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Effect of Structured Nursing Intervention on Knowledge and Treatment Adherence Among Patients With End Stage Renal Disease in Kano Metropolis

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ABSTRACT

Background: Chronic Renal Failure is a progressive irreversible deterioration in renal function in which the body's power to maintain metabolic, fluid, and electrolyte balance fails, resulting in uremia which contributes to the patient's dependence upon hemodialysis for the maintenance of the internal milieu and to avoid uremia. Patients with end-stage renal disease (ESRD) are characterized by low levels of physical activity and a continuous decline in physical function. The main aim of the study was to assess the effect of structured nursing intervention on treatment adherence among patients with end-stage renal disease in Kano Metropolis.

Methods: This study utilized a two-group pretest-post-test quasi-experimental design. Patients receiving dialysis care at Muhammadu Abdullahi Wase Teaching Hospital and Abubakar Imam Urology Hospital were purposively selected as experimental and control groups respectively. A total of 422 participants were estimated and selected for the study and equally shared among the two groups, i.e. 211 for the control and 211 for the experimental group. All statistical data were analyzed and described using simple frequencies, Chi-square, T-test and regressions.

Results: Regarding treatment adherence, the pre-intervention mean score was 52.9 and 50.00, and the post-intervention score was 73.2 and 54.6 in the intervention and control groups, respectively. The effectiveness of the intervention was tested using unpaired t-test which was found to be significantly effective ($p < 0.005$).

Conclusion: Based on the findings of the study, the structured nursing intervention was effective in improving the level of knowledge regarding the disease and treatment adherence ($p < 0.005$) among patients with end-stage renal disease in the Kano metropolis. It is therefore recommended that the nephrology nurses, hospital administrators, and the general public join hands to make the services accessible and affordable to these patients to maintain their normal life activities through good adherence to the treatment regimen.

Keywords:

Effect, Structured, Nursing Intervention, Adherence, Quality of Life, End Stage Renal Disease

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Introduction

Chronic Renal Failure is a progressive irreversible deterioration in renal function in which the body's power to maintain metabolic, fluid, and electrolyte balance fails, resulting in uremia which causes the patient to depend on hemodialysis for the maintenance of the internal milieu and to avoid uremia. In the early stage of renal damage, symptoms may be reduced through hemodialysis, control of fluid intake and regulation of diet, and use of medication, as renal function worsens, these treatments become insufficient (Agarwal et al.,

2019). It is a global health problem affecting 10% of the population, and millions die each year because they do not have access to affordable treatment to improve their quality of life (Faqs, 2015). The weight of the disease is felt more in rising countries like Nigeria where there is no health indemnity to meet the massive economic stress faced by the sufferers and their families (Adejumo et.al, 2016). Chronic kidney disease (CKD) is a non-transmissible disease condition happening due to a rise in the occurrence of hypertension, diabetes,

and glomerulonephritis, it affects approximately 500 million adults globally.

End-stage renal disease (ESRD) is a disease with profound effects on a patient's life, with serious physiological, psychological, and socio-economic implications for the individual, family, and community (Talas & Bayraktar, 2020). Hemodialysis has allowed longer survival of patients with ESRD, thus increasing the incidence of patients on dialysis throughout the world (Miles & Friedman 2021). The increase in prevalence and incidence of kidney failure may be related to poor treatment outcomes, and the high cost of therapy (Levey, 2017 and Peter, 2019). Renal disease progression can be prevented or delayed by early detection and treatment. Elimination of several drugs and their metabolites is through the renal system. Therefore, irrational drug use in patients with renal impairment (RI) may have toxic effects (Manian, 2020 and Turnheim, 2019).

Patients with end-stage renal disease (ESRD) are characterized by low levels of physical activity and a continuous decline in physical function. Observational studies have revealed that physical inactivity is associated with increased mortality in these patients. Patients have a substantial and sustained decline in functional status, especially during the period before and after initiation of dialysis, in addition to dramatically high mortality (Glover, et. al, 2021). Among the many reasons for low levels of physical activity in end-stage renal disease, three factors contribute most. Reduced muscle strength caused by muscle catabolism and wasting, a substantially increased cardiovascular risk in combination with a high prevalence of comorbid disorders, both leading to a reduced health-related quality of life (QoL), which is in itself part of a vicious cycle further impairing physical activity with subsequently reduced physical fitness. (Eckardt, et.al 2018). End-stage renal disease (ESRD) is a disease with profound effects on a patient's life, with serious physiological, psychological, and socio-economic implications for the individual, family, and community (Talas & Bayraktar, 2020). Hemodialysis has allowed longer

survival of patients with ESRD, thus increasing the incidence of patients on dialysis throughout the world (Miles & Friedman 2021).

