

Effect of Implementing A Health Education Program For Nurses on Satisfaction Level of Patients Undergoing Hemodialysis

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Abstract: Educational program creativities need to be enhanced periodically to ensure sustainability of their positive effects on patient satisfaction level. **Design:** A quasi-experimental design was utilized in this study. **Objective:** to determine the effect of implementing a health education program for nurses on satisfaction level of patients undergoing hemodialysis. **Setting:** This study was conducted in two different settings hemodialysis units at Beni-Suef, Egypt. **Subjects:** A convenience sample including all available nurses (30). Sixteen (16) nurses are working in University Hospital and 14 nurses at the Health Insurance Hospital, a convenience sixty patients were also included. **Tools:** three tools were used for data collection. **Tool one:** "Hemodialysis nurses' knowledge Structured Interview schedule" **Tool Two:** "Hemodialysis Observational checklist". **Tool Three:** "Hemodialysis patients' satisfaction with nursing care structured interview schedule". **Results:** They imply statistically significant differences (0.001*) between patients' satisfaction and all aspects of nursing care in hemodialysis units which was higher in immediate post and during follow up. **Recommendations:** More efforts in evolving and applying similar educational programs for nurses and patients undergoing hemodialysis.

Keywords: Health Education Program, Satisfaction, Hemodialysis patients & Nurses.

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I. Introduction

Chronic renal failure (CRF) is a progressive, irreversible deterioration in renal function in which the body's ability to maintain metabolic, fluid and electrolyte balance fails, resulting in uremia or azotemia^(1,2). The stages of chronic kidney disease are defined by the level of glomerular filtration rate (GFR), with higher stages representing lower GFR levels. End stage renal disease (ESRD) occurs when GFR is less than 15 ml/min⁽³⁾. The standard management of ESRD is either dialysis or kidney transplantation⁽⁴⁾.

In developing country like Egypt, where limited diagnostic facilities and limited primary health care, ESRD is probably the "tip of the iceberg" as patients are diagnosed with renal disease when they have already reached the end-stage renal failure⁽⁵⁾. The estimated worldwide annual incidence of CRF is around 74 per million, and there are 90,000 patients die each year because of CRF^(6,7). According to the most recent Egyptian renal registry, the prevalence of CRF is 483 per million populations and the total recorded number of CRF patients on dialysis is 40000. The majority of them (98%) were receiving hemodialysis management, while a minority (2%) was treated by peritoneal dialysis^(8,9,10).

Recently, needs of patients undergoing HD have become more complicated^(11,12). Nurses must acquire and implement required competencies and collaboration in order to deliver high-quality care. Nurses working in HD units are called to broaden their scope of practices and to master skills and knowledge through continuous health education programs^(13,14).

Hemodialysis nurses need innovative health education program to be consistent with the core values of caring, integrity, diversity, and excellence. The health education program for HD nurses provides an environment for enrichment and professional growth. Innovative educational programs are vital to provide them with opportunities for lifelong learning. To prepare a more educated and diverse workforce, HD nurse educators and clinical practice partners must work together to create new models of progression that change HD nurse role to advanced degrees that is more efficiently and with less cost^(14,15).

High quality nursing care can decrease patients' feelings of helplessness, increase their action ability, and raise their satisfaction⁽¹⁶⁾. Patient satisfaction is a subjective concept and is measured by the patients' perceptions, expectations and previous experiences with hospital personnel or the healthcare organization⁽¹⁷⁾. It is an important indicator of the quality and efficiency of healthcare systems⁽¹⁸⁻¹⁹⁾. Patient satisfaction with

nursing care is the degree of convergence between the patients' expectations of ideal care and their perception of the care they actually receive⁽²⁰⁾. It is the nurses' legal and ethical obligation to evaluate patient satisfaction and undertake prompt actions to raise its levels⁽²¹⁻²²⁾.

Significance of the study:

The twenty seventh annual report of The Egyptian Society of Nephrology (2010)⁽²³⁾ reported that patients with CKD who require hemodialysis in governmental, health insurance and private hospitals were 44 000 patients. According to The Central Agency for Public Mobilization and Statistics, the number of patients with CKD and dialysis in public and central hospitals was 37 284 patients⁽²⁴⁾. Perceived patients' dissatisfaction and lack of training courses and continuous in-service education program for hemodialysis nurses at the study settings (Upper Egypt) also necessitates this study.

Aim of the study was to determine the effect of implementing a health education program for nurses on satisfaction level of patients undergoing hemodialysis.

Research hypothesis:

The researchers hypothesize that, an improvement in the nurses' knowledge & performance will positively affect the satisfaction level of patients undergoing hemodialysis after implementation of the nursing education program.

