of toxins, uremic waste extra salt and fluids through a dialysis machine. It helps to maintain proper ions balance such as potassium, sodium chloride and bicarbonate and keeps blood pressure under control. Hence, it is proved that haemodialysis is a life saving procedure for renal failure patients³. It is important to take care of vascular access to prevent complications in chronic renal failure with haemodialysis. CRF patients are more prone to develop complication related to infection, clotting, and rupture. Before starting haemodialysis, an important step is preparing a vascular access i.e. used to remove the patient's blood that it can be filtered through the dialyzer. It needs to be prepared either weeks or months before the actual procedure starts and able to deliver blood flow rates as high as 400 to 500ml/min through the dialyzer¹. Shyam.C. stated that chronic kidney disease is the most problem in medical, social and economic problem for both patients and their families of our country. The approximate prevalence CKD disease of 800 per million populations and the frequency of end stage renal disease are 150-200 per million populations⁴.

1.1 NEED FOR THE STUDY :

Bohm M 2015 reported that the number of patients being treated for CKD globally was estimated to be 3,010,000 at the end of 2014 and with a 7% growth rate ,continues to increase at the significantly higher than the world population. of these 3,010,000 CKD patients, approximately 2,358,000 were undergoing dialysis treatment and around 652,000 people were living with kidney transplants⁵. In the 2015 Global burden of disease study, kidney disease was the 12th most common cause of death, accounting for 1.1 million deaths worldwide. Overall CKD mortality has increased by 31.7% over the last 10 years.

As per Indian council of Medical Research 2014, 40-60% cases of CKD are recorded under Diabetes and hypertension. Prevalence of diabetes in Indian adult population increase to 7.1%, (varying from 5.8% in Jharkhand to 13.5% in Chandigarh).In India, there are around 35,000 patients undergoing dialysis at different centers⁵. Mukhesh khanna 2013 has conducted a study about the burden of chronic kidney disease in India (Chennai, Delhi and Bhopal) .The study shows that, in Chennai; the prevalence at the community level is 8600 per million populations. The second study based in Delhi revealed a prevalence of chronic kidney disease of 7852 per million populations. The third study shows in Bhopal revealed that the incidence of 151 per million populations suffered from end stage renal disease⁶. In the Prakasam district of Andhra Pradesh, India (known as the Uddanam area), 2013 60% of the local population has been found to have CKD. Nearly 4000 people have died due to CKD, and one third of the population in Uddanam suffered from CKD. One possible link was the silica and heavy metals in groundwater. Then, water from Uddhanam region was tested by the Ground Water Department and Indian Council of Medical Research in 2013.The test has confirm that due to the excessive silica and heavy metal had happened the CKD⁷. In 2009, more than 3,70,000 patients were treated to maintain haemodialysis in the United States. Haemodialysis patients require a vascular access which can be catheter or a graft or enlarged blood vessel that can be punctured to remove and replace blood. They are high risk for infection with antimicrobial-resistant bacteria. Measuring and tracking rates of infection and utilizing is an important part of



prevention⁴. The National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (KDOQI) 2016 provided evidence-based guidelines for all stages of chronic kidney disease (CKD). In 2015 update of the KDOQI Clinical Practice Guideline for Hemodialysis Adequacy is intended to assist practitioners for caring patient's preparation during haemodialysis. The literature reviewed for this update includes clinical trials and observational studies published between 2000 and March 2014. New topics include high-frequency haemodialysis and risks; prescription flexibility in initiation timing, frequency, duration, and ultra filtration rate; and more emphasis on volume and blood pressure control. Appraisal of the quality of the evidence and the strength of recommendations followed the Grading of Recommendation Assessment, Development, and Evaluation (GRADE) ⁸. Barboutis NG 2012 conducted a study about an outbreak of haemodialysis catheter related bacteria with sepsis caused by Streptococcus in a haemodialysis unit. It was significantly associated with the presence of a haemodialysis catheter (p=0.028) and care for more than 30 mint by a specific nurse during the last during the last two haemodialysis sessions (p=0.0070). The study shows that group a B Streptococci strain was transmitted from one patient to the others through the hands of medical personal. The importance of strict infection control practices in haemodialysis units are depending on the practices who are working in dialysis unit⁹. Good quality of life and survival on maintenance dialysis depends on following major factors namely¹⁰;-

