

EFFECTIVENESS OF NURSING EDUCATIONAL PROGRAM ON NURSE'S KNOWLEDGE AND PRACTICE IN HEMODIALYSIS UNITS ⁺

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Abstract

Quasi-experimental study was carried out at the Hemodialysis units in teaching hospitals in Baghdad city which include Al-Yarmouk teaching hospital, Al-Karama teaching hospital, surgical specialist and Al-Kadhmiya teaching hospital. The aim of the study is to determine the effect of education program on nurses' knowledge who practices in hemodialysis units. The sample comprised of (30) nurses were selected purposively and divided equally into study and control groups. The data collected through the use of nurse's knowledge and observation checklist, which were developed for the purpose of the study. Instrument validity was determined through content validity, by a panel of experts. Reliability of the instrument determined through the use of Pearson correlation coefficient was (0.82) for nurses' knowledge and (0.84) for nurses' practices. The analysis of data was performed through the application of descriptive statistics and inferential. The study results reveal that the implementation of educational program has high effect on significant differences between (study and control groups) however, the statistical effect shown in their knowledge and practices was adequately improved and developed. The study concludes that the education program could be considered as an effective mean for improvement of nurse's knowledge and practices. It is recommended that special and long training programs for nurses in Hemodialysis unit and nursing staff should be increased.

المستخلص

أجريت الدراسة شبه التجريبية في وحدات الديليزة الدموية في كل من مستشفى اليرموك التعليمي ومستشفى الكرامة التعليمي ومستشفى الجراحات التخصصية ومستشفى الكاظمية التعليمي. تهدف الدراسة إلى تحديد اثر البرنامج التمريضي التثقيفي في معلومات وممارسات الممرضات / الممرضين العاملين في وحدة الديليزة الدموية. شملت العينة العمدية (٣٠) ممرضة وممرض، قسمت العينة إلى مجموعتين متساويتين، المجموعة الاختبارية والمجموعة الضابطة، وجمعت البيانات الخاصة بالبحث من خلال استخدام استمارة اختبار معلومات الممرضات واستمارة رصد الممارسات، وقد تم بناؤها وتصميمها لأغراض الدراسة وكان معامل الثبات لاستمارة المعلومات (٠,٨٢) ولاستمارة الرصد (٠,٨٤)، أما مصداقية أدوات القياس فقد تحققت من خلال عرضها على مجموعة من الخبراء لغرض مراجعتها وتقويم درجة مصداقيتها.

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وبعد تحليل المعلومات باستخدام الإحصاء الوصفي والإحصاء الاستنتاجي، تم التوصل الى نتائج الدراسة من خلال تطبيق البرنامج التثقيفي وقد وجدت فروق ذات دلالة إحصائية بين المجموعة الاختبارية والتي تبين مقدار التأثير الكبير للبرنامج على تطور معلومات وممارسات الممرضات في المجموعة الاختبارية بعد إجراء المقارنة مع المجموعة الضابطة وذلك من خلال إعادة الاختبار للمجموعتين. وبناءً على استنتاجات البحث أوصت الدراسة بأستحداث برنامج تدريبي خاص للكادر التمريضي العامل في وحدة الدليزة الدموية مع زيادة الكادر التمريضي.

Introduction

Hemodialysis involves the use of a machine to perform the blood purification functions normally performed by the kidneys. The patient's blood is pumped through plastic tubing out of the body and into a dialyzer that filters out and excess water, after which the blood is returned to the body. Typically, end stage renal disease (ESRD) patients require Hemodialysis three times a week, for three to four hours per session[1].

Hemodialysis is one treatment modality and it is relatively safe procedure for patients with kidney failure, so that it is an integral part of a transplant program. It may be necessary to prepare the patient for surgery, maintain him through postoperative oliguria, or sustain his life following transplant failure [2].

Hypovolemia and shock can occur during dialysis as a result of fluid removal from the intra vascular compartment. So, the nurses should maintain a high level of nursing practiced, critical thinking and skill of decision-making, and the nephrology nurses play an important role in preventing and detecting deviation of physical problems that occur during Hemodialysis which are related to hypertension from removal of fluid and disequilibrium from a rapid reduction in extra cellular electrolytes and wastes[3].