II. Materials And Method

Materials

Research design: a quasi-experimental design was utilized in this study.

Setting: this study was conducted in two different settings (the hemodialysis units of the university hospital and the Health Insurance Hospital) at Beni-Suef City, Egypt.

Subjects:

1. A convenience sample including all available nurses (30). Sixteen (16) nurses were working in University Hospital, which included twelve beds in two rooms, and 14 nurses at the Health Insurance Hospital, which include twenty-four beds in three rooms.
2. A convenience 60 patients were also included. Thirty adult patients and thirty pediatric patients were selected according to the following criteria: alert, on hemodialysis for at least 6 months, more than 10 years of age and able to communicate & participate in the current study.

-The sample size was calculated using the following formula⁽²⁵⁾.

N

$$n = \frac{1 + N(e)^2}{e^2}$$

Where: n = sample size, N = patients (106), e = margin error (0.05).

Tools of data collection:

In order to fulfill the aim of the present study, three tools were used for data collection.

Tool 1: "Hemodialysis nurses' knowledge Structured Interview schedule".

It was constructed by the researchers after reviewing related literature^(26,27,28,29,30,31) to assess the following parts:

Part I: demographic characteristics of nurses (age, educational level, occupation and years of experience). **Part II:** hemodialysis nurses' knowledge (anatomy and physiology of urinary system, most common diseases of urinary system, definition of acute and chronic renal failure, causes, clinical manifestation, diagnostic tests, treatment methods, preventing methods and complication of renal failure). **Part III:** nurses' knowledge regarding definition, types, and hemodialysis procedures/methods, hemodialysis requirements/equipment in both adult & pediatric patients.

Tool II: "Hemodialysis Observational checklist". It was modified⁽³²⁾ by the researchers to observe the actual nursing skills for hemodialysis patient pre, during and post dialysis procedure and methods of preventing infection. It included the following items:

Physical care: It included (68) items:

A- Physical assessment:

- Measurement of vital signs before, during and after hemodialysis session.
- Body weight before and after hemodialysis session.
- Checks for laboratory investigations as urea, creatinine, CBC, Na, K and Ca before hemodialysis session and obtains immunization history for hepatitis B, influenza, and pneumococcus.

Assessment of all body systems:

- Cardiovascular system including auscultation of heart sounds, and presence of chest pain and examination of extremities for edema.
- Respiratory system including auscultation of breathing sounds and presence of dyspnea and cough.
- Gastrointestinal system including presence of nausea, vomiting, anorexia, diarrhea, constipation and abdominal distention.
- Urinary system including amount of urine output per day, and presence of dysuria, nocturnal and urgency.
- Musculoskeletal system including presence of muscle cramps or loss of muscle strength.
- Integumentary systems including presence of pruritus and skin dryness.
- Reproductive system including presence of decreased libido and inability to enjoy with sex.

B- Vascular access care:

- Patency through palpation of vascular access and distal pulse, and observing capillary refill.
- Signs and symptoms of infection.
- Signs and symptoms of impaired circulation.
- Observes for any bleeding during the hemodialysis session.

C- Medication administration:

- Administration of prescribed medications according to their prescribed time and explanation of drugs' action and purpose before its administration.
- Clarification about effect and importance of taking medications for patient who refused to take them, then physician notification was also checked.

D- Maintaining patient safety:

- The nurses wear clean gloves when touching the vascular access and disinfect it before needles insertion.
- The nurse keeps contaminated items away from the patient and discards them in a water leakage-proof container.
- The nurse asks and observes the workers to keep the floor clean and dry from any poured or spilled fluids and instructs the patient to avoid immediate standing after hemodialysis session.

E- Prevention and management of complications:

- Hypotension, muscle cramps, headache, arrhythmia and chest pain, and bloodline separation.

II- Psychological care:It included (24) items:

A- Trustful confidential relationship:

- It is comprised accurate and right information to the patient and keeping patient's information confidential and never shares it with others.
- Moreover, patient feels comfort and has the desire to speak with the nurse about any problem facing him.

B- Using a Therapeutic communication technique:

- Nurses have a pleasant tone of voice and show empathetic facial expression. Moreover, show interest in patient's problems and help him to find solutions.
- Listening to what patient says.
- Giving the patient enough time to speak without interrupting him and answer questions.
- Asking the patient to repeat his speech when the nurse does not understand it.

C- Dealing with patient anxiety:

- It included staying enough time with the patient when he is anxious and encouraging him to express his feelings. Moreover, explaining any procedure to the patient before performing it, answering all patients' questions clearly, and avoid speaking English or using medical terminologies in front of him. In addition, teaching the patient relaxation technique as deep breathing exercise.

