- ***Basic Research***

The Effect of Nursing Intervention Guidelines on Vascular Access Self-Care Practices and Quality of Life Among Patients on Maintenance Hemodialysis

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Abstract

Background: Chronic kidney disease is a world-wide public-health problem, as it can progress to end stage renal disease, and the patient is treated with hemodialysis. The level of self-care practices and quality of life among patients on maintenance hemodialysis is a successful way to decrease the incidence of complications. **Aim of the study:** The study aimed to evaluate the effect of nursing intervention guidelines on vascular access self-care practices and quality of life among patients on maintenance hemodialysis. **Design and Setting:** A quasi-experimental research design was utilized. The study was carried out in the hemodialysis department at Kasr El Aini university Hospital affiliated to Cairo University, Cairo, Egypt. **Subjects:** A convenient sample of 160 adult male and female patients on maintenance hemodialysis. **Tools:** Three tools were used to collect data; **Tool I:** Structured interview questionnaire for patients with vascular access: This tool consists of three parts: **Part 1:** Patient's socio demographic characteristics, **Part 2:** Patient's clinical data, and **Part 3:** Knowledge of patients connected with vascular access (pre and posttest) Needs assessment. **Tool II:** Self-care practice scale for arteriovenous fistula in hemodialysis patients (ASBHD-AVF), and **Tool III:** Kidney Disease and Quality of Life (KDQOL-SF36). **Results:** There was a highly statistically significant difference in patient's knowledge and self-care practices in the pre, immediately post, and 6 months post implementation of nursing intervention guidelines (P>0.001) which showed a progress in patient's performance. More than half (58%) of the study sample had a very good quality of life post implementation of nursing intervention guidelines. **Conclusion:** The finding of the study concluded that hemodialysis patients who receive nursing intervention guidelines had improvement in self-care practices and quality of life. **Recommendation:** Educational sessions by health care professionals in the haemodialysis department about the self care practices for vascular access is required.

Key words:
Vascular Access, Self-care practice, Quality of life, Maintenance Hemodialysis.

1. Introduction

Chronic kidney disease (CKD) represents a growing global health problem, affecting millions of individuals worldwide. As CKD progresses to end-stage renal disease (ESRD), patients often require hemodialysis as a life-sustaining therapy. Vascular access, how blood is safely removed and returned during hemodialysis, plays a fundamental role in the success of hemodialysis therapy, Various types of vascular access options are available, such as an arteriovenous fistula (AVF) on the non-dominant lower arm is the recommended method of access. If the natural vessels are insufficient for such access, an arteriovenous graft for punctures can be constructed by inserting a synthetic vascular graft between an artery and a vein., and finally, the central venous catheters (CVCs) can be used as a way for vascular access **(Stegmayr et al., 2021 ; Woodside et al., 2018).**

Complications associated with vascular access, including infections, thrombosis, and stenosis, establish significant risks to the overall well-being of patients on maintenance hemodialysis. These complications not only compromise the effectiveness of hemodialysis but also increase morbidity and healthcare costs. Addressing these challenges necessitates a multifaceted approach that involves both patient education and self-care with vascular access care protocols **(Yang et al., 2019; Wan & Tang., 2022).**

Vascular access is a hemodialysis patient's lifeline, because it makes life-saving hemodialysis treatments possible, and it plays an important role in management of patients requiring hemodialysis. Proper care of vascular access is necessary to ensure its longevity and minimize complications. Patients' knowledge and self-care practices with vascular access care guidelines are critical factors in achieving the best outcomes **(National kidney Federation, 2021).**

Assessment of health-related quality of life is an analytical indicator of the outcome of the disease, as well as a valued research tool in assessing the effectiveness of therapeutic intervention, patients' survival, and hospitalizations **(Gerasimoula et al., 2015; Pretto et al., 2020).** Nurses bear a large deal of responsibility and have a curial role in providing care for patients on maintenance hemodialysis to enhance patients' knowledge on vascular access care and, subsequently, improve their self-care practices regarding vascular access, which will be reflected on enhancing the overall quality of life during their hemodialysis journey, and saving of vascular access, which is considered the lifeline for hemodialysis patients.

Significance of the study:

Chronic kidney disease (CKD) is a global healthcare concern, affecting millions of individuals worldwide. There are now more than one million dialysis patients throughout the world, with an incidence of about a quarter of a million new patients each year are treated with dialysis or with vascular access. The number of deaths caused by (CKD) is increasing worldwide, in 2017, 1,230.2 million people died (**Sobh, Hassanin, and El-Aziz Mowafy., 2017).** CKD is one of the main health challenges in Egypt. CKD affects approximately 13% of the adult population, resulting in extensive morbidity, mortality, and health care costs (**Nagib et al., 2023; Kosa, &Lok., 2017).** According to the Egyptian Society of Nephrology and Transplantations (ESNT), the Annual Report of The Egyptian Renal Registry (2020), End-Stage Renal Disease is becoming more common over the world, with a prevalence of 1500 per million population (pmp) (0.15%). Each year, the prevalence of ESRD in Egypt was 74 per million population, with a total prevalence of dialysis patients of 264 per million population (0.0264 %) (**Hassaballa et al., 2022**).

The occurrence and the prevalence of CRF are gradually increasing-by 8%-throughout the world, especially in developing countries. Hemodialysis is a life-sustaining treatment for

end-stage renal disease (ESRD) patients, and the success of this therapy heavily relies on the establishment and maintenance of functional vascular access **(Hashemi et al., 2015).** So, this research aims to evaluate the effect of nursing intervention guidelines on vascular access self-care practices and quality of life among patients on maintenance hemodialysis.

Aim of the study:

This study aimed to evaluate the effect of nursing intervention guidelines on vascular access self-care practices and quality of life among patients on maintenance hemodialysis through the following:

1- Assessing the vascular access level of knowledge and self-care practices for patients on maintenance hemodialysis.
2- Assessing the quality of life dimension for patients on maintenance hemodialysis.
3- Developing and implementing nursing intervention guidelines regarding vascular access self-care practices based on patients' assessment.
4- Evaluating the effect of nursing intervention guidelines on patients' level of knowledge, self care practices and quality of life for patients on maintenance hemodialysis.
5- Investigate the relationship between knowledge improvement and self-care with vascular access care guidelines.