- i) The dose of dialysis delivered or solute removal achieved,
- ii) Time on dialysis,
- iii) Adequacy of nutrition,
- iv) Family and socio-economic support,
- v) Management of co-morbid illnesses and
- vi) Prevention & management of infections.

In our country the quality of dialysis delivered to patients can vary from centre to centre. The quality could range from very poor to as good as any centre in the world because there is no minimum defined standard of care of maintenance dialysis¹⁰. With the above mentioned articles and studies, investigator understood that the incidence and prevalence of CKD patients are increasing worldwide and haemodialysis is the way to expand their life, so investigator justified the need to improve the haemodialysis on the care of the clients with chronic failure undergoing haemodialysis¹¹.

2. OBJECTIVES:

- To assess the protocol for connecting haemodialysis on CKD patients among the staff nurses in dialysis unit.
- To prepare and implement the protocol for connecting haemodialysis to CKD patients in dialysis unit.
- To evaluate the effectiveness of protocol on the connection of haemodialysis to CKD patients in dialysis unit.
- To find the association between effectiveness of protocol for haemodialysis to Chronic Kidney disease (CKD) patients among dialysis staff nurses with their selected socio demographical variables.

2.1 RESEARCH HYPOTHESIS:

H₁:. There is a statistically significant effectiveness of protocol on connecting haemodialysis among dialysis staff nurses
H₂:. There is a statistically significant association with effectiveness of protocol and selected socio demographic variables.

2.2 CONCEPTUAL FRAMEWORK

The conceptual framework for this study was modified Roy's Adaptation Theory.

3. METHODOLOGY :

RESEARCH APPROACH:

A quantitative research approach was utilized the protocol for connecting haemodialysis on CKD patients among the staff nurses in dialysis unit, Narayana medical college hospital, Nellore.

RESEARCH DESIGN:

The research design reveals the study is Pre experimental one group pretest-post test research design



X: Intervention – protocol for connecting haemodialysis.

O₂: Post-test to determine the scores of connecting haemodialysis on CKD patients among staff nurses in dialysis unit.

**SETTING:**

The study was conducted in dialysis unit at Narayana Medical College Hospital, Nellore. The hospital comprise 1750 beds with all specialties and well equipped. It is located in 2nd floor superspeciality hospital with 20 beds and 20 dialysis machines and everyday minimum 55 patients and maximum 70 patients are getting admission for haemodialysis.

POPULATION :-**Target population:**

Staff nurses who are working in dialysis unit at Narayana Medical College Hospital.

SAMPLE:

The samples was staff nurses who are working in dialysis unit at Narayana Medical college Hospital units, Nellore and who fulfill the inclusion criteria

SAMPLING TECHNIQUE:

Non probability convenience sampling techniques was adopted to select the samples.

SAMPLE SIZE:

The sample size consist of 60 staff nurses in dialysis units, at Narayana Medical College Hospital, Nellore.

CRITERIA FOR SAMPLE SELECTION**INCLUSION CRITERIA:**

1. Staff nurses working in dialysis unit
2. Both male and female staff nurses
3. Who are willing to participate in the study.

EXCLUSIVE CRITERIA:

1. Who are not available during the study.
2. Staff nurses who have clinical experience less than 1 months
3. Staff nurses who are working in other wards.

VARIABLES:

- **Independent variables:-** protocol for connecting haemodialysis.
- **Dependent variables:-** Dialysis unit staff nurses.