D- Acceptance of patient:

- Assess patients' satisfaction related to nurses' judging on or criticizing patient's behavior or speech, valuing patient's feelings and what he says, listening to the patient even if the nurse disagrees with him and treating all patients at the same manner.

E- Humanity of care:

- It included dealing with the patient with respect and politeness, calling the patient with his name or position

and keeping patient's privacy as applying curtains while performing any procedure for him.

III- Social care:It included (8) items:

A- Orientation about place, time and persons:

- It included assessing patients' satisfaction related to the nurse introducing herself and her position to the patient when she deals with him for the first time, orientation about the physical setting of the hemodialysis unit and shifts (morning, afternoon and night shift) starting time and duration of each shift.

B- Social contact and interactions:

- It included encouraging the patient to initiate and maintain social interaction with others (family members, friends and patients) and allowing visits from family members and friends during the hemodialysis session according to unit policy. Moreover, allowing the patient to receive or perform telephone calls during the hemodialysis session.

C- Referral to social support resources as:

- Evaluate patients' satisfaction regarding referral to vocational rehabilitation centers when the patient has a difficulty to hold a job. In addition, assessment of referral to the nonprofit social support organizations if patient has a financial problem.

IV- Spiritual care:It included (4) item:

A- Meeting spiritual needs:

- It included helping the patient to pray during the hemodialysis session and allowing the patient to read spiritual books during the hemodialysis session.

B- Dealing with spiritual distress:

- It included instructing the patient to accept his illness as a test of faith and not as a punishment from Allah. Moreover, referral to religious men if the patient has a feeling of guilt, hopelessness, helplessness and sever anger.

V- Nursing health teaching:It included (28) items:

A- Dietary and fluid intake:

- It included instructing the patient about allowed amount of fluid intake, taking high protein, low salt and low fat diet. Moreover, instructing the patient to reduce intake of potassium and phosphorus containing foods.

B- Exercise:

- It included instructing the patient about exercise importance for regulation of body weight and blood pressure. Moreover, instructing the patient to perform hand exercise to strengthen the vascular access and to walk for half an-hour daily.

C- Vascular access care:

- It included instructing the patient to keep the vascular access site clean, avoidwearing any constrictive clothes or jewelry on the extremity with vascular access and avoid using it for measuring blood pressure, obtaining blood samples, or administering I.V medications.
- In addition, avoid using the arm with vascular access to carry heavy objects, avoid sleeping on it and avoid using any creams or lotions on the vascular access site. Moreover, the nurse instructs the patient to observe the vascular access site for signs of infection as redness, hotness, swelling and tenderness, and monitor for any bleeding from the vascular access site after the hemodialysis session.

D- Skin care:

- It included instructing the patient to avoid using of high chemical products as soap with chemicals and perfumes on the skin, take frequent showers, apply lotion frequently to dry skin for reducing itching and cut his fingernails to prevent scratching the skin.

E- Medications:

- It included instructing the patient about action, dose, frequency and side effects of prescribed medications and having a list of medications (name, dose, frequency) prior to hospitalization. In addition, instructing the patient about the importance of compliance with the prescribed medications to prevent any complications and hold antihypertensive medication dose prior to hemodialysis session.

F- Follow up schedule:

- It included instructing the patient to perform blood tests as CBC, Urea, Creatinine, serum Ca, Na, K at least once monthly, do viral markers every three months and follow his hemodialysis sessions schedule.

Tool III: "Hemodialysis patients' satisfaction with nursing care structured interview schedule". This tool was developed by the researchers, based on reviewing the recent related literature^(33,34,35,36,37) to identify patients' level of satisfaction with nursing care provided in hemodialysis units. It comprised two parts: **Part I:** demographic characteristic and medical data of patients (age, sex education, occupation, area of residence, marital status, income level and medical history of the patients included previous hospitalization, and its causes, associated chronic diseases, duration of management by hemodialysis, number and duration of hemodialysis sessions per week and hospital name). **Part II: data related to hemodialysis patients' satisfaction with different aspects nursing care** (physical care, psychological care, social care, spiritual care, nursing health teaching).

Scoring system:

- In relation to **nurses' knowledge**, answers were scored on a 3 points scale; a score of 3 is considered correct & complete, 2 is considered correct but incomplete while 1 score for wrong answer. Nurse's knowledge more than 80% was considered satisfactory, less than 80% was considered unsatisfactory level of knowledge.
- **Nurses' practices** were 33 items; each was assigned a score of either one (done item) or two (not done).
 - The total score of nurses practices were summed up accordingly, more than 85% was considered competent, less than 85% was considered incompetent

Hemodialysis patients' satisfaction Likert scale: Every patient expressed his/her response for statements about different aspects of nursing care on a (3) points Likert scale ranging from strongly agree (3 score), agree (2 score) and disagree (1 score). Strongly agree means highly satisfied, agree means satisfied and disagree means dissatisfied. The total score was summed and transformed to percentage. After that, the patients' responses were categorized into highly satisfied, satisfied and dissatisfied as follows: **Highly satisfied:** equal to or more than 80% of total score of patient's responses. **Satisfied:** equal to, or more than 60% to less than 80% of total score of patient's responses. **Dissatisfied:** less than 60% of total score of patient's responses⁽³⁸⁾.