Research hypotheses of the study:

H_1. Patients who follow the nursing intervention guidelines exhibit improved vascular access self-care practices than the patients who don't follow the nursing intervention guidelines.

H_2. Patients who follow the nursing intervention guidelines exhibit improved quality of life with vascular access than the patients who don't follow the nursing intervention guidelines.

2. Materials and Method

Materials

Research design:

A quasi-experimental design (pre and posttest) was utilized to accomplish this study purpose.

Settings:

The study was carried out at the hemodialysis department at Kasr El Aini university Hospital affiliated to Cairo University, Cairo, Egypt. The sitting composed of 2 hemodialysis units, each unit provide service of dialysis for outpatients and inpatients, one of them in the second floor in outpatient clinic, and the second one in King Fahd unit in the seventh floor.

Subjects:

The study subjects comprised a convenient sample of 160 adult male and female patients on maintenance hemodialysis. All studied patients were selected according to the following criteria:

- Male and female adult patients ranging from 20- 60 years old.
- Able to communicate effectively and follow instructions.
- On maintenance hemodialysis three times weekly.
- Patients had smart phones and was able to use WhatsApp group.

Sample size calculation: EPI INFO program was used to calculate the sample size applying the following parameters: Population size = 270, Expected frequency = 50%, Acceptable

error = 5%, Confidence co-efficient = 95%, Minimum sample size = 159, increased to 160.

Tools for data collection: In order to fulfill the objective of the study, three tools were used for data collection.

Tool I: Structured interview questionnaire for patients with vascular access:

This tool was developed by the researchers after reviewing the related literatures (**Whdan et al., 2019)**, to collect baseline data. It was divided into three parts as the following:

Part 1: Patient's socio demographic characteristics: Including (age, gender, marital status, level of education, occupation, smoking and income.

Part 2: Patient's clinical data: Including medical history, years on maintenance hemodialysis, type of vascular access, and number of dialysis sessions per week.

Part 3: Knowledge of patients connected with vascular access (pre and posttest):

This part was designed to assess patient's knowledge regarding vascular access, it was adapted from (**Diab & Mostafa., 2019**), it consisted of 41 questions to assess patient's knowledge regarding (renal failure disease 8 questions, diet and fluid regimen 9 questions, medication regimen 5 questions, hemodialysis 4 questions and vascular access care 15 questions).

Scoring system of patient's level of knowledge:

- Answers were scored as the following:
  - Correct answer was scored =1
  - Incorrect answer or don't know was scored =0
- A total score for every patient was summed up and converted into percent score. The percent score of this scale was classified as the following:
  - Scoring of 60% and above was considered as **satisfactory** level of knowledge.
  - A score less than 60% were considered **unsatisfactory** level of knowledge.

Tool II: Self-care practices scale for arteriovenous fistula in hemodialysis patients (ASBHD-AVF):

This tool was consisted of 2 parts,

Part 1: It was adopted from (**Sousa et al., 2015),** to assess self-care practices for arteriovenous fistula in hemodialysis patients regarding (fluid management practice, diet, and medication), it consisted of 15 statements for each item of practice. a correct practice was scored "1" and "0" for the incorrect practice.

- **Part 2:** It was adopted from **(Sousa et al., 2015),** to assess vascular access management practice at home), it consists of 16 items distributed in two subscales: self-care in prevention of complications (10 items) and self-care in management of signs and symptoms (six items). Each item is scored according to a 5-point Likert scale ranging from 1 (Never carry out the self-care) to 5 (Always carry out the self-care).

Scoring system:

- The final score is found by adding all the item scores, with a minimum of 16 and a maximum of 80. Next, the ratio between the final score and the maximum was found.
- A total score for every patient was summed up and converted into percent score. The percent score of this scale was classified as the following:
  - Scoring of 60% and above was considered as **adequate** self-care practices.

- A score less than 60% were considered **inadequate** self-care practices.

Tool III: Kidney Disease and Quality of Life (KDQOL-SF36):

This tool was adopted from (Hays et al., 1994**),** to assess the quality of life of patients with kidney disease. The tool consisted of the following items (Physical functioning 10 items, role-physical 4 items, pain 3 items, general health 5 items, emotional well-being 5 items, role-emotional 3 items, social function 2 items, and fatigue 4 items).
The patient response was assessed on 5 points likert scale (Not at all, A little bit, Moderately, Quite a bit or Extremely)

Scoring system:

To convert these responses into numbers for scoring, a standardized system is applied. Typically, the responses are assigned numerical values, and these values are then used to calculate raw scores. The raw scores are further transformed into a 0-100 scale, as explained earlier. (Not at all= 0, A little bit= 25, Moderately= 50, Quite a bit= 75, Extremely=100).

The final score of the total scale on the KDQOL-SF36 is often referred to as the composite score or summary score, which provides an overall measure of the individual's health-related quality of life. Once the scores for each domain are calculated and transformed into the 0-100 scale, an average may be taken to derive the overall composite score.

- 100= Excellent Quality of Life
- 75-99= Very Good Quality of Life
- 50-74= Good Quality of Life
- 25-49= Fair to Poor Quality of Life
- 0-24=Very Poor Quality of Life

Method

Content validity:

A panel of Five professors from the Medical Surgical Department. Faculty of Nursing, Ain Shams University and Helwan University, reviewed the tools for clarity, relevance. comprehensiveness, understanding and applicability.

Reliability:

The reliability of the added question was assessed by using test-retest for a group of 10 clients who were asked to answer the questions and were asked to answer the same questions after two weeks. The answers in the two testing were analyzed and computed for reliability. It reaches 85% (r = 0.85), which is considered reliable.