DESCRIPTION OF THE TOOL:-

The tool consist of three parts

PART-I

Socio-demographic variables including age, gender, educational Qualification, clinical experience, marital status, designation and attended CNE programme related to haemodialysis.

PART-II

It consists of 3 parameter observational checklists with to assess the effectiveness of protocol for connecting haemodialysis on CKD patients are:-

- *Physiological parameter*
- *Haemodialysis catheter connection checklist*
- *Arteriovenous fistula cannulation checklist*

SCORE INTERPRETATION

Poor	-	1-20
Good	-	21 -40
Very Good	-	41-60
Excellent	-	61-80

PART-III INTERVENTION PROTOCOL

DAY	SESSION	PROCEDURE
Day-1	Session-1	Assess the protocol for connecting haemodialysis on CKD patients
Day 2-21	Session-2	Implement the protocol for connecting haemodialysis on CKD patients
21 st days	Session-3	Post test was conducted



CONTENT VALIDITY:

Content validity of the tool was obtained from the experts for their opinion and suggestions. The suggestions of the experts were included and the tool was modified before conducting the main study data collection.

RELIABILITY:-

The reliability of the tool was established by half split method by using the formula $=2r/1+r$ and r value obtained was 0.9. The stability of the test was confirmed by test and retest method.

ETHICAL CLEARANCE:

Ethical clearance was obtained from the Institutional Ethics committee of Narayana Medical College Hospital, Nellore.

4. DATA ANALYSIS AND INTERPRETATION:

The data obtained was analyzed based on the objectives of the study by using descriptive and inferential statistical methods

1. **Descriptive statistics:** Frequency and percentage, Mean and Standard deviation to analyze distribution of socio demographic variables.
2. **Inferential statistics:**
 - To assess the effectiveness of protocol for connecting haemodialysis on CKD patients among staff in dialysis unit.
 - To find out the association between effectiveness of protocol for haemodialysis on CKD among staff nurses in dialysis unit with their socio demographic variables.

DATA ANALYSIS:

Section I: Frequency and percentage distribution of socio demographic variables of staff nurses

Section II:-Frequency and percentage distribution of protocol for connecting haemodialysis among staff nurses

Section III: Effectiveness of protocol for connecting haemodialysis on CKD patients among staff nurses

Section IV: Comparison of mean and standard deviation of pre-test and post test scores for connecting haemodialysis among staff nurses

Section V: Association between protocol for connecting haemodialysis among staff with their socio demographic variables in staff nurses

SECTION-I: Frequency and percentage distribution of socio demographic variables of staff nurses in dialysis unit

Table 1: Frequency and percentage distribution of staff nurses based on demographic variables (n=60)

Demographic variables	f	%
Age in years		
a. 20-25 years	21	35
b. 26-30 years	37	62
c. 31-35 years	2	3
Gender		
a. Male	9	15
b. Female	51	85
Educational Qualification		
a. B.Sc(N)	35	58
b. Post B.Sc (N)	4	7
c. GNM	21	35
Clinical Experience.		
a. < 1year	7	12
b. 1-3 year	30	50
c. 4-5 year	23	38
Marital status		
a. Married	29	48
b. Unmarried	31	52



Designation		
a. In-charge	3	5
b. B.Sc Staff	35	58
c. GNM staff	22	37
Attended CNE programme related to dialysis.		
a. Yes	37	62
b. No	23	38

Table 1- Shows that with regard to age in staff nurses, 21(35%) were 20-25 years, 37 (62%) were 26-30 years, 2 (3%) were 31-35 years, with regard to gender in staff nurses, 9(15%) were males and female 51(85%), educational qualification in staff nurses, 35(58%) studied B.Sc(N),4(7%) studied post B.sc(N),and 21 (35%) studied GNM, regard to clinical experience in staff nurses, 7 (12%) were <1year, 30 (50%) were 1-3 year, 23 (38%) were 4-5 years, Regarding to marital status in staff nurses, 29 (48%) were married and 31 (52%) were unmarried, designation in staff nurses, 3 (5%) were In-charge, 35 (58%) were staff and 22 (37%) were GNM staff. And who has attended CNE programme related to dialysis in staff nurses 37 (62%) were attended CNE programme related to dialysis and 23 (38%) were not attended CNE programme related to dialysis.