METHOD

1. An official permission to carry out the study was obtained from the hospitals' directors at the selected settings, after explaining the aim of the study.
2. An ethical approval was taken from the ethics committee of faculty of Beni-Suef
3. Tool I: was developed and translated to Arabic language and used by the researchers.
4. **Validity:** Data collection tools were developed by the researchers after extensive review of related recent literature. Tools were submitted to a panel of five experts in the both fields of pediatric and adult nursing to test the content validity. Modifications of the tools were done according to the panel judgment on clarity of sentences, appropriateness of content and sequence of items.
5. Reliability test was done using Cronbach's test (R=0.81)
6. A pilot study was conducted on five nurses to test clarity, feasibility of the tools, and the necessary modification were done accordingly.
7. Both tools I&II were used for the studied nurses (except part one of tool one) for three times: before implementing the educational program (as baseline level), immediately after conducting the educational program and one month thereafter to test the effect and retention of the both knowledge and skills that gained by them.
8. Tool III was used for both adult & pediatric studied patients three times: before implementing the educational program for nurses, immediately after conducting the educational program and a month thereafter to test the effect of both changed knowledge and skills of nurses on patients' satisfaction level.
9. **Educational program:** It was tested for content validity by five experts in the field of Medical Surgical Nursing and Pediatric nursing (University of Alexandria and Beni-Suef). Accordingly, omission, correction and clarification of some items were done. The educational program was carried out in the following **four phases:**

Assessment phase: It was carried out using tool I&II to collect baseline data and to identify nurses' knowledge/skills needs.

Planning phase: educational program was designed based on assessment phase and recent review of literature⁽³⁰⁻³¹⁾. It included goals & contents.

Implementation Phase: the program was conducted through five sessions; each was between 30-60 minutes according to the nurses' needs and condition in groups. Each session was started by a summary about what has been discussed in the previous one and presenting the objectives of the new session, using simple Arabic language, also the session finished by a summary of its content and feedback was gained to ensure that they got the maximum benefit.

The total number of the subjects was 30 nurses; they were divided into 6 groups (5 members in each). The program was presented to each group separately.

- The used teaching methods were discussions, brainstorming, demonstration and re-demonstration. Handouts of the educational program were given to the studied subjects as teaching media.
 - **First session contents:** aim of the program, anatomy and physiology of urinary system and kidney, definition of renal failure, types of renal failure and prevention methods of renal failure.
 - **Second session contents:** monitoring the previous information and answering the queries of nursing staff members, definition, causes, clinical manifestation, diagnostic tests, preventing methods and treatment of acute renal failure.
 - **Third session contents:** monitoring the previous information and answering the queries of nursing staff members, definition, types, and hemodialysis procedures/methods, hemodialysis requirements/equipment in both adult & pediatric patients.
 - **Fourth session contents:** monitoring the previous information and answering the queries of nursing staff members, health education given to the patient, methods of infection control , common types of diseases related to the process of hemorrhage & ways to reduce these infection, general standard precautions, blood cleaning machines and composition of the blood tubes
 - **Fifth session contents:** monitoring the previous information and answering the queries of nursing staff members, preservation of the environment inside the blood sanatorium, treating blood spills and other fluids, microbiological examination of the samples, treatment of water used in the procedure of the bleeding, workers in blood units, integrated nursing care for patients with bleeding
- Evaluation phase:** The effect of the program on study subjects was carried through comparing the pre and post assessment score of nurses` knowledge & performance.

Ethical considerations: the aim of the study was explained to the nurses who participated in the research before applying the tools to gain confidence and trust. A written consent was obtained from each subject participating in the program, informing them that they have the right to withdraw at any time. The study was conducted in a suitable place for nurses. Data were collected and treated confidentially.