Ethical considerations

It was approved by the Research Ethics Committee at the Faculty of Nursing, Helwan University, before the beginning of the actual work. After describing the aim, methods, and significance of the study, the hospital director official approval was approved and were obtained from the directors of dialysis department to get their permission to conduct the study.Furthermore, after explaining the purpose of the study to the studied patients' oral agreement was obtained. They received guarantees about the privacy of the information gathered. The studied patients were informed of their right to participate in the study or not, as well as their right to withdraw from it at any moment.

Field of work:

The data was collected from the beginning of August 2023 to end of January 2024 in hemodialysis department at university hospital affiliated with Cairo University in Egypt., patients were interviewed in hemodialysis department 3 days per week (Saturday, Monday and Wednesday) in the morning and afternoon shifts from 10 am to 6 pm.

The study was conducted through four phases, namely; assessment, planning, implementation and evaluation phase.

1. Assessment phase: Researchers conducted initial assessment through individual interview with each studied patient, to assess baseline data about sociodemographic characteristics, clinical data, patient's level of knowledge, self-care practices and quality of life, using tool I, II, and III. A simple introduction about the aim and duration of the study was done, it took between 25 and 40 minutes.

2. Planning phase:

- ✓ According to the data collected from the initial assessment phase, the planning of nursing intervention guidelines was developed for patients by the researchers.
- ✓ An Arabic booklet for patients on maintenance hemodialysis, regarding self-care and needed information about diet, fluid intake, medications, and home self-care was developed by researchers based on studied patients' needs identified during the assessment phase.

3. Implementation phase:

- ✓ Nursing intervention guidelines was given in simplified Arabic language, in five theoretical sessions to discuss the following items (disease information, diet and fluid intake, medications, hemodialysis, and vascular access care, and one practical session related to vascular access care.
- ✓ Each session lasted from 15 to 20 minutes. Each session began with a review of the previous session and the objectives of the present one.

4. Evaluation phase: The researchers evaluate the effect of implementing the nursing intervention guidelines on patients' knowledge, and self-care practices, immediately and 6 months post nursing intervention to evaluate the patient's retention of the knowledge and self-care they have learned. But the effect of intervention on patient's quality of life evaluated 6 months post nursing intervention guidelines. The goal of establishing this interval was to evaluate if an interventions were beneficial after a period of implementation. Communication with the studied patients was maintained through a WhatsApp group to answer questions, and to raise or schedule for follow-up meeting.

Statistical analysis:

Results were tabulated and statistically analyzed using standard computer program using SPSS V.24 program.

Categorical variables were described by number and percent (N, %), where continuous variables described by mean and standard deviation (Mean, SD). Chi-square test, ANOVA and fisher exact test used to compare between categorical variables $p < 0.05$ was considered statistically significant.

3. Results:

Table (1): Shows percentage distribution of the studied patients according to socio demographic characteristics. The studied patients aged 45-60 years were 52.4%, with mean age 42 ±3.98. Also, 55% of them were males, 93.8% were married and regarding educational level 33.8 % of them were illiterate. While 53.8% of them were manual workers. The table also showed that 52.2% of studied patients had insufficient income. In addition to, 93.7% of them weren't smokers.

Table (2): Declares percentage distribution of the studied patients according to their clinical data. The table demonstrated that more than one quarter (28.75%) of the studied patients, had medical history of diabetes mellitus. 45.6% of them had ⩾5 years dialysis duration. Regarding number of previous AVFs, 58.75% of studied patients had it once, with mean duration of AVF

was 52 ±5.36. Also 49.4% of studied patients had arteriovenous fistula as an access for dialysis.

Table (3): Illustrates percentage distribution of the studied patients according to their level of knowledge pre, immediately post and 6 months post implementation of nursing intervention guidelines. 20%, 13.8%, 25%, 22.5% and 21.3% respectively of the studied patients had a satisfactory level of knowledge regarding the nature of renal failure, the diet and fluid regimen, medication regimen, hemodialysis procedure, and vascular access care pre implementation of nursing intervention guidelines. While it increased to 96.25%, 97.5%, 91.25%, 100% and 100% immediately post- implementation of nursing intervention guidelines, Additionally, it changed to be 91.255%, 90%, 88.8%, 93.75% and 97.5% 6 months post- implementation of nursing intervention guidelines, and statistical significances between pre, immediately post and 6 months post- implementation of nursing intervention guidelines, were highly significant ($P<0.001$).

Figure (1): Illustrates overall patients' satisfactory level of knowledge pre, immediately post and 6 months post implementation of nursing intervention guidelines. One quarter of the studied patient (25%) had a satisfactory total level of knowledge pre implementation of nursing intervention guidelines, while the majority of the studied patients (96%) had a satisfactory total level of knowledge immediately post- implementation of nursing intervention guidelines, and 82% of them had a satisfactory level of knowledge 6 months post- implementation of nursing intervention guidelines.

Table (4): Illustrates percentage distribution of studied patients regarding self-care practices pre, immediately post and 6 months post implementation of nursing intervention guidelines. 15.6%, 7.5%, 11.9%, 6.25%, 14.4%, 5.6%, 15%, 21.9%, 10.6%, 29.4%, and 24.4% respectively of the studied patients were done an adequate self-care practices regarding weight follow up at home, controlling of fluid intake, types of fluid, number of meals/day, follow at home after session, way of cooking foods containing potassium, taking prescribed medication doses, occurrence of complications at home, dealing with cramps occurs at home, dealing with itching, and low blood pressure, pre implementation of nursing intervention guidelines, while it increased to 93.75%, 85%, 93.1%, 95%, 86.25%, 78.75%, 89.4%, 86.9%, 91.9%, 96.25%, and 91.9% respectively immediately post implementation of nursing intervention guidelines, Additionally, it changed to be 90.6%, 77.5%, 83.75%, 83.75%, 82.5%, 76.9%, 86.9%, 80.6%, 82.5%, 89.4%, and 76.9% respectively 6 months post implementation of nursing intervention guidelines, and statistical significant differences were found between pre, immediately post and 6 months post- implementation of nursing intervention guidelines, they were significant and highly significant ($P<0.5$). & ($P<0.001$).