SECTION II

TABLE 2:- Frequency and percentage distribution of protocol for connecting haemodialysis among staff nurses between pre and post in dialysis unit

Sl. No	Protocol	Pre test		Post test	
		f	(%)	f	(%)
1	Physiological parameter				
	Excellent practice	-	-	52	87
	Very good practice	28	47	8	13
	Good practice	32	53	-	-
2	Haemodialysis catheter connection checklist				
	Excellent practice	-	-	52	87
	Very good practice	28	47	8	13
	Good practice	32	53	-	-
3	Arteriovenous fistula cannulation checklist				
	Excellent practice	-	-	52	87
	Very good practice	28	47	8	13
	Good practice	32	53	-	-

Table -2 shows that the protocol for connecting haemodialysis in staff nurses results shows that Physiological parameter 32 (53%) had good practice , and 28 (47%) had very good practice in pre test scores and 52(87%) had Excellent practice and 8(13%) had very good practice in the post test

With regard to Haemodialysis catheter connection checklist in staff nurses, the pre test scores 32 (53%) had good practice, and 28 (47%) had very good practice, in post test 52(87%) had Excellent practice and 8(13%) had very good practice.

With regard to Arteriovenous fistula cannulation checklist in staff nurses, the pre test scores 32 (53%) had good practice, and 28 (47%) had very good practice and in post test 52(87%) had Excellent practice and 8(13%) had very good practice.

SECTION III:-

Table 3:-Effectiveness of protocol for connecting haemodialysis on CKD patients among dialysis staff nurses between pre and post test in dialysis unit

(n=60)

SL NO	Level of practice	Pre test		Post test	
		f	%	f	%
1	Excellent practice	-	-	42	70
2	Very good practice	27	45	18	30
3	Good practice	33	55	-	-



Table3:- shows that in staff nurses, during the pre test 27(45%) had very good practice, 33(55%) had good practice where as in post test 42(70%) had Excellent practice 18(30%) had very good practice

SECTION IV:-

Table 4:-Comparison of mean and standard deviation of pre-test and post test scores of connecting haemodialysis in staff nurses (n=60)

SL. NO	Group	Pre test		Post test		'Z' value
		Mean	SD	Mean	SD	
1	Staff nurses	39.66	6.29	67.91	8.24	c=5.24, t=2.660 df=59, p<0.05 S*

Table 4: The results indicate that in staff nurses, the pre test mean is 39.66 and standard deviation is 6.29 and whereas the post test mean is 67.91 and standard deviation is 8.24. The calculated value is 5.24 greater than tabulated value is 2.66. The calculated value is greater than tabulated value. So, it can be concluded that, there is a significant improvement of connecting haemodialysis on CKD patients among the staff nurses.

SECTION-V

Table 5:-Association between protocol for connecting haemodialysis with socio demographic variables of staff nurs (n=60)

Demographic variables	Very good practice		Excellent practice		Chi square χ^2
	f	%	f	%	
Age in years					C=5.75
20-25 years	6	10	15	25	t= 5.99
26-30 years	7	17	30	50	at df=2
31-35 years	-	-	2	3	p<0.05 NS
Gender					C=5.75
Male	4	7	5	8	t= 5.99
Female	14	23	17	28	at df=2
					p<0.05 NS
Educational Qualification					C=6.4
B.Sc(N)	17	28	18	30	t= 5.99
Post B.Sc (N)	3	5	1	2	at df=2
GNM	17	28	4	7	p<0.05 S*
Clinical Experience.					C=6.13
< 1year	2	3	5	8	t=5.99
1-3 year	4	7	26	43	at df=2
4-5 year	1	2	22	37	p<0.05 S*
Marital status					C=3.68
Married	9	15	20	33	t=3.84
Unmarried	7	12	24	40	at df=1
					p<0.05 NS
Designation					C=6.1
In-charge	-	-	3	5	t= 5.99
B.Sc Staff	4	7	31	52	at df=2
GNM staff	2	3	20	33	p<0.05 S*
Attended CNE programme related to dialysis.					C=3.72
Yes	6	10	31	52	t=3.84
No	5	8	18	30	at df=1
					p<0.05 NS