Statistical Data Analysis

The data were analyzed using the statistical package for social science (SPSS), version 16.0. Data were presented using: descriptive statistics in the form of number, percentage and standard deviation. Chi-square (χ^2) & (f) test for analysis of qualitative variables were used. Statistical significance was considered when P value <0.001

III. Result

Table (1) Percentage distribution of nurses regarding their socio-demographic characteristics (No=30)

	Frequency	%
Age in years		
Less than 20	5	16.7
20-	6	20.0
25-	14	46.6
≥30	5	16.7
Mean ±SD	28.7±11.3	
Educational qualification		
Secondary nursing education	15	50.0
Secondary and technical nursing education	12	40.0
Baccalaureate of nursing	3	10.0
Marital Status		
Single	6	20.0
Married	24	80.0
Years of experience		
Less than one year	5	16.7
1-	6	20.0
5-	19	63.3
Training courses		
Yes	8	26.7
No	22	73.3

Table (1) the socio demographic characteristics of nurses indicated that, 46.6% of the studied nurses' age ranged between 25-30 years with mean age **28.7±11.3** years. Regarding the hemodialysis nurses' level of education, half (50.0%) of the nurses had secondary nursing education. As regards of marital status, this table showed that more than three quarters (80%) were married. In addition, this table also showed that 63.3% and 73.3% of them have more than 5 years of experience and do not take any training courses respectively.

Table(2): Distribution of demographic characteristics of the studied patients (No=60).

	No	%
Age in years		
10-20	30	50.0
20-30	8	13.3
30-40	10	16.7
40-50	12	20.0
Mean ±SD	12,35±1.78	
Sex		
Male	22	36.6
Female	38	63.4
Educational level		
Illiterate	20	33.3
Primary	15	25.0
Secondary	20	33.3
University	5	8.4
Residence		
Urban	3	5.0
Rural	57	95.0
Marital Status		
Single	22	36.6
Married	32	53.3
Divorced	4	6.7
Widow	2	3.4
Occupation		
Employed	23	38.3
Unemployed	37	61.7
Income		
Enough	15	25.0
Not Enough	45	75.0

Table (2): The socio demographic characteristics of patients indicated that, 50.0% of the studied patient age ranged between 10-20 years with mean age 12, 35±1.78 years. Regarding sex, it was noticed that, females represented higher percentage 63.4 %. According to hemodialysis patient level of education, 33.3% of them were illiterate and secondary educational level. This table also explained that almost all (95%) patient were from rural community. More than half of patients (53.3%) were married. This table also displays that more than half (61.7%) and 75.0% of them were not working and had insufficient income respectively.

Table (3): Distribution of the studied patients according to their medical data (n= 60)

Medical data	No. (60)	%
Previous hospitalization		
No	20	33.3
Yes	40	66.7
Reason of patient hospitalization? (n = 85)		
Cardiovascular & pulmonary disorders	13	21.7
Renal disorders	20	33.3
Endocrine disorders	3	5.0
Surgical procedures	6	10.0
Cerebrovascular disorders, road traffic accident	4	6.7
Fever	14	23.3
Associated chronic diseases		
None	9	15.0
Cardiac Disease	11	18.3
Hypertension	20	33.3
Diabetes Mellitus	16	26.8
Cancer	2	3.3
Others (hepatitis & rheumatoid arthritis)	2	3.3
When did you start hemodialysis		
>6 months	6	10.0
>1 year	12	20.0
>2 years	15	25.0
> 3 years	27	45.0
Number of hemodialysis sessions per week		
Three sessions	56	93.3
> Three sessions	4	6.7
Number of hemodialysis hours per session		
3 hrs	4	6.7

4 hrs	47	78.3
5 hrs	9	15.0

Table (3): shows the number and percent distribution of the studied patients according to their medical data. It can be noticed that, two-third (66.7%) of the patients had previous hospitalization; the main reasons were 33.3% renal disorders and 33.3% hypertension of associated chronic diseases. In relation to duration of management by HD, it was found that, more than two-fifths (45%) of the patients were undergoing HD since more than three years, and the majority (93.3%) of patients scheduled for HD for three sessions per week. In addition, the majority (78.3%) of patients had four hours/session

