Effectiveness of an Educational Program upon Nurses' Knowledge about Complications Reduction at the Peritoneal Dialysis Units

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الخلاصة

الهدف: تيدف الدراسة إلى تقييم المعارف الكادر التمريضية المتعلقة بمضاعفات النفاذ الصفاقي، وبناء برنامج تثقيفي الملاك التمريضي في وحدات النفاذ الصفاقي، ولمعرفة اثر البرنامج التثقيفي لمعارف الكادر التمريضي بمضاعفات النفاذ الصفاقي، مع إيجاد العلاقة بين تلك المعارف والمعلومات الديموغرافية للكادر التمريضي ىوتسملا) التعليمي وسنين الخبرة(.

المنهجية: أجريت دراسة شبه تجريبية في وحدات النفاذ الصفاقي لمستشفيات بغداد التعليمية من نيسان 2004 إلى نيسان .2006 أختيرت عينة غرضيه مكونة من (50) ممرض/ممرضة من المستشفيات التعليمية في بغداد ويعملون في وحدات النفاذ الصفاقي لتقديم العناية التمريضية للمرضى في هذه الوحدات.
جمعت البيانات من خلال تصميم استمارة استبيانيه تحتوي على (56) فقرة موزعة على (7) وحدات. تم تحديد ثبات أداة القياس من خلال الاختبار والاختبار البعدي وحددت مصداقية أداة القياس من خلال مجموعة من الخبراء.
تم تحليل البيانات من خلال استخدام الإحصاء ألوصفي الذي يتضمن ،ارلكتلا) الوسط الحسابي، الوزن المرجح، الانحراف المعياري، والنسبة المئوية(إضافة إلى استخدام ألإحصاء الاستبياني الذي يتضمن رابتخالا) التائي، معامل بيرسون، مربع كاي، وتحليل التباين للفرق بين الاختبار القبلي والاختبار البعدي الأول والثانية للمجموعة التجريبية(.

النتائج: أظهرت نتائج الدراسة أن هناك تأثير ايجابي للبرنامج التثقيفي على معارف الملاك التمريضي المتعلقة بالمضاعفات في وحدات الفاذ الصفاقي ووجود علاقة ايجابية بين معارف الملاك التمريضي والمستوى التعليمي للمجموعة التجريبية قبل تنفيذ البرنامج التثقيفي.

التوصيات: بناء على نتائج البحث، أوصت الدراسة بتشجيع الملاك التمريضي على المشاركة في البرامج التثقيفية والدورات التدريبية لتطوير ممارساتهم التمريضية في وحدت النفاذ الصفاقي، وبشكل منتظم يجب تقديم البرنامج التثقيفي للملاك التمريضي أثناء العمل في وحدات النفاذ الصفاقي وذلك للمحافظة على المستوى المعرفي لفم.

Abstract

Objectives: The study aims at identifying the nurses' knowledge about peritoneal dialysis complications, to construct an education program for nurses in peritoneal dialysis units, to determine the effectiveness of the education program upon the nurses' knowledge about complications of peritoneal dialysis, and to identify the relationship between the nurses' knowledge and their demographic characteristics of level of education and years of experience.

Methodology: A quasi-experimentai study was carried out at the peritoneal dialysis units of Baghdad teaching hospitals, from April 2004 to April 2006.
ʌ purposive sample of (50) nurse was selected from Baghdad teaching hospitals. These nurses working at the peritoneal dialysis units to provide nursing care for a patient who has undergone peritoneal dialysis.
The data were collected through the use of constructed questionnaire, which comprised of (56) item distributed in (7) sections.
The reliability of the instrument was determined through test-retest and the validity through a panel study of experts.
The data were analyzed through the application of descriptive statistical analysis that included (frequency, mean, mean of scores, standard deviation, and percentage) and the application of inferential statistical analysis that included (test for independent sample, test for dependent sample pre-test and post-test, pearson correlation coefficient, Chi-square, and analysis of variance for the difference between pre-test, post-testi, and post-test2 of the study group).