Aim of the study

The main aim of the study is to assess the effect of structured nursing intervention on adherence and quality of life among patients with end-stage renal disease undergoing hemodialysis in Kano Metropolis.

Objectives of the Study

1. To assess the level of knowledge regarding end-stage renal disease among the patients before and after the intervention.
2. To assess the level of treatment adherence among the patients with end-stage renal disease in before and after the intervention.
3. To assess effect of the intervention on level of knowledge and treatment adherence patients with end stage renal disease in Kano Metropolis.

Research Design

This study utilized a quasi-experimental design. Two groups pretest-posttest quasi-experimental research design was considered appropriate for the study.

Target Population

These consist of all patients with end-stage renal disease (ESRD) undergoing hemodialysis in Kano metropolis. The monthly estimate of the study population of patients with end-stage renal disease (ESRD) undergoing hemodialysis in Abubakar Imam Urology Centre and Muhammad Abdullahi Wase Teaching Hospital, Kano State were 240 and 360 respectively (Hospitals record departments,2022). The total estimated population of the study is now $600 \times 12 = 7200$.

Inclusion Criteria:

Age 18-80 years
End-stage renal disease and on Hemodialysis
Willing to participate in the study

3.6.1 Exclusion Criteria

1. Those with co-morbid HIV

2. Patients on hemodialysis not indicated by renal disorder e.g. Pericarditis, uremic encephalopathy, etc.

Sampling Technique

A purposive sampling technique was used to select the two tertiary hospitals in the Kano metropolis i.e. Muhammad Abdullahi Wase Teaching Hospital and Abubakar Imam Urology Hospital. These hospitals were considered to be more appropriate because they have a higher number of patients receiving dialysis care in Kano. Muhammad Abdullahi Wase Teaching Hospital was used for the experimental group because of the availability of physical and material resources needed for conducive educational intervention while Abubakar Imam Urology Hospital was used as a control. Patients that met the study criteria in these two facilities were purposely recruited.

Instruments for Data Collection

Two instruments were used in data collection during the study i.e. end stage renal disease Knowledge questionnaire and end stage renal disease adherence questionnaire (ESRD-AQ).

1. End stage renal disease Knowledge Questionnaire

This is an adopted questionnaire used in a previous similar study to assess the level of knowledge of the participants regarding end-stage renal disease (Chow et al., 2021). The self-administered questionnaire included seven (7) questions to assess the knowledge of chronic kidney disease and additional questions on demographics. The questions were developed using a combination of patient references for chronic kidney disease. The questions were close-ended response type multiple choice questions to assess the knowledge of the respondents in the following seven (7) domains:

1) Anatomy, 2) Physiology (function of the kidney), 3) Etiology of Chronic kidney disease; 4) Symptoms of early chronic kidney disease, 5) Progression, 6) Treatment of end-stage renal failure, and 7) Resource available to chronic kidney disease patients.

2. End stage renal disease treatment adherence questionnaire (ESRD-AQ).

End-Stage Renal Disease Adherence Questionnaire (ESRD-AQ) by Kim, Evangelista, Phillips, Pavlish, and Kopple (2010) is also an adopted standardized Adherence to Treatment questionnaire. This tool was used to collect data on adherence to treatment among hemodialysis patients. The End-Stage Renal Disease Adherence Questionnaire (ESRD-AQ) for patients requiring in-center hemodialysis was designed to measure treatment adherence behaviors in four dimensions: hemodialysis attendance, medication use, fluid restrictions, and dietary restrictions recommendations. The End Stage Renal Disease Adherence Questionnaire (ESRD-AD) consists of 46 questions divided into sections. and the sections ask about treatment adherence to hemodialysis sessions (17 items), medications (8 items), fluid restrictions (7 items), and dietary recommendations (8 items). Responses to the ESRD-AQ utilize a combination of Likert scales and multiple choices, as well as “yes/no” answer format.