Care must be taken to protect vascular access from complication. According to the United States renal data system 1997, the total costs for vascular access complications reached at least \$2 billion in the year 2000. These complications included thrombosis, infection, bleeding and limb ischemia [4].

So the aim of the study is to determine the effect of education program on nurse's knowledge and practices in Hemodialysis units also to find out the relationship between nurse's knowledge and practices and some demographic data.

Methodology

Quasi – Experimental design was conducted on nurses in Hemodialysis unit in Baghdad teaching hospitals (Al-Yarmouk, Al-Karama, Al-Kadhmiya and Surgical Specialist Hospital) from 1st of January 2002 to 15th of November 2003.

The educational program was designed as a result of the nurses' needs assessment. The contents of the program were evaluated by (18) experts in different fields.

The sample of the study consists of (30) nurses' selected purposively, from Hemodialysis units in Baghdad teaching hospitals. This sample is divided into two groups every group consists of (15) nurse exposed to the educational program (study group) and (15) nurses not exposed and considered the control group. The control

group is used as a match to the study group. The two groups have the same demographic characteristics.

The implementation of the education program on the study group involves the following steps:

- 1- Socio-demographic data which are related to the nurse in Hemodialysis unit which included age, years of experience, gender, marital status, educational status and number of training session attended .
- 2- Concerning nurse's knowledge which includes (21) items and nurse's practices (observation checklist) which is divided for 3 parts are containing (64) items (1- Preparation equipment 2-Preparation of dialysis machine and 3- Preparation of the patient from connection and disconnection) checked in their hospital.
- 3- A pre-test format was administered to the nurse in study group after the 20th of April 2002.
- 4- Introducing the educational program to (15) Hemodialysis nurses. This was carried out for period of 4 days (3 days theory and one day practice in their hospitals).
- 5- A post- test format was administered at the end of the session and after 2 week of implementing the program. It took less time than pre test (10 minutes) for knowledge test.
- 6- The same steps were followed with the control group but without implementation of the program. The data collection and pre-test format in the study group was collected in their hospitals after the 20th of April 2002, the post-test was done after 20th of May 2002.

Instrument validity was determined through content validity, by 19 panel of experts. It was obtained by evaluating (10) Hemodialysis nurses according to the observation checklist at the same time with graduated nurses . The reliability coefficient was (0.84) at level of ($P \leq 0.01$) which is statically acceptable.

Test-retest was obtained by evaluating (10) Hemodialysis nurses according to the "knowledge test tool "twice with in 2 weeks persons coefficients of correlation was used. It was (0.82) significant at ($p < 0.01$) level. This means that the format is reliable.

The score used in knowledge and practices items is related to the higher education and divided to poor (0-49), accept (50-59), fair (60-69), good (70-79), very good (80-89) & excellent (90-100).

In order to determine whether the objectives of the study were meet or not , the following two statistical procedures were used in analyzing the data of the study which descriptive data analysis and inferential data analysis.

Results

Table (1) shows that ,demographic data of the sample. In regard to age, the highest percentage (60 %) of nurses in study group while (53 %) in control group were within the age range from (21 - 30) years and lowest percent (13.3 %) of study groups and (6.7 %) percent for control groups with in the age group (< 40). The mean of age for both groups was (30.5) and standard deviation was (6.13).

For the staff nurse's years of experience in Hemodialysis for both groups, the majority of them had experience of (1 – 5) years and they were (46.7 %). The data analysis reveals that (66.7%) of the staff nurses for both groups (study and control) were female and the remaining were males. Relative to their marital status, most of them (study and control groups) (53.3%) were married.

For the educational status, most of them (53.3%) were high institute graduate. All of them (100%) did not attend any training session regarding the knowledge and practice in Hemodialysis units.

Table-(1): Distribution of demographic data in study and control groups.