Results: The results of the study indicated that the education program had a positive impact on the knowledge of nurses in peritoneal dialysis units regarding peritoneal dialysis complications and significant association was identified between the nurses' knowledge relation to their education level at the study group (pre-test).

Recommendations: Based on the result of the study, the study recommended that Nurses who are working at the peritoneal dialysis unit should be encouraged to participate in education program and training session for their benefit of their practice in such units, in service continuing education program should be presented to nurse at the peritoneal dialysis unit on a regular base to maintain their level of knowledge.

Keywords: Nurses' Knowledge, Complications, Peritoneal Dialysis

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Introduction:

The kidneys are organs that filter and excrete excess fluids and solute wastes. When the kidneys fail, electrolyte imbalance occurs, and toxins accumulate in the blood. If excess fluids and toxins are not removed, death results (').

The integrated program of renal replacement therapy comprises of peritoneal dialysis, hemodialysis, and transplantation. As a result, individuals shift from one type of treatment to another as their particular circumstances dictating. Ideally, renal replacement therapy should begin with peritoneal dialysis and then moved as required (2).

In renal replacement therapy, the place of peritoneal dialysis as first line therapy (٤). In peritoneal dialysis, the surface of the peritoneum which amounts to approximately 22.000 cm², acts as the diffusing surface. An appropriate sterile dialyzing fluid (dialysate) is introduced into peritoneal cavity through an abdominal catheter at intervals. Urea and creatinine, both metabolic end products normally excreted by the kidneys, are removed (cleared) from the blood by diffusion and osmosis as waste products move from on area of higher concentration (the peritoneal blood supply) to an area of lower concentration (the peritoneal cavity) across a semi-permeable membrane (the peritoneal membrane) (5).

Peritoneal dialysis is a form of renal replacement therapy for patients with acute or chronic renal failure. The peritoneal dialysis has three steps: Inflow (dialysis is introduced into the abdominal cavity via the dialysis catheter), dwell time (dialysate remains in the abdominal cavity and fluid and electrolytes are drawn in), and outflow (fluid is drained via the dialysis catheter). The exchange that means the preceding three steps combined (6).

The peritoneal dialysis is performed by the nurse in an acute care setting. The nurse individually initiates dialysate infusion and outflow. ٨ number of complications are seen relatively frequently, but often can be treated or prevented with careful nursing care (7).

The complications of peritoneal dialysis can be broadly divided into infectious and non infectious causes. During the early days of peritoneal dialysis, peritonitis was the overwhelming problem and the major cause of technique failure. With improvements in system design and other developments, non infectious complications have become more prominent (4).

Peritonitis is the most common complication and also the most serious; it occurs in (60% to 80%) of patients in peritoneal dialysis (5).

Approximately, one fifth of peritonitis episodes are temporally associated with exit-site infection (8).

In Iraq, the number of individuals with end-stage renal disease estimated (2559) patient in 1991 and this number increased to (3102) patient in 1995 and increased to (4465) in 2000 and increased to (6838) in 2004. On the other hand, the acute renal failure increased from (1181) patient in 2000 to (4586) patient in 2004. The death due to end stage renal disease increased from (1858) in 2000 to (2625) in 2004 (9).

On the other hand, the nurse plays a major role in causing the complications. Many of these complications my result due to lack in nursing practice at peritoneal dialysis units; these include [peritonitis, exit site infection, bladder and bowel perforation, excessive fluid loss, fluid over load, respiratory difficulty, and pain of (abdomen, shoulder and back)] (10)

Methodology:

The design of the study is a quasi-experimental design was conducted on nurses' knowledge about complications reduction at the peritoneal dialysis units. It was carried throughout the present study with the application of pre-test and post-test approach for the study group and control group. This study started from April, 2004 to April, 2006.

The phases of study:

Phase T· Assessment to the complications incidence in peritoneal dialysis units in Baghdad hospitals: In this phase the data collection from (75) patient in peritoneal dialysis units in Baghdad teaching hospitals (Al-Yarmouk teaching hospital, Al-Karama teaching hospital, and Al-Kadhimiya teaching hospital) (Table 1).