Table (5): Represents percentage distribution of studied patients regarding self-care practices pre, immediately post and 6 months post implementation of nursing intervention guidelines (ASBHD-AVF Scale). It shows that, 100% of studied patients has an adequate level of their practice in pre implementation of nursing intervention guidelines regarding compression on the site of puncture to prevent bleeding even at home also didn't allow to take samples from the arm of fistula. While in post implementation of nursing intervention guidelines 100% of them address the nurse when have a headache or have a cramp during dialysis session, also regarding checking for signs of redness and swelling at the puncture sites, immediately go to a hospital or a clinic if the fistula has no thrill, checking every day for changes in the color of the hand of the fistula arm, apply ointment when hematoma occurs, feel the thrill at the fistula site twice a day and check every day if the hand of the fistula arm cools.

Figure 2: Illustrates overall patients' self-care practices pre, immediately post and 6 months post implementation of nursing intervention guidelines. There was an improvement in the

studied patient's level of self-care practices, 78% of studied patients had an adequate self-care practices immediately post implementation of nursing intervention guidelines, and slightly decreased 6 months post implementation of nursing intervention guidelines to 64% instead of 44% of them had an adequate self-care practices pre implementation of nursing intervention guidelines.

Figure 3: Illustrates overall patients' health-related quality of life (KDQOL-SF36) pre, and 6 months post implementation of nursing intervention guidelines. In 6 months post implementation of nursing interventions program 58% of studied patients had a very good quality of life, 28% had an excellent quality of life, 12% had a good quality of life, and 2% had a fair to poor quality of life while no one had a very poor quality of life.

Table (6): Depicts the relation between overall level of knowledge and self-care practices in studied patients pre, immediately post and 6 months post implementation of nursing intervention guidelines. There was a highly significant relation between level of knowledge improvement and self-care practices pre, immediately post and 6 months post implementation of nursing intervention guidelines ($P<0.001$).

Table (1): Percentage distribution of the studied patients according to socio demographic characteristics (N=160)

Socio demographic characteristics	NO	%
Age		
• 20< 35	34	21.3%
• 35 < 45	42	26.3%
• 45-60	84	52.4%
Mean= 42 ±3.98		
Gender		
• Male	88	55.0%
• Female	72	45.0%
Marital status		
• Single	6	3.8%
• Married	150	93.8%
• Divorced	4	2.5%
• Widow	0	0.0%
Educational level		
• Illiterate	54	33.8%
• Read and write	32	20.0%
• Primary school	42	26.3%
• Secondary school	32	20.0%
• Highly educated	0	0.0%
Occupation		
• Not working	52	32.5%
• Manual worker	86	53.8%
• Private work	22	13.7%
Smoking		
• Yes	10	6.3%
• No	150	93.7%
Income (from patient's point of view)		
• Sufficient	76	47.5
• Insufficient	84	52.5

Table (2): Percentage distribution of the studied patients according to their clinical

data (N=160)

Patient's clinical data	NO	%
Medical history:		
• Arterial Hypertension	17	10.6%
• Diabetes mellitus	46	28.75%
• Polycystic kidney	23	14.4%
• Autoimmune disease	16	10%
• Glomerular	22	13.75%
• Other kidney disease	36	22.5%
Dialysis duration		
• ⩽1 years	30	18.75%
• 1-5 years	57	35.6%
• ⩾5 years	73	45.6%
AVF duration in months, mean (SD)	**52 ±5.36**	
Number of previous AVFs		
• 1	94	58.75%
• 2	40	25%
• ⩾3	26	16.25%
Type of Vascular Access:		
• Arteriovenous Fistula (AVF)	79	49.4%
• Arteriovenous Graft (AVG)	59	36.9%
• Central Venous Catheter (CVC)	22	13.75%

Table (3): Percentage dist0ribution of the studied patients according to their level of knowledge pre, immediately post and 6 months post implementation of nursing intervention guidelines (N=160)

Patient's level of knowledge	Pre implementation of nursing interventions		Immediately post implementation of nursing interventions		6 months post implementation of nursing interventions		F	P-value
	N	%	N	%	N	%		
Renal failure (8 Questions)								
• Satisfactory	32	20.0	154	96.25	146	91.25	112.92	0.004*
• Unsatisfactory	128	80.0	6	3.75	14	8.75		
Diet and fluid regimen (9 Questions)								
• Satisfactory	22	13.8	156	97.5	144	90	76.07	0.000**
• Unsatisfactory	138	86.2	4	2.5	16	10		
Medication regimen (5 Questions)								
• Satisfactory	40	25	146	91.25	142	88.8	75.33	0.005*
• Unsatisfactory	120	75	14	8.75	18	11.3		
Hemodialysis (4 Questions)								
• Satisfactory	36	22.5	160	100.0	150	93.75	86.73	0.002*
• Unsatisfactory	124	77.5	0	0.0	10	6.25		
Vascular access care (15 Questions)								
• Satisfactory	34	21.3	160	100.0	156	97.5	63.24	0.000**
• Unsatisfactory	126	78.8	0	0.0	4	2.5		

**p<0.001 is highly significant *p<0.5 is significant F ANOVA

Figure (1): Overall patients' satisfactory level of knowledge pre, immediately post and 6 months post implementation of nursing intervention guidelines (N=160)