Method of Data Collection

Ethical clearance (SHREC/2022/3800) to conduct the study was received from the ethical review board of the Kano State Ministry of Health. The ethical clearance and letter of introduction was used to seek permission to conduct the study at the selected health facilities. Permission to study the patients was also obtained from the in charge of the renal unit. The study just like any other interventional study was conducted in three phases and was reported as such i.e. preintervention phase, intervention phase and post-intervention phase.

Ethical Consideration

Ethical clearance (SHREC/2022/3800) was received from the ethical review board of Kano State Ministry of Health. The ethical clearance was used to facilitate the process of the two hospitals entry. Permission to conduct the study at the selected health facilities were sought from the in charges of the health facilities. The Right of participants was respected throughout the period of study. Participants were informed on the purpose of the study, their roles, possible benefits, potential

risk, period of study, voluntariness of participation, confidentiality of findings and contact of researcher.

RESULTS

Table 4.1 Distribution of intervention and control groups according to sociodemographic characteristics.

Variable	Study Group (N=209)		Control Group (N=209)		X ²	P value
	F	%	F	%		
Age in years						
18-24	5	2.4	7	3.3	1.12	0.98
25-32	5	2.4	5	2.4		
32-38	27	12.9	32	15.3		
39-45	55	26.3	55	26.3		
46-52	61	29.2	57	27.4		
53-59	44	21.1	40	19.1		
Above 60	12	5.7	13	6.2		
Mean age	46.2±6.5		45.5±4.3			
Gender						
Male	128	61.2	130	62.2	0.04	0.84
Female	81	38.8	79	37.8		
Marital Status						
Married	134	64.1	142	67.9	1.12	0.77
Divorced	14	6.7	14	6.7		
Single	54	25.8	45	21.5		
Widow	7	3.3	8	3.9		
Religion						
Islam	186	89.0	189	90.4	0.23	0.63
Christianity	23	11.0	20	9.6		
Occupation						
Civil Servant	36	17.2	11	5.3	10.3	0.1
Business	88	42.1	92	44		
Employed	62	29.7	73	34.9		
Unemployed	23	11.0	33	15.8		
Education						
Tertiary	28	13.4	14	6.7	5.30	0.15
Secondary	27	12.9	28	13.4		
Primary	88	42.1	98	46.9		
Informal	66	31.6	69	33.0		

X² = Chi-square

Findings as indicated above shows that participants in both the intervention (29.2%) and control group (27.7) are between the ages of 50 and 57 years. The mean age of participants in the intervention group is 46.2 while that of the control group is 43.5. The majority of the respondents in both groups are male. Also, the majority of the

respondents 134(64.1%) in intervention and 172(83.5%) in control are married. Most of the respondents 88 (42.1%) and 92(44.7%) in intervention and control respectively are businessmen and women. The greater number 88(42.1%) and 98(47.6%) in the intervention and control group have a primary education certificate.

Table 4.2: Pre and Post intervention mean scores on knowledge regarding end stage renal disease among the intervention and control groups

Groups	Pre-intervention				Post intervention			
	Mean	Std Deviation	Std error	Mean Difference	Mean	Std Deviation	Std error	Mean Difference
Intervention (N=209)	3.9	3.02	0.20	0.3	6.85	2.90	0.20	3.15
Control (N=209)	3.6	3.52	0.3		3.70	3.45	0.3	
	t= 1.35	p= 0.10			t= 15.5	p= 0.00*		

*Inadequate < 3, Moderate;3.1-4.9, Adequate; 5.1-7.0

Table 4.2 above revealed that the mean score of the participants before the intervention among the groups was 3.9 and 3.62 in the intervention and control groups respectively. The findings further reveal that both the two groups have similar knowledge regarding the disease before the

intervention. The study revealed the post-intervention knowledge score was 6.85 in intervention and 3.70 among the control group. Also, the unpaired sample t-test revealed a significant result (t=15.5 and p=0.00).