The objective of this assessment is to assess the incidence of complications in peritoneal dialysis units and to determine the assessment format to nurses in this unit. The data were collected from May, 15th, 2004 to August, لؤ اللا, 2004.

Table 1. Hospitals' Names of Assessment of Complications

Hospital name	No. of patients
Al-Yarmouk Teaching Hospital	20
Al-Karama Teaching Hospital	40
AIKadhmiyia Teaching Hospital	15
Total	75

Phase II: Assessment of peritoneal dialysis nurses' knowledge about complications reduction in peritoneal dialysis units:

Data were collected from (60) nurse work in peritoneal dialysis units in Baghdad teaching hospitals (Al-Yarmouk teaching hospital, Al-Karama teaching hospital. Surgical Specialties hospital, Al-Kadhimiya teaching hospital, and Baghdad teaching hospital).

The assessment was indicated that the majority of nurses had knowledge deficit. The majority of nurses (75%) lacked knowledge of how can prevent and treatment the complication in peritoneal dialysis units.

Phase IIP. Program construction and the study instruments: The educational program was designed and emerged, as a result of the nurses' knowledge deficit from the assessment of peritoneal dialysis nurses' knowledge and through reading the review of literature.

The study instruments prepared through the review of the related literature, the researcher constructed the questionnaire that was used as a mean of data collection. It consists of (2) major parts: **Part 1:** Demographic information, **Part 2:** Questionnaire to assess peritoneal dialysis nurses' knowledge toward their complications reduction in peritoneal dialysis units.

Phase IV: Validity testing the content validity of the program and the study instrument were determined by the panel of experts to investigate the content of the educational program and questionnaire to reduce the complications in peritoneal dialysis units, for clarity and adequacy in order to achieve the objectives of present study.

Phase V: Reliability ‹ the assessment ‹ peritoneal dialysis nurses' knowledge sample (5) nurse was selected from peritoneal dialysis nurses in Baghdad teaching hospitals. It was applied on the nurses who had the same criteria of the original study sample and started from March 2238 2005 to March 31st, 2005 to determine the internal consistency of questionnaire related to knowledge of nurses in peritoneal dialysis units towards complications reduction.

Phase VI: Pilot study a pilot study was conducted at Al-Kindy Teaching Hospital. It started from April 24, 2005 to May 5th, 2005. The pilot study was carried out on (8) nurse who had the same criteria of study sample.

Phase VII: Implementation of the program The researcher applies the educational program in the College of Nursing, University of Baghdad in June 7th to June 8*, 2005. Because the researcher needs to take all the study group at the same time to give them the educational program and use the same methods. After that the researcher applies the same educational program in peritoneal dialysis units to all hospitals.

The sample of the study was a purposive sample of (50) nurse who were selected from five teaching hospitals in Baghdad city, (25) nurse as the study group. Another (25) nurse were selected as the control group in the same criteria. The data were analyzed through the application of descriptive statistical analysis that included (frequency, mean, mean of scores, standard deviation, and percentage) and the application of inferential statistical analysis that included (t-test for independent sample, t-test for dependent sample pre-test and post-test, Pearson correlation coefficient, Chi-square, and analysis of variance for the difference between pre-test, post-test1, and post-test 2 of the study group).

Results:

Table 2. Distribution of demographic data in study and control groups from peritoneal dialysis nurses

Demographical Characteristics		Study group		Control group	
		F	%	F	%
Age	20-30	14	56	13	52
	31-40	9	36	10	40
	41	2	8	2	8
	Total	25	100	25	100
Years of experience in peritoneal dialysis units	2-10	13	52	13	52
	11-20	9	36	9	36
	21<	3	12	3	12
	Total	25	100	25	100
Sex (Gender)	Male	14	56	14	56
	Female	11	44	11	44
	Total	25	100	25	100
Educational level	Secondary nursing school	5	20	5	20
	Nursing institute	18	72	18	72
	Nursing college	2	8	2	8
	Total	25	100	25	100
Training course and/or conference (related or not related 10)	Yes	0	0	0	0
	No	25	100	25	100
	Total	25	100	25	100

f=frequency, %c percentage

Table (2) reveals that the majority of **the study group** was males (56%), (20-30) years old (56%), nursing institute graduates (72%), having (2-10) years of experience (52%), and all of them have no opportunity to be involved in training sessions and/or conferences. In **the control group,** the majority was males (56%), (20-30) years old (52%), nursing institute graduates (72%), having (2-10) years of experience (52%), and all of them have no opportunity to be involved in training sessions and/or conferences.