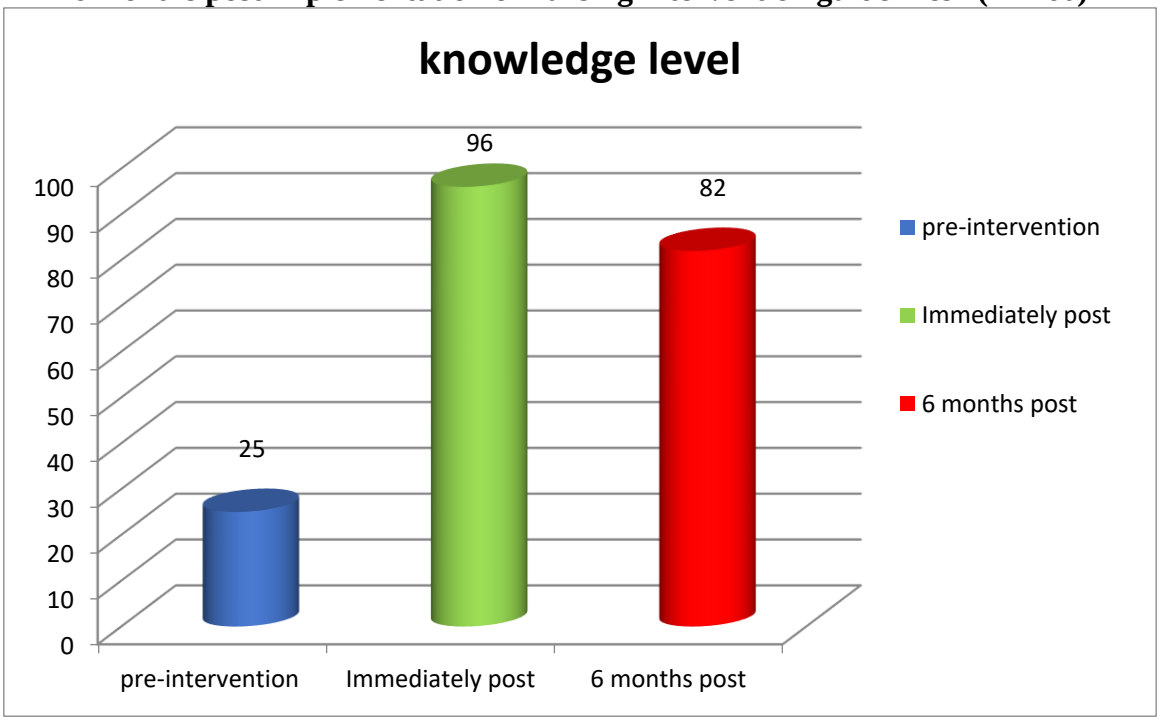

Table 4: Percentage distribution of studied patients regarding self-care practices pre, immediately post and 6 months post implementation of nursing intervention guidelines *(N=160)*

Patient's self-care practices	Pre		Post Immediate		Post 6 months		F	P-value
	N	%	N	%	N	%		
Weight follow up at home								
Adequate self-care	25	15.6	150	93.75	145	90.6	102.13	0.000**
Inadequate self-care	135	84.4	10	6.25	15	9.4		
Controlling of fluid intake								
Adequate self-care	12	7.5	136	85	124	77.5	98.34	0.000**
Inadequate self-care	148	92.5	24	15	36	22.5		
Respected types of fluid								
Adequate self-care	19	11.9	149	93.1	134	83.75	110.4	0.000**
Inadequate self-care	141	88.1	11	6.9	26	16.25		
Number of meals/day								
Adequate self-care	10	6.25	152	95	134	83.75	114.70	0.000**
Inadequate self-care	150	93.75	8	5	26	16.25		
Follow at home after session								
Adequate self-care	23	14.4	138	86.25	132	82.5	85.76	0.000**
Inadequate self-care	137	85.6	22	13.75	28	17.5		
Way of cooking foods containing potassium								
Adequate self-care	9	5.6	126	78.75	123	76.9	87.7	0.000**
Inadequate self-care	151	94.4	34	21.25	37	23.1		
Taking prescribed medication doses								
Adequate self-care	24	15	143	89.4	139	86.9	76.81	0.000**
Inadequate self-care	136	85	17	10.6	21	13.1		
Occurrence of complications at home								
Adequate self-care	35	21.9	139	86.9	129	80.6	23.5	0.021*
Inadequate self-care	125	78.1	21	13.1	31	19.4		
Dealing with cramps occurs at home								
Adequate self-care	17	10.6	147	91.9	132	82.5	18.54	0.019*
Inadequate self-care	143	89.4	13	8.1	28	17.5		
Dealing with itching								
Adequate self-care	47	29.4	154	96.25	143	89.4	96.56	0.000**
Inadequate self-care	113	70.6	6	3.75	17	10.6		
Dealing with low blood pressure								
Adequate self-care	39	24.4	147	91.9	123	76.9	104.34	0.000**
Inadequate self-care	121	75.6	13	8.1	37	23.1		

**p<0.001 is highly significant *p<0.5 is significant F ANOVA

Table (5): Percentage distribution of studied patients regarding self-care practices pre, immediately post and 6 months post implementation of nursing intervention guidelines *(N=160)*

ASBHD-AVF items	Pre		Immediately post		6 months post	
	Adequate self-care	Inadequate self-care	Adequate self-care	Inadequate self-care	Adequate self-care	Inadequate self-care
Self-care 1—Self-care practices management of signs and symptoms						
• I address nurses if the hand of the fistula arm exhibits wounds.	60%	40%	85%	15%	82%	18%
• I protect the fistula arm from bumps and shocks.	77%	23%	96%	4%	87%	13%
• I address the nurse if the hand of the fistula arm starts to hurt.	56%	44%	86%	14%	84%	16%
• I compress the puncture site at home if bleeding occurs.	100%	0.0%	100%	0.0%	100%	0.0%
• I address the nurse when I get a headache and chest pain during hemodialysis.	86%	14%	100%	0.0%	100%	0.0%
• I address the nurse when I have cramps during hemodialysis.	92%	8%	100%	0.0%	100%	0.0%
Self-care 2—Self-care in prevention of complications						
• I avoid places with different temperatures.	34%	66%	78%	22%	75%	25%
• I check for signs of redness and swelling at the puncture sites.	74%	26%	100%	0.0%	100%	0.0%
• I immediately go to a hospital or a clinic if the fistula has no thrill.	89%	11%	100%	0.0%	100%	0.0%
• I check every day for changes in the color of the hand of the fistula arm.	43%	57%	100%	0.0%	100%	0.0%
• I allow blood sampling in the fistula arm.*	100%	0.0%	100%	0.0%	100%	0.0%
• I protect the fistula arm from scratches, cuts and wounds.	65%	35%	97%	3%	87%	13%
• I apply ointment when hematoma occurs	54%	46%	100%	0.0%	96%	4%
• I feel the thrill at the fistula site twice a day.	35%	65%	100%	0.0%	92%	8%
• I compress the puncture sites with my fingers (hemostasis).	100%	0.0%	100%	0.0%	100%	0.0%
• I check every day if the hand of the fistula arm cools	72%	28%	100%	0.0%	89%	11%