P<0.05 level of significance

S* - Significant

t-table value

C- Calculated value

NS- No significant

df=(r-1)(c-1)

Table 10 shows that association between the post test scores on effectiveness of protocol for connecting haemodialysis on CKD patients among staffs with selected socio demographic variables in staff nurses.



- With regard to **age** in staff nurses the calculated value is 5.75 and table value is 5.99. The calculated value is less than the table value. So, there is no significance at the level of $p < 0.05$
- Concern with **Gender** in staff nurses the calculated value is 3.81 and table value is 3.84. The calculated value is less than the table value. So, there is no significance at the level of $p < 0.05$.
- Pertaining to **Educational Qualification** in staff nurses the calculated value is 6.4 and table value is 5.99. The calculated value is greater than the table value. So, there is significance at the level of $p < 0.05$
- About the duration of **Clinical experience** in staff nurses the calculated value is 6.13 and table value is 5.99. The calculated value is greater than the table value. So, there is significance at the level of $p < 0.05$
- In the context of **Marital status** in staff nurses the calculated value is 3.68 and table value is 3.84. The calculated value is less than the table value. So, there is no significance at the level of $p < 0.05$
- In association with **Designation** in staff nurses the calculated value is 6.0 and table value is 5.99. The calculated value is greater than the table value. So, there is significance at the level of $p < 0.05$
- About the history of **attended CNE programme related to dialysis** in staff nurses the calculated value is 3.72 and table value is 3.84. The calculated value is less than the table value. So, there is no significance at the level of $p < 0.05$

5. MAJOR FINDINGS OF THE STUDY:

The results shows effectiveness of protocol for connecting haemodialysis on CKD patients among dialysis staff nurses in experimental group, the calculated 'Z'

Value of checklists (5.24) is greater than the table value (2.66) at (0.05), So the null hypothesis is rejected and research hypothesis is accepted.

The study reveals that there is a significance improvement by assessing of protocol for connecting haemodialysis on CKD patients among the staff nurses in dialysis unit in experimental group.

The association between effectiveness of protocol for connecting haemodialysis on CKD patients among the staff nurses with post test scores in experimental group with their selected socio-demographic variables shows that there is significant such as educational qualification, clinical experience and designation and there is no significant such as age, gender, marital status and attended CNE programme.

6. IMPLICATIONS OF THE STUDY:

Nursing education:

Education in nursing has a vital role to play because the students who have learned today are going to deal with human beings tomorrow". Hence the right method of education with opportunity to practice and apply what was been taught is essential.

Nursing practice:

The protocol for connecting haemodialysis helps to enhance the quality of nursing practice. The goal emphasizes the need of nurse to be knowledgeable and informed to provide safe, effective and protective care for patients with haemodialysis

Nursing administration:

The hospital administration is the key person to plan, organize and conduct in-service education programme to nursing personnel regarding the connecting haemodialysis in dialysis unit. Nursing teachers should teach regarding haemodialysis to student's nurses in order to enhance the outcome of the patients

Nursing research:

Research could be conducted on a large sample with a view to develop a procedure annual or policy. The importance of research utilization in clinical practice in relation to improve the patient outcome, enhance professional practice and deliver the cost effective service

7. CONCLUSION:

Protocol for connecting haemodialysis on selected checklist helps the staff nurses to provide effective care while connecting haemodialysis on CKD patients and to improve the quality of care and cost effectiveness.

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