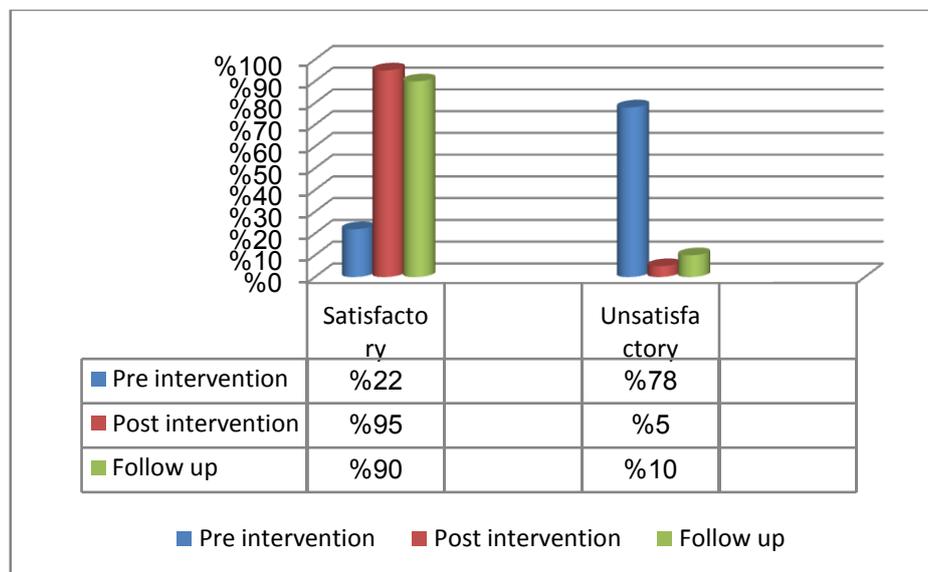


Figure (1): Percentage distribution of total knowledge score of the studied nurses' pre and post phases of intervention. No=30

Figure(1) Showed that78% of the studied nurses had total unsatisfactory response in their scores of knowledgepre-program implementation. It also exhibited that95%and 90% of them had satisfactory level of their scores of knowledge immediately & post follow up (after month) educational program implementation.

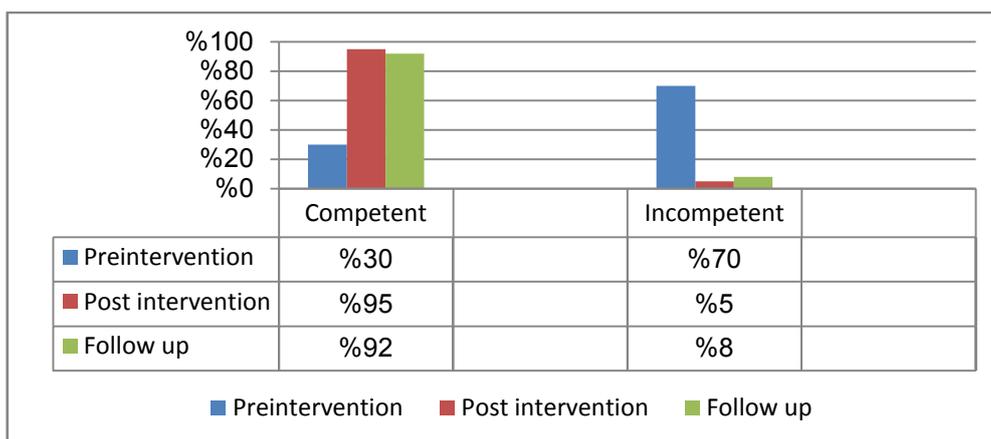


Figure (2): Percentage distribution of total practice score of the studied nurses' pre and post phases of intervention. No=30

Figure(2) revealed that 70% were incompetent in their total scores of practice pre implementing the educational program. It also displayed that the majority of the studied nurses (95% and 92%) were competent in their total scores of practice immediately after implementing the educational program and a month later (follow up) program implementation respectively.

Table (4): Mean percent scores of patients' satisfaction with nursing care in hemodialysis units through program implementation

	Pre	Immediate post	Follow up after a month	F
Total physical care Mean ±SD	0.85+0.75	2.00+0.00	1.97+0.08	<0.001*
Total psychological care	0.06+0.44	1.97+0.16	1.17+1.68	<0.001*
Mean ± SD				
Total social care	0.28+0.53	1.92+0.99	1.82+0.88	<0.001*
Mean ± SD				
Total spiritual care	0.99+0.94	1.42+0.50	1.31+0.20	<0.001*
Mean ± SD				
Total health teaching	.20+4.41	7.78+1.25	2.00+0.00	<0.001*
Mean ± SD				

Table (4): shows mean percent scores of patients' satisfaction with all aspects nursing care in hemodialysis units. This table clarifies that the Mean ± SD of patients' satisfaction with all aspects of nursing care in hemodialysis units was higher in immediate, post and during follow up with statistical significant difference about patients' satisfaction with nursing care where P was (0.001*) in all aspects of nursing care.