*Reversed item

Figure (2): Overall patients' self-care practices pre, immediately post and 6 months post implementation of nursing intervention guidelines. (N=160)

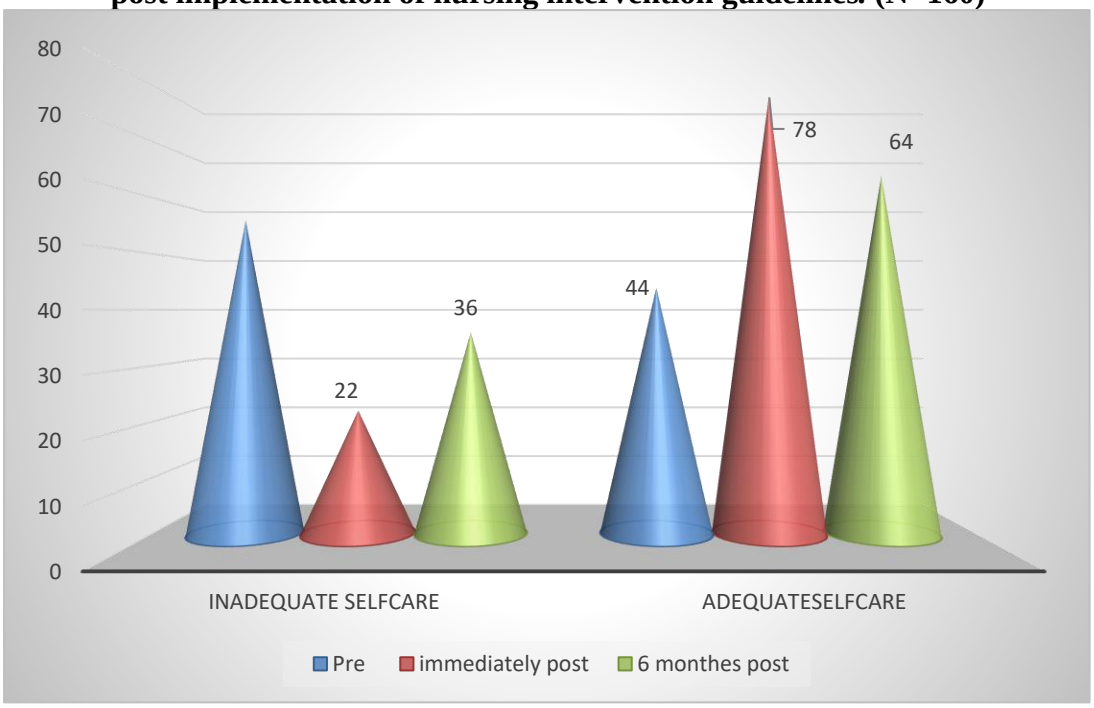

Figure (3): Overall patients' health-related quality of life (KDQOL-SF36) pre, and 6 months post implementation of nursing intervention guidelines. (N=160)

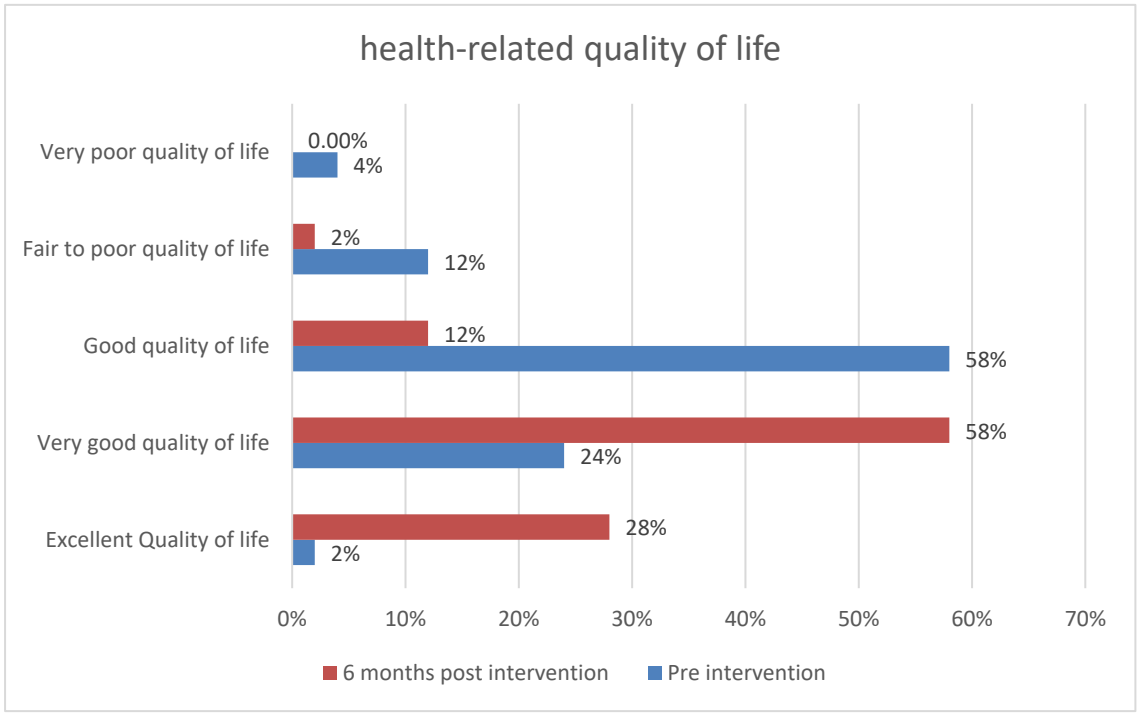

Table (7): The relation between overall level of knowledge and self-care practices in studied patients pre and post implementation of nursing intervention guidelines (n=160)