Table 3. The comparative differences between the study group and control group of nurses' knowledge to pre-test relative to all complications

Items	Study group Mean	Control group Mean	t-Observed
Infection (peritonitis and exit site infection)	**21.656**	**20.984**	**0.202**
Back pain	20.000	**20.800**	0.161
Abdominal pain	**29.092**	**28.536**	**0.124**
Respiratory difficulty	**20.672**	**19.336**	**0.303**
Shoulder pain	**26226**	**24.536**	**0.590**
Fluid balance (fluid excess or deficit).	**20.984**	**22.668**	**0.571**
Bladder and bowel perforation	**34.224**	**31.900**	**0.599**
All complications	**24.693**	**24.108**	**0.228**
348	**t-critical= 2.403**	**p> 0.01**	

df=degree of freedom, ص probability level, t-critical= critical value, t-0bserved== observed T-test value

This table shows that there is no significant differences between the study group and the control group of nurses' knowledge relative to all complication in pre-test.

Table 4. The comparative differences between the study group and control group of nurses' knowledge to post-testl relative to all complications

Items	Study group Mean	Control group Mean	t-Observed
Infection (peritonitis and exit site infection)	70.968	20.985	13.382
Back pain	74.400	22.400	9.636
Abdominal pain	72.120	31.384	10.129
Respiratory difficulty	79.996	19.336	12.691
Shoulder pain	78.252	23.398	14.503
Fluid balance (fluid excess or deficit)	69.290	22.332	13.618
Bladder and bowel perforation	82.840	34.236	12.861
All complications	76.123	24.724	17.064
1*48	**t-critical= 2.403**	**P≤0.01**	

df=degree of freedom, p= probability level, t-critical= critical value, t-observed= observed T-test value

This table shows that there are highly significant differences between the study group and the control group of nurses' knowledge relative to all complication in post-test I.

Table 5. The comparative differences between the study group and control group of nurses' knowledge to post-test n relative to all complications

Sections	Study group mean	Control group mean	t-observed
Infection (peritonitis and exit site infection)	68.968	20.804	11.994
Back pain	74.400	21.600	10.949
Abdominal pain	77.696	33.080	9.906
Respiratory difficulty	76.664	22.668	11.036
Shoulder pain	74.260	23.968	12.796
Fluid balance (fluid excess or deficit).	68.292	22.668	13.346
Bladder and bowel perforation	82.268	34.224	13.256
All complications	74.649	25.573	16.820
df^48	t-critical= 2.403	p 0.01	

df=degree of freedom, p: probability level, t-critical= critical value, t-observed= observed T-test value

This table shows that there are highly significant differences between the study group and the control group of nurses' knowledge relative to all complication in post-test n.

Table 6. Association between nurses' knowledge relative to their education level in pre-test at the study group

Education level		Poor	Fair	Good	Total
Nursing college graduate	Frequency	**0**	0	**2**	**2**
	0/	**0**	0	**8**	**8**
Nursing institute graduate	Frequency	**3**	10	**5**	**18**
	0/	**12**	40	**20**	**72**
Secondary nursing school graduate	Frequency	**4**	1	**0**	**5**
	%	**16**	4	**0**	**20**
Total	Frequency	7	11	7	**25**
	%/	**28**	44	**28**	**100**
^observed = 13.398	df=4	^critical =13.277		p ≤ 0.01	

df=degree of freedom, p=probability level, t-critical= critical value, -/' criticalcritical chi-square, -/' observed = observed chi-square

This table has indicated that a significant association is identified between the nurses' knowledge relation to their education level at the study group in pre-test.