Table 4.3: Pre and Post intervention mean score on treatment adherence among the intervention and control groups

Groups	Pre-intervention				Post intervention			
	Mean	Std Deviation	Std error	Mean Difference	Mean	Std Deviation	Std error	Mean Difference
Intervention (N=209)	52.90	8.01	0.56	2.90	73.20	6.03	0.42	18.6
Control (N=209)	50.00	8.33	0.58		54.60	8.67	0.59	
	t= 3.76	p= 0.88			t= 25.5	p=0.00*		

*Poor<25, Low; 25-49, Moderate;50-69, Good; 70-100

Table 4.3 above revealed that the overall mean pre-intervention scores of the intervention and control groups were 52.90 and 50.00 respectively. It further reveals that both the two groups have the same level of treatment adherence which is moderate before intervention. The post-

intervention treatment adherence score of the intervention and control group were 73.2 and 54.57 respectively. The intervention group has a higher score compared to the control group. The effect was tested using an unpaired t-test which revealed significance (t=25.5 and p=0.00).

Table 4.5: Effect of the intervention on level of knowledge and treatment adherence among the patients with end stage renal disease (N=209)

	Group	Mean Score	T-value	T value
Knowledge	Intervention	6.85	15.5	0.00*
	Control	3.70		
Treatment adherence	Intervention	73.2	25.5	0.00*
	Control	54.6		

*Significant

Table 4.5 above reveals that there is a significant effect of the intervention on knowledge and adherence. The significance was tested after intervention using a t-test with a p-value of 0.00 in all three variables.

Discussion of Findings

About the sociodemographic characteristics of the participants, the results of the study showed that the majority of the participants in both groups were between the ages of 45-52 years with a mean age of 46.2 ± 6.5 in the intervention group and 45.5 ± 3.2 in the control group). Male gender was found to be the majority in both groups (61.2% and 73.8% in intervention and control respectively). On the educational status of the participants, findings of the study revealed that the majority of the respondents in both groups had informal and primary education 88(42.1%) and 98(47.6%) in the intervention and control groups.

On the aspect of knowledge regarding the disease, the study revealed that the mean preintervention knowledge score was 3.9 and 3.62 in the intervention and control groups respectively. The findings further reveal that the two groups have similar levels of knowledge regarding the disease. With regards to treatment adherence, the study revealed that the aggregate mean preintervention score of the intervention and control group was 52.90 and 50.00 respectively. It further reveals that both the two groups have the same level of treatment adherence which is moderate before the intervention.

Summary

The main aim of the study was to assess the effect of structured nursing intervention on knowledge regarding the disease and treatment adherence among patients with end-stage renal disease undergoing hemodialysis in Kano Metropolis. The specific objectives of the study are to assess the level of knowledge regarding end-stage renal disease among the patients before and after the intervention, and to assess the level of treatment adherence among the patients with

end-stage renal disease before and after the intervention.

This study utilized a quasi-experimental design, the two-group pretest-post-test quasi-experimental research design was considered appropriate for the study. A total of 422 participants were selected for the study, 211 for control and 211 for experimental group and all were selected using purposive sampling. The informed consent of each respondent was sought and only those who gave consent were recruited into the study. All consecutive eligible participants at the renal units were included until the estimated sample size of participants is achieved. A proforma questionnaire was administered by the researcher and his assistants to all eligible participants who gave their informed consent.

Findings from the study revealed that participants in both the intervention (29.2%) and control group (27.7) are between the ages of 50 and 57 years. The mean age of participants in the intervention group is 46.2 while that of the control group is 43.5. The majority of the respondents in both groups are male. Also, the majority of the respondents 134(64.1%) in intervention and 172(83.5%) in control are married. Most of the respondents 88 (42.1%) and 92(44.7%) in intervention and control respectively are businessmen and women. The greater number 88(42.1%) and 98(47.6%) in the intervention and control group have a primary education certificate. The study also revealed the pre-intervention aggregate knowledge score is 3.9 and 3.6 while post-intervention it becomes 6.85 and 3.7 in intervention and study groups respectively. In the aspect of treatment adherence, the preintervention mean was 52.9 and 50.00 while post-intervention was 73.2 and 54.6 among intervention and control groups.

Conclusion

Based on the findings of this study, the structured nursing intervention was effective in improving the level of knowledge and treatment adherence among patients with end-stage renal disease in the Kano metropolis. There is a higher score in the

aspect of knowledge and treatment adherence among the participants in the intervention compared with the control group after the intervention. It is therefore expected that in line with the philosophy of the study, the study results if scaled up and implemented will improve the level of knowledge regarding the disease and treatment adherence among the patient with end-stage renal diseases. In line with the findings of the study, the researcher recommends that health care workers be diligent on their duties, Government at all levels need to support patients with end stage renal disease and make the care affordable and assessable to all.

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