Overall level of knowledge	Overall self-care practices						P-value
	Pre interventions		Immediate post interventions		6 months post interventions		
	Inadequate	Adequate	Inadequate	Adequate	Inadequate	Adequate	
Satisfactory	15	10	12	74	26	56	0.001**
Unsatisfactory	41	34	10	4	10	8	0.001**

**p<0.001 is highly significant

3. Discussion:

Chronic kidney disease (CKD) is a global health problem. According to the World Health Organization, diseases of the kidney and urinary tract, it represents a global problem with approximately 850,000 deaths every year and more than 115 million disability-adjusted life yearly **(Zedan et al., 2022).** Patients on hemodialysis strive greatly with self-care, it is necessary for improving self-care practices. So, teaching the patients can help to improve self-care practices, and awareness of disease. The arteriovenous fistula (AVF) is considered the most common access for hemodialysis therapy, as it has longer stability, allows a safe and continuous vascular system approach, and is associated with decreased complications. To decrease complication rates with AVF, hemodialysis patients should perform self-care practice guidelines to maintain proper access, minimize infection, and to improve the quality of life **(Mohamed et al., 2023& Pessoa et al., 2020).**

The finding of the current study showed that, as **regards characteristics of the study** subjects, the mean age of studied patients was 42±3.98. It is observed that chronic kidney disease affects not only the elderly, who were considered as risk group, but also middle-aged people. This may be interpreted by, the age-related decline in glomerular filtration rate (GFR) is considered a physiological process after 30–40 years of age. With normal aging, nephron loss occurs and is detectable to some extent by the age-related decrease in GFR. Additionally, as people age, their glomerular filtration rate gradually declines, falling by 25% by the age of 40. The study finding was in contrast with **Abdel Monem et al. (2022)**, revealed that the mean age of studied patients was 52.32±10.92. Regarding gender more than half of studied patients were males. Gender may also have an impact on the occurrence of ESRF **(Mohamed et al., 2023).** Most studied patients were married and smokers. This may be related to the lifestyle of most men (smoking and occupation). Smoking can increase the risk of chronic kidney disease through pro-inflammatory state, oxidative stress, glomerulosclerosis, and tubular atrophy.

Regarding clinical data, our study finding showed that about one quarter of studied patients suffer from diabetes mellitus, this may be due to, that diabetes mellitus lead to damage of blood vessels in the kidneys and over time lead to diabetic nephropathy, which slowly damages the kidneys' filtering system causing end stage renal disease. This result supported by **Hafez et al. (2019)**, found that one fifth of the studied patients had diabetes mellitus as a risk factors of ESRD. In addition to, less than half of them was on hemodialysis more than 5 years, and more than half of them connected with AV shunt first time. The previous finding explained the high needs for education for these patients to prevent complications especially in chronic disease and continuous hemodialysis. The previous finding was supported with **Yang et al. (2019)**, clarified that the level of self-care practices and knowledge need to be improved in hemodialysis patients. Nurses should give specific teaching to improve the patient's self-care practices.

Concerning patients' level of knowledge, this study mentioned that there was a highly statistically significant differences in the study subject's level of knowledge regarding diet and fluid regimen, and vascular access care pre, immediately post, and 6 months post implementation of nursing intervention guidelines, the majority of the studied patients had a satisfactory level of knowledge immediately post nursing intervention guidelines, and there was a slightly decrease 6 months post implementation of nursing intervention guidelines . This may be attributable to the importance of educational interventions for enhancing knowledge, and from the researchers' point of view the rational of decrease in the level of knowledge of patient 6 months post interventions, because patients miss some information by time, so the patients' need continuous refreshing of information especially they had chronic illness and risky for complications. Our study finding was in the same line with **Ahmed et al. (2021),** revealed that, there was a significantly increased total score of satisfactory level of knowledge about hemodialysis post implementing the teaching program.

As regards patient's self-care practices, this study found that there was a highly statistically significant improvement in all aspects of diet and fluid intake at home, wight follow up home, controlling of fluid intake, respected types of fluids, number of meals/day, follow at home after sessions, and way of cooking foods containing potassium pre, immediately post, and 6 months post implementation of nursing intervention guidelines. Additionally, for patient self-care practices for medication at home. The current study mentioned that there was a highly statistically significant improvement in taking prescribed medication dose, dealing with itching, and low blood pressure in pre, immediately post, and 6 months post implementation of nursing intervention guidelines. The previous finding was in the same line with **Whdan et al. (2019)**, found that there was a highly statistically significant improvement in self-care practice at home in taking prescribed medication dose, dealing with itching, and in low blood pressure.

For patient level of self-care practices for vascular access at home (ASBHD-AV scale). The finding of this study showed that, in the pre implementation of nursing intervention guidelines, all patient performed vascular access care correctly in 3 items only, including compression the puncture site at home if bleeding occurs, didn't allow blood sample in the fistula arm, and compressed the puncture site with fingers. While post implementation of nursing intervention guidelines, all patient performed vascular access care correctly in 11 items, including compression the puncture site at home if bleeding occurs, address to the nurse there is a headache, chest pain, cramps during hemodialysis, checked signs of redness and swelling at the puncture site, immediately go to hospital if the fistula has no thrill, check every day the color of fistula, didn't allow blood sample in the fistula arm, applied ointment if the hematoma occurs, feel the thrill at the fistula site twice a day, compression on the puncture site with finger, and check every day the temperature of arm fistula. The previous finding was in coherence with **Whdan et al. (2019),** mentioned that there was a highly statistically significant improvement post program implementation in self-care practices regrading medication home, fluid intake, diet, care of vascular access and arm exercises.