Variables		Study group		Control group	
		No.	%	No.	%
Age	21_30	9	60	8	53,3
	31_40	4	26,7	6	40
	<40	2	13,3	1	6,7
	Total	10	100	10	100
	Mean 30.5 SD 6,13				
Years of experience	1_5	7	46,7	7	46,7
	6_10	0	33,3	0	33,3
	11_15	3	20,0	3	20,0
	Total	10	100	10	100
Gender	Male	0	33,3	0	33,3
	Female	10	66,7	10	66,7
	Total	10	100	10	100
Marital status	Single	7	46,7	7	46,7
	Married	8	53,3	8	53,3
	Total	10	100	10	100
Educational level	Nursing school	2	13,3	2	13,3
	Nursing secondary school	2	13,3	2	13,3
	Nursing institute	8	53,3	8	53,3
	Nursing college	3	20	3	20
	Total	10	100	10	100
Training coarse	Yes	.	.	.	.
	No	.	.	.	.

Table (2) : Frequencies and percentages of pre and post knowledge score in both study and control groups.

Level of nurses knowledge score	study group				control group			
	pre		post		pre		post	
	N0.	%	N0.	%	N0.	%	N0.	%

poor	•	•	•	•	•	•	•	•
accept	•	٣٣,٣	•	•	٦	٤٠	٤	٢٦,٧
fair	•	٣٣,٣	•	•	٤	٢٦,٦	٦	٤٠
Good	٤	٢٦,٦	•	•	٤	٢٦,٤	٤	٢٦,٦
Very good	١	٦,٦	١	٦,٦	١	٦,٦	١	٦,٦
Excellent	•	•	١٤	٩٣,٤	•	•	•	•
Total	١٥	١٠٠	١٥	١٠٠	١٥	١٠٠	١٥	١٠٠

This table shows that , the score of knowledge study group before program ranged between acceptable (33.3%) and very good (6.6%) while after program the score ranged between very good (6.6%) and excellent (93.4%) , the control group the score of pre test ranged between acceptable (40%) and very good (6.6%), while post test score ranged also between acceptable (26.7%) and very good (6.6%).

Table (3): Frequencies and percentages of pre and post practice score in both study and control groups.

Level of nurses practices score	study group				control group			
	pre		post		pre		post	
	No.	%	No.	%	No.	%	No.	%
Poor	•	•	•	•	•	•	•	•
Accept	•	•	•	•	•	•	•	•
Fair	•	•	•	•	•	•	•	•
Good	٧	٤٦,٧	•	•	٩	٦٠	٩	٦٠
Very good	٨	٥٣,٣	١	٦,٧	٦	٤٠	٦	٤٠
Excellent	•	•	١٤	٩٣,٣	•	•	•	•
Total	١٥	١٠٠	١٥	١٠٠	١٥	١٠٠	١٥	١٠٠

The score of practice before program ranged between good (46.7%) and very good (53.3%) but after program the score ranged between very good (6.7%) and excellent (93.3%) while the control group of pretest and post test score ranged between good (60%) and very good (40%).

Table (4): Relationship of knowledge and practice score between study and control groups before and after program.

	Pre				Post			
	Knowledge		practice		Knowledge		practice	
	Study group	Control group	Study group	Control group	Study group	Control group	Study group	Control group
Mean	٢٨,٢٠	٢٨,٠٠	١٠١,٧	١٠١,٥	٤٠,٨٠	٢٨,٣٣	١١٨,٨	١٠٢
SD	٣,٩٥	٤	٤,٢٨٤	٤,٤٢٨	١,٣٧	٣,٦٩	٤,١٦	٤,٣٩
t	٠,١٣٨		٠,١٢٦		١١,٥٢		١٠,٨٠٥	

df	٢٨	٢٨	٢٨	٢٨
p.value	٠,٨٩١ NS	٠,٩٠١ NS	٠,٠٠١ Sig.	٠,٠٠١ Sig.

In this table, there are no significant differences in score of both pre-test knowledge and practice between study and control groups but highly significant difference of both post-test knowledge and practice is between study and control groups.

Table (5): Relationship of nurse's knowledge pre- and post-in both study and control groups according to age.