Table 7. Association between nurses' knowledge relative to their education level in post-test lat the study group

EducationJevel		Poor	Fair	Good	Total
Nursing college graduate	Frequency	0	0	2	2
	%	0	0	8	8
Nursing institute graduate	Frequency	2	6	10	18
	%	8	24	40	72
Secondary nursing school graduate	Frequency	4	1	0	5
	%	16	4	0	5
Total	Frequency	6	7	12	25
	%	24	28	48	100
758.21=t-observed· df=4		% critical=13.277		p ≤ 0.01	

dfdegree of freedom, p=probability level, t-critical= critical value, criticalcritical chi-square, ^observed = observed chi-square

This table has indicated that there is no significant association is identified between the nurses' knowledge relation to their education level at the study group in post-test.

Table 8. The Comparative differences between the pre-test and post-test 1 of study group's knowledge relative to all complications

Sections	Pre-test Mean	Post-test Mean	t-Observed
Infection (peritonitis and exit site infection)	**21.656**	70.968	16.222
Back pain	20.000	74.400	11.959
Abdominal pain	**29.092**	77.120	17.665
Respiratory difficulty	**20.672**	79.996	16.426
Shoulder pain	26.225	78.252	16.360
Fluid balance (fluid excess or deficit).	**20.984**	69.290	19.679
Bladder and bowel perforation	34.224	82.840	17.026
All complications	**24.693**	76.123	29.851
df= 24	t-observed: 2.492	P ≤ 0.01	

df=degree of freedom, p=probability level, t-observed= observed T-test value

,This table show that there is a highly significant difference between pre-test and post-test I of nurses' knowledge relative to all complications.

Table 9. The comparative differences between the pre-test and post-test 11 of study group's knowledge relative to all complications

Sections	Pre-test Mean	Post-test Mean	t-obscrved t-Observed
Infection (peritonitis and exit site infection)	**21.656**	68.968	12.528
Back pain	20.000	74.400	11.255
Abdominal pain	29.092	77.696	15.743
Respiratory difficulty	20.672	*76.664*	13.762
Shoulder pain	26.225	74.260	13.079
Fluid balance (fluid excess or deficit).	**20.984**	68.292	19.796
Bladder and bowel perforation	34.224	82.268	16.257
All complications	24.693	74.649	24.944
df= 24 t-critical= 2.492		P ≤ 0.01	

dfdegree of freedom, p=probability level, t-observed= observed T-test value

This table shows that there are highly significant differences between pre-test and post-test I of nurses' knowledge relative to all complications.

Table 10. Analysis of variance for the difference between pre-test, post-test ι, and post-test n of the study group relative to nurses' knowledge about all complications

Sections	f
Infection (peritonitis and exit site infection)	88.833
Back pain	63.342
Abdominal pain	61.784
Respiratory difficulty	77.812
Shoulder pain	109.317
Fluid balance (fluid excess or deficit).	102.036
Bladder and bowel perforation	97.358
All complications	163.440
f-critical=	P≤0.01

f-critical= F statistics, p= probability level

The findings of this table show a significant difference between pre-test, post-test 1, and post-test n groups and within the groups relative to nurses' knowledge about all complications.

Discussion:

Analysis of such characteristics in (Table 2) of the study group and control indicated that the majority of the nurses in study group (52%) was (2-10) years of experience in peritoneal dialysis unit. This result indicated that the (2-10) years of experience in peritoneal dialysis unit was predominant among the nurse staff, because the transition of nurse from unit to another one in small period and another cause was that the nurses do not wish to work in peritoneal dialysis unit, because this unit needs difficult duty.

Throughout the course of data analysis, the findings presented that the majority (56%) of the study group and control group was males, because the work in peritoneal dialysis is greatest job opportunity to male and this job needs heavy work.