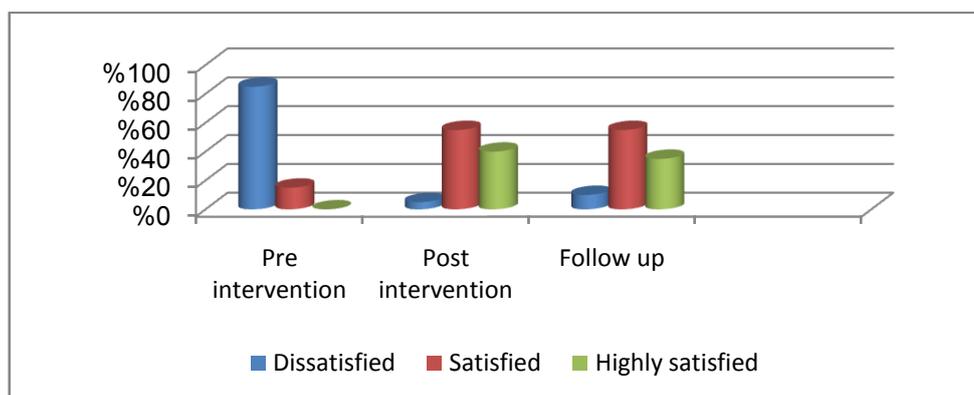


Figure (3): Relations of patients' level of satisfaction with nursing care in hemodialysis units of the program implementation phases No =60

Figure (3) shows that, the majority of HD patients were dissatisfied with nursing care of before implementing the educational program. It additionally clarifies the increased patients' satisfaction level with nursing care in hemodialysis units was in both immediate and during follow up (a month after implementing the educational program for nurses).

Table (5): Correlation between nurses' total knowledge, practice pre/post and follow up educational program regarding hemodialysis and some of their socio-demographic data.

Variables		Age		Educational qualification		Years of experience		Training courses	
		r	p	r	p	r	p	r	P
Knowledge	Pre intervention	0.72	0.005	0.248	0.001	0.377	0.001	0.266	0.001
	Post intervention	0.544	0.001	0.145	0.005	0.246	0.001	0.435	0.001
	Follow up	0.051	0.005	0.364	0.001	0.422	0.001	0.413	0.001
Practice	Pre intervention	0.222	0.001	0.422	0.001	0.272	0.001	0.223	0.001
	Post intervention	0.433	0.001	0.405	0.001	0.463	0.001	0.220	0.001
	Follow up	0.132	0.005	0.245	0.001	0.344	0.001	0.481	0.001

Table (5) shows statistically significant positive correlation between nurses' knowledge scores and their educational qualification, years of experience and training courses at the pre-program phase (P < 0.001).

However, this table shows that there are statistically insignificant positive correlations between practice scores and nurse's age after month of conducting educational program.

IV. Discussion

When hemodialysis has been introduced as an effective workable treatment, the outlook for patients with advancing kidney failure suddenly changed from anticipation of approaching death to indefinite survival. Hemodialysis is stayed the most common form of treatment modality for renal replacement therapy offered in hospital based units⁽³⁹⁾. In Egypt, the prevalence of dialysis patients is presumed to be increasing⁽⁴⁰⁾. Hemodialysis patients require special nursing care⁽⁴¹⁾. Regular assessment of patient satisfaction will be effective in increasing the quality of nursing care through implementation of necessary regulations and modifications in nursing applications in line with patient expectations⁽⁴²⁾.

Regarding the hemodialysis nurses' level of education, the result of the current study showed that; half of the nurses had secondary nursing education. This is in line with Al-Mawsheki⁽²⁷⁾ who asserted that more than half (58%) of studied nurses had diploma of nursing.

As regard of years of experience, results of the current study indicated that more than half (63.3%) of nurses have more than 5 years of experience. This finding is supported by AL-Mawsheki⁽²⁷⁾ who noticed that half of studied nurses had an experience from 1 year to less than 10 years. Also it is in agreement with Bakey⁽⁴³⁾, his study was done on the hemodialysis nurses in Baghdad teaching hospitals; who stated that more than two third of studied nurses had experiences ranged from one year to less than 5 years. These findings contradict with the findings of El-Moghazy⁽⁴⁴⁾ who reported that, less than two third (65%) of nurses had 10 years or more of experience.

With regard to attending training courses the study found that less than three quarter (73.3%) did not take any training courses. This finding was congruent with AL-Mawsheki⁽²⁷⁾ who found that nearly two third of the studied nurses did not attend training course about patients care in the Hemodialysis Unit. This finding is in agreement with Abdelfatah⁽⁴⁵⁾, and Bakey⁽⁴³⁾, who stated that the majority of the studied nurses did not attend the training course about patients care in Hemodialysis Unit. This finding disagrees with Hamed⁽⁴⁶⁾ who found that, more than two third (67%) of nurses in Khartoum State received training in hemodialysis.

In relation to the socio-demographic characteristics of the studied patients, concerning the age of studied patients, the current study showed that, half of them were pediatric patients between 10-20 years old. This finding disagrees with Abd El Hafeez⁽⁴⁷⁾ who reported that about one third of the patients at the hemodialysis units of the Alexandria Main University Hospital were 50 to 60 years. The present result could be rationalized as chronic renal failure is considered one of the disorders growing among all population groups⁽⁴³⁾.