Age	Study group						Control group						
	Pre		post		t	p.value& Sig.	pre		post		t	p.value& Sig.	
	Mean	SD	Mean	SD			Mean	SD	Mean	SD			
21-30	٢٨,٧	٤,٣٨	٤٠,٠٦	١,٠٩	٩,٦٣٦-	٠,٠٠١ HS	٢٨,٨٨	٤,٤٢	٢٩,١٣	٤,٦١	١,٠٣	٠,١٧ NS	
31-40	٢٦,٥	٢,٣٨	٤١,٢٥	٠,٩٦	- ١٢,٤٨٥	٠,٠٠١ HS	٢٧,٦٧	٣,٣٣	٢٨	٣,٠٣	١,٠٨-	٠,١٧٥ NS	
<٤٠	٢٩	٥,٦٦	٤١	١,٤١	٧,٩٨	٠,٠٠١ HS	٢٣	٠,٢	٢٤	٠,٣	١٠,٧٤	٠,١٥٦ NS	

This table of the study shows the relation of nurses knowledge according to age 'in the study group there are highly significant differences in knowledge between pre-test and post test in age group (21-30) (31-40) and (<40) years while in control group there is not significant difference in all age group.

Table(6):Relationship of nurses knowledge pre-and post in both study and control groups according to years of experience.

Years of experience	Study group						Control group					
	Pre		post		t	p.value & Sig.	pre		post		t	p.value & Sig.
	Mean	SD	Mean	SD			Mean	SD	Mean	SD		
١- ٥	٣٠	٣,٩٦	٤٠,٨٦	٠,٩	٧,٨٢٥-	٠,٠٠١ HS	٢٩	٤,٧٦	٢٩,٢٩	٤,٩٦	١,٥٥-	٠,١٧٢ NS
٦- ١٠	٢٥,٤	٢,٧	٤٠,٦	٢,١٩	١٩ -	٠,٠٠١ HS	٢٦,٢	١,٦٤	٢٦,٦	١,٣٤	١,٦٣-	٠,١٧٨ NS
١١ - ١٥	٢٨,٦	٤,٠٤	٤١	١	- ٦,٩٩٢	٠,٠٢ Sig.	٢٨,٦٧	٥,١٣	٢٩	٤,٥٨	١ -	٠,٤٢٣ NS

This table shows the relation according to years of experience, the study group shows highly significant difference in knowledge between pre-test and post test in

years of experience groups (1-5) and (6-10) but there is a significant difference in group (11-15) while control group shows no significant difference in all groups.

Table (7): Relation of nurses' practice pre- and post-in both study and control groups according to age.

Age years	Study group						Control group					
	pre		post		t	p.value &sig	pre		post		t	p.value &sig
	Mean	SD	Mean	SD			Mean	SD	Mean	SD		
21-30	102,22	4,02	118,78	3,70	8,19 -	0,001 HS	102,38	0,71	102,70	0,70	2,00 -	0,08 NS
31-40	99,70	4,30	119,00	4,79	0,47 -	0,02Sig	100,33	2,00	101,00	2,78	3,16 -	0,02 Ns.
41-50	103,00	3,04	119,00	8,49	4,43 -	0,014 Sig	102,00	0,2	102,00	0,1	.	1,00 NS

According to age, in the study group there are highly significant differences in practice between pre-test and post test in age group (21-30) years old ($P < 0.001$) and significant group (31-40) and (< 40) while the control group of pre and post test there are not significant differences in age groups.

Table (8): Relation of nurses' practice pre- and post-in both study and control groups according to years of experience.

Years of experience	Study group						Control group					
	pre		post		t	p.value &sig	pre		post		T	p.value &sig
	Mean	SD	Mean	SD			Mean	SD	Mean	SD		
1-5	102,43	0,13	119,43	3,78	7,71 -	0,001 HS	102,86	0,98	103,14	0,98	1,00 -	0,17 NS
6-10	100,70	3,97	117,70	1,14	7,04 -	0,002 HS	99,20	1,10	99,80	1,10	2,40 -	0,07 NS
11-15	102,00	3,71	121,33	7,23	4,46 -	0,004 Sig.	102,33	2,02	103,00	2,70	2,00 -	0,18 NS

This table shows the relation of nurse's practice according to duration of work. In the study groups there are highly significant differences of practice between pre test and post test in duration of work groups (1-5) and (6-10) but there is a significant difference in group .