Relative to their education status, most of the nurses in the study group and control group (72%) was institute graduate. All of them (100%) did not attend any training session and/or conferences regarding the knowledge related peritoneal dialysis. They were not fortunate to be enrolled in any training session and/or conferences, because such sessions or conferences were not available and present to them. The researcher suggests an opportunity for peritoneal dialysis nurses to be enrolled in training sessions and/or conferences to improve their knowledge and skill and keep them to up-dated knowledge concerning dialysis. This suggestion was in agreement with the finding obtained from Al-Mansory (2005) study that mentioned that the nurses should be enrolled in training sessions (").

The data analysis has revealed that were no significant differences between the study and control groups' knowledge of pre-test relative to complication reduction in peritoneal dialysis units (Table 3). This finding has provided the support and the logical reasoning because the researcher selected the sample of the study by correct methods, the sample has the same criteria and there are no significant differences between them. The researcher selects the study and the control groups by using homogeneity method as possible. Polit and Hungler (1999) revealed that the researcher must use the homogeneity approach to control intrinsic subject characteristics that could contaminate the relationship under investigation (12).

The results in Tables (5 and 4) indicated that there were significant differences between the study and the control groups' knowledge of post-test 1 and post-test n relative to complications reduction in peritoneal dialysis units. These significant differences result, because the researcher applies the educational program concerning the complication reduction in peritoneal dialysis units to the study group and do not apply this educational program to control study. These results agree with the study by Al-Hakkak (2004) which revealed that there were significant differences about nurses' knowledge in post-test between study and control groups (nurses in dialysis units) (13).

The results in Table (6) revealed that there is a significant association between the level of education and the nurses' knowledge to study group to all complication in pre-test; these results indicated that the logical relationship between the level of education and nurses' knowledge, because the peritoneal dialysis process needs to vary the knowledge the nurses take in their study, for example if the nurses leam the process of osmosis, diffusion, and Ultrafliteration mean that the nurses know the principle of peritoneal dialysis and can control the fluid balance during peritoneal dialysis process. This result is disagreed with the finding of the information listed by Yazigi and Zahr (1989) who noted a strong association between level of education and pre-test knowledge (14).

In post-test, there was no significant relationship between the level of education and the nurses' knowledge of the study group to all complications Table (7). This result disagreed with the study done by Al-Hakkak (2004) who revealed that there was a significant association between the nurses' knowledge and level of education of the study group in hemodialysis nurse at Baghdad hospitals.

In addition, this finding disagreed with Enreque (2000) studies who demonstrated that the training course was effective for every level of an education status and the training course was very important to enhance new information for the nurse. Another study done by Al-Mansory (2005) in Baghdad hospitals which demonstrated that there is a significant association between level of education and the nurses' knowledge to all nurses in peritoneal dialysis (13, 15, 19).

The findings in Tables (8 and 9) demonstrate that there are highly significant differences between the pre-test and (post-test I or post-test fl) to study groups' knowledge

relative to complications reduction in peritoneal dialysis units. These significant differences between the pre-test and (post-test I or post-test n) result from the researcher applies the manipulation (educational program) to the study group.

Kuntzle and Thomas (1997) revealed that the educational opportunities provided to nephrology nurses with a knowledge-base enable them to assess, plan, implement, and evaluate individualized care (16).

The data analysis has revealed that there are significant differences between the pre-test and post-test I and post-test n to study groups' knowledge relative to complication reduction in peritoneal dialysis units (Table 10). These results agree with study made by Aziz, (2001). This study to measures the impact of program upon mothers' knowledge and practices towards their leukemia children. 15 study indicates that there is a significant difference between the pre-test and follow-up n and follow-up III of the study group 17'.

Recommendations:

Based on the results of the study the researcher recommends that a specific education program can be designed and present to nurses who have minimum level of experience in order to improve their level of knowledge, the education program of the present study can be used as a mean for knowledge improvement for nurses who are working at the peritoneal dialysis units, nurses who are working at the peritoneal dialysis unit should be encouraged to participate in education program and training session for their benefit of their practice in such units, and in service continuing education program should be presented to nurses at the peritoneal dialysis unit on a regular base to maintain their level of knowledge.

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