Regarding total level of self-care practices, this study clarified that, around three quarters of studied patients had improvement in their self-care practices immediately post implementation of nursing intervention guidelines and less than two thirds of them had improvement in their self-care practices 6 months post implementation of nursing intervention guidelines. The previous finding was in the same line with **Hamza et al. (2021),** revealed that, more than two thirds of the studied patients had total inadequate self-care behaviors score pre intervention implementation, but this percentage improved to total adequate of less than three quarters of them post intervention implementation. **Ramezani et al. (2019)** confirmed that,

there was a statistically significant difference after implementing the nursing teaching program as regards self-care practices about hemodialysis, and it was successful in improving self-care practices of patients.

Concerning total patient quality of life (KDQOL-SF36). The finding of the current study showed that, more than half studied patients gained very good quality of life 6 months post implementation of nursing intervention guidelines compared with less then quarter of studied patients in pre implementation of nursing intervention guidelines. and more than one quarter of studied patients gained excellent quality of life 6 months post implementation of nursing intervention guidelines, compared with very minimal patients pre implementation of nursing intervention guidelines. The interpretation of the previous finding may be due to the effect of the nursing intervention guidelines, which reflected on improving the quality of patients for hemodialysis patients. The pervious finding was consistent with Bakarman et al. (2019) in his study to evaluate the effect of an educational program on quality of life in patients undergoing hemodialysis in western Saudi Arabia, mentioned that empowerment of education programs and counseling of HD patients leads to a clinically and statistically significant improvement. These programs improve general health, and total HRQOL score.

Regarding the relation between total level of knowledge improvement and total level of self-care practice, the finding of current study showed that, there was a highly statistically significant relation between them (P> 0.001). The previous finding with supported by **Gela and Mengistu (2018),** revealed that there was a statistically significant relation between level of knowledge and self-management. This result may be related to the nature that the patient becomes more knowledge about his disease and self-care practices.

5. Conclusion

Based on the findings of the current study, it can be concluded that, application of nursing interventions guidelines for patients on maintenance hemodialysis reflected a highly statistically significant impact on patients' knowledge level, self-care practices and quality of life. Patients showed improvement in all of their total scores of knowledge level, self-care practices and quality of life post implementation of the nursing interventions guidelines compared with pre interventions.

6. Recommendations

Based upon the results of the current study, the following recommendations are suggested:

- Educational sessions by health care professionals in the haemodialysis department about the self care practices for vascular access is required.
- Hemodialysis nurses should receive periodic in-service training programs to update and improve their awareness about self-care practices regarding vascular access.
- A simplified illustrated and comprehensive brochure and posters including vascular access self-care practices guidelines should be available at health care settings and provided for patients on maintenance hemodialysis.
- Replication of the current research on a larger statistical sample size drawn from various geographical areas and with a long-term follow-up is recommended to obtain more generalizable results.

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الملخص العربى

تأثير ارشادات التدخلات التمريضيه على ممارسات العنايه الذاتية للوصله الشريانيه الوريديه وجودة الحياة لدي مرضي الغسيل الكلوى

مقدمه: مرض الكلى المزمن (CKD) هو مشكلة صحية عامة في جميع أنحاء العالم .وعندما يتطور إلى المرحلة النهائية من مرض الكلى، يتم علاج المريض عن طريق الغسيل الكلوى. ويعد تحسين مستوى ممارسة الرعاية الذاتية وجودة الحياة بين مرضى الغسيل الكلوى هو وسيلة ناجحة للحد من حدوث المضاعفات والوفيات.

الهدف: تهدف الدراسة إلى تقييم تأثير ارشادات التدخلات التمريضيه على ممارسات العنايه الذاتية للوصله الشريانيه الوريديه وجودة الحياة لدي مرضي الغسيل الكلوى.

التصميم: تم استخدام تصميم البحث شبه التجريبي. أجريت الدراسة في قسم الغسيل الكلوى بالمستشفى الجامعي التابع لجامعة القاهرة. وتم اختيار عينة مناسبة من 160 مريضاً بالغاً من الذكور والإناث على الغسيل الكلوى. و تم استخدام ثلاث أدوات لجمع البيانات؛ الأداة الأولى: استبيان مقابلة منظم لمرضى الوصله الشريانيه الوريديه تتكون هذه الأداة من ثلاثة أجزاء، الجزء الاول: الخصائص الديموغرافية الاجتماعية للمريض، الجزء الثاني: البيانات السريريه للمريض، والجزء الثالث: مستوى معرفة مرضى الوصله الشريانيه الوريديه (الاختبار القبلي والبعدي). الأداة الثانية: مقياس ممارسات العنايه الذاتية للوصله الشريانيه الوريديه لدى مرضى الغسيل الكلوى (ASBHD-AVF)، والأداة الثالثة: أمراض الكلى وجودة الحياة (KDQOL-SF36).

النتائج: كان هناك فروق ذات دلالة إحصائية عالية في مستوي معرفة المريض وممارسات العنايه الذاتية قبل ومباشرة بعد، وبعد 6 أشهر من تنفيذ إرشادات التدخلات التمريضيه (P> 0.001) مما كشف عن تحسن في أداء موضوع الدراسة. ويتمتع أكثر من نصف عينة الدراسة 58% بنوعية حياة جيده جدا بعد تنفيذ إرشادات التدخلات التمريضيه.

الخلاصه والتوصيات: خلصت نتائج الدراسة إلى أن مرضى غسيل الكلى الذين تلقوا إرشادات تمريضيه قد تحسنوا في ممارسات العنايه الذاتية وجودة الحياة. واوصت الدراسه بضرورة عقد جلسات تثقيفية من قبل المتخصصين في الرعاية الصحية في قسم الغسيل الكلوى حول ممارسات الرعاية الذاتية للوصله الشريانيه الوريديه.