According to sex of the patients, the results of this study showed that less than two thirds were females. This is in line with Abd El Hafeez⁽⁴⁷⁾ who reported that about more than half of the patients were females. It could be justified that increased stressful situation today in females leads to disease as hypertension and diabetes mellitus which provoking CRF⁽⁴⁸⁾. On the other hand, this finding is in contrast with Rabie⁽³²⁾ who showed that more than half of the hemodialysis patients in four different hospitals at Alexandria were males.

Regarding the educational level, the findings of this study showed that illiterate patients and those with secondary educational levels were equal and each one of them was represent one third. This finding agrees with Abd El Hafeez (2010)⁽⁴⁴⁾ and Rabie⁽³²⁾ who reported that about one third of the HD patients had secondary educational level.

In relation to area of residence, this study represented that the majority of patients (95%) lived in rural area. This finding contradicts with EL Shahed et al (2013)⁽⁷⁾ who reported that, around two-thirds of their studied HD patients were living in an urban area.

In relation to occupation, the results showed that 61.7% of patients were unemployed. This result is in agreement with El-Sayed⁽⁴⁹⁾, who found that, most of the studied patients had no work. It could be due to impaired physical status that affected patients' ability to keep job.

In relation to income, the finding of present study revealed that, three quarters of patients didn't have enough income. This finding agrees with Abd El Hafeez⁽⁵⁰⁾ who reported that, more than half of the hemodialysis patients experienced financial problems. That might be because most of patients were unemployed as well as the costly treatment.

Patients' medical data

As regards previous hospitalization, the result of current study exhibit that, two thirds (66.7%) of the patients had previous hospitalization, the **main reason** was renal disorders, which came in accordance with Rabie⁽³²⁾ who found that, HD patients had higher hospitalization rates compared to peritoneal dialysis patients. **Regarding associated chronic diseases**, the result of current study revealed that one third (33.3%) of patients had

hypertension. It might be due to complications of chronic kidney disease and hemodialysis or might be a cause of renal failure.

Nurses' knowledge regarding hemodialysis

Concerning **nurses' knowledge**, the results of the present study showed that the majority of nurses had unsatisfactory knowledge in hemodialysis before implementation of program, which came in accordance with Hassona⁽⁵¹⁾, who stated that most of nurses had unsatisfactory total knowledge regarding hemodialysis. This finding is in contrast with El- Moghazy⁽⁴⁴⁾ and AL-Mawsheki⁽²⁷⁾ who reported that the majority of total nurses had satisfactory knowledge regarding hemodialysis. Also, the present results revealed that there was a highly statistically significant difference between nurses' knowledge before and after receiving a health education program as regards to all knowledge items about hemodialysis in both post-intervention and follow up phases. This could be due to nurses' wishes to refine their knowledge and the ease of the implemented health education program. This finding was supported by Dawood⁽²⁹⁾ who asserted a notable statistical significant difference between nurses' knowledge before and after receiving nursing care training.

Regarding **nurses' practice**, the finding of the present study explained that the majority of nurses were incompetent in their total scores of practice before receiving a health education program compared with (95% and 92%) were competent in their scores of practice level immediate post and follow up program implementation respectively. This finding is consistent with Dawood⁽²⁹⁾ who concluded that there was a statistically significant difference (0.001) between nurses' skills before and after receiving nursing care training.

In relation to **patients' satisfaction** with nursing care, the present study showed that there was an increase in patients' satisfaction level after the implementing a health education program. This could be justified that given a health education program to nurses help patients to improve their confidence satisfaction towards nurses' service. This finding agrees with Ugurlu and Ali⁽⁵²⁾ and Dawood⁽²⁹⁾ who showed an increase in patients' satisfaction level after the application of the protocol of nursing care.

V. Conclusion

Educational intervention had a significant role in increasing satisfaction level of patients undergoing hemodialysis. Generally, the results of this study can be useful in theoretical and practical level. This model for the satisfaction of patients suffering from kidney disease can be presented indicating the operation of the unit dialysis, HD sessions, satisfaction with nursing care and information (physical health, psychological well-being and social relations). Also the results are useful to health-care professionals team, doctors, psychologists, nurses, as well as health services administrators, commended to offer the medical treatment in patients undergoing hemodialysis. For example, the implementation of educational programs for health professionals team employed in a dialysis unit should be optional in relation to issues of communication and support of patients undergoing dialysis.

VI. Recommendations

More efforts in evolving and applying similar educational programs for nurses and patients undergoing hemodialysis, these educational program creativities need to be enhanced periodically to ensure sustainability of their positive effects on satisfaction level.

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