Discussion

The theoretical part of the educational program was developed purposely by the investigator for the nurses in Hemodialysis units for the purpose of evaluating nurses knowledge. The knowledge score was divided to poor, acceptable , fair, good, very good and excellent. The response after the program varies between very good (6.6%) and excellent (93.4%) (Table 2).

This is supported by (Enrique, 2000), who stated that the training course for the nurse is effective in precipitated more information, which is necessary in giving care to patient . The study also found the effect of nurse's knowledge highly significant as difference of ($p < (0.001)$) was found when analyzing pre and post tests between the control and study groups (Table 4).

Charles (2002) reported that strong association was found between the high test scores and attendance of classes of post graduate nephrology nurses for general information for application [5,6].

The practical part of the educational program included 3 parts of nurse's practice in Hemodialysis trained by the investigator, in preparation of equipment, preparation of dialysis machine and preparation of the patient from connection and disconnection. The training of Hemodialysis nurses shows the educational program affects the practice of the study group who shows differences more than the control groups (Table 3).

The investigator indicated that all the nurses were having a good practice in both groups study and control before program. This result can be demonstrated in a way that the nurses made adequate practice concerning such techniques due to the nature of their application as routine type of work. The program found highly significant difference between study and control group changes to level at ($p < 0.001$) for analyzing the post score of the observation checklist forms of the Hemodialysis nurses of the study and the control groups (Table 4).

Many studies emphasize the effectiveness and importance of nurse involvement in care of Hemodialysis patient in dealing with care of vascular access, prevention and management of complication , purpose of treatment and teaching patients and their families [7,8].

The results reveal that the study and control groups have comparable knowledge and practice with regard to various demographic characteristics as follows:

As a result of the data analysis, the association between the nurses' knowledge and practices with nurses' age indicates a highly significant difference between pre and post test of the study group (Table 5&7).

This result means the educational program is effective for all age groups. This finding agrees with that of another study [8].

Effectiveness of the educational program in knowledge and practice with years of the experience is clearly observed through the result of (Table 6&8). The data analysis of the study group shows highly significant difference between pre and post tests relative to the years of experience in Hemodialysis unit.

This finding was supported by (Roy and Andrens, 1991) who stated that the educational program helps the nurses to enhance and develop skills and information[9].

Recommendations

- 1- A special and long continuing education programs should be established and applied to nurses working in Hemodialysis units to maintain skills.
- 2- Increasing the number of nurses for Hemodialysis unit to be adequate for those patients.

References

- 1- Bioline Company: Bioline and Hemodialysis, Bioline Corporation, Maintained by illumina and SRK Group 2002, PP. 1-4 (Internet).
- 2- Christoph O.: Textbook of Nephrology, Oxford, Oxford University Press, 2000, PP.120-135.
- 3- Deborah G.: The Evolving Role of the Nephrology Nurse, Nursing Time, Vol.95, No.12, March 24, 1999, P.60.
- 4- June & Keen: Nursing assessment and intervention for adult Hemodialysis patients, ANNA Journal, Vol.25, No.3, 2000, PP.311-319.
- 5- Enrique O.: Hemodialysis management and the role of the nurse in caring for dialysis patients, (NISTER), National kidney and transplant institute, May 25, 2000, PP.6-60.
- 6- Charles G.: Postgraduate Nephrology program, Australian Nephrology of Health Education Journal (ANHEJ), Vol.20, No.5, 2002, P.48.
- 7- Tucker C.: The effect of behavioral intervention with patients nurses & family members on dietary non-compliance in chronic Hemodialysis patients, Transplantation Proceeding, Vol.21, No.6, Dec. 1989, PP.3985-3987.
- 8- Kamel W.: Evaluation of health education provided by nurses to patients with Hemodialysis-Scientific journal of nursing, Vol.13, No.1, 2000, PP.68-74.
- 9- Roy & Andrens: Evaluation of nurses learning in nephrology educational program, Nursing Time, Vol.10, No.2, 1999, PP.150-159.