Effect of an Educational Program on Nurses' Knowledge and Care Practices for Patients undergoing Peritoneal Dialysis

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Abstract

Background: Renal failure has elevated to a global public health issue as the total number of End Stage Renal Failure (ESRF)patients that need renal replacement treatment has been sharply increasing. Peritoneal Dialysis (PD) is a method used for replacement of renal function that it is utilized at the end stage of renal disease beside with the hemodialysis and renal transplantation. Objective: Determine the effect of educational program on nurses' knowledge and care practices for patients undergoing PD. Setting: This study was conducted at the PD units of AL-Karama Hospital, AL-Yarmook Hospital, AL-Kadhmiyia Hospital, Baghdad Teaching Hospital and AL-Kindy Teaching Hospital in Baghdad City, Iraq. Subjects: 64 nurses (male / female) to participate in the present study who providing direct nursing care for patients undergoing PD at the above-mentioned settings. Tools: The researcher developed two tools which used to collect the necessary data; a nurses' knowledge related to patients undergoing PD and a nurses' care practices for patients undergoing PD observational checklist. Results: The study revealed that there was a significant improvement within the studied nurses had fair and good level of knowledge and practice immediately and after one month from the implementation of the program. Also, there were significant differences between knowledge and nurses' care practices in the initial assessment, immediately, and after one month from implementation of the program. Conclusion: The educational program has a positive effect on the nurses who attend the educational program and achieve a higher mean score of knowledge and care practices for patients undergoing PD than before the educational program. Recommendations: Establishment of a central in-service educational department in a hospital to renew nurses' knowledge and practice on a regular basis. Continuous nurses knowledge and practices evaluation on PD procedure competency should be taken into consideration.

Keywords: Care Practices, Educational program, Knowledge, Peritoneal Dialysis.

Introduction

Over the recent decades, chronic diseases have posed a significant challenge to healthcare systems all around the world. Chronic diseases are accounting 63% for the leading cause of all deaths in the world. Chronic Renal Disease (CRD) considers serious public health issue, which causes patients progressively lose renal function (Schaepe & Bergjan, 2015).

End Stage Renal Disease (ESRD) is known the total loss of renal function, which is a common problem worldwide that can be diagnosed by using a variety of laboratory and imaging diagnostic techniques. It happens when a diseases or conditions impairs renal function, which is causing renal

damage to worse over several months or years. This including; diabetes mellitus, hypertension, blocked urine flow, renal diseases, renal arterial stenosis, certain toxins, fetal developmental issues, systemic lupus erythematosus, overuse some medications such, as Non Steroidal Anti-inflammatory Drugs (NSAIDs), and renal injury (Kolvek, 2014).

Medical management of CRD involves dialysis to remove of waste products and extra water from blood. the dialysis is classified into two types; Hemodialysis (HD) and PD. In relation to surgical management, renal transplantation involves surgically putting a healthy renal from a donor in the patient body which is used when there are no life threatening medical conditions other than renal failure (Ibrahim, et al., 2019). Peritoneal dialysis has a many series of advantages like low mortalities rate in the first year, greater flexibility, autonomy, fewer hospital visits and better preservation for residual renal function. While the main disadvantages of PD are the risk of infections and a limited life-duration due to the peritoneum membrane failure (Mihalache, et al., 2018).

The nurses work together with others members of the multidisciplinary health care team to ensure that patients' kidney function does not decline and promote the kidney function. Nurses are responsible for conducting thorough physical, psychological, and social assessment of the patient's condition, and following the patients for any signs of complications related to PD. (Roxas, 2017). In this context, nurses play a significant role in the care of patients undergoing PD treatment, whether by performing nursing procedure or by assessing and providing information on their health condition, drugs, and therapeutic diet (Campos, et al., 2019). Nurses' knowledge and skills level will significantly effect on the quality of dialysis and so patients' quality of life (Lucena, et al.,2018).

Aim of the study

Determine the effect of an educational program on nurses' knowledge and care practices for patients undergoing PD in Baghdad city.

Research hypotheses
The present study hypotheses were;
- Nurses who attend the educational program achieve higher mean score of knowledge related to PD than before the educational program.
- Nurses who attend the educational program achieve higher mean score of care practices than before the educational program.

Materials and Method
Materials
<u>Design:</u> Quasi experimental design, one group pre and post test

<u>Setting:</u> The present study was conducted at The PD units in these hospital; AL-Karama Hospital, AL-Yarmook Hospital, AL-Kadhmiyia Hospital, Baghdad Teaching Hospital and AL-Kindy Teaching Hospital.

<u>Subjects:</u> A stratified random sample and a proportional allocation was used for (55) nurses who were from the total 64 nurses who were concerned with providing direct nursing care for patients undergoing PD at the above-mentioned settings.

<u>Tools:</u>
In order to fulfill the objectives of the study two tool were developed by the researcher as following;

Tool I : Nurses' Knowledge related to Patients Undergoing Peritoneal Dialysis: After review of relevant literature, the researcher developed this tool that is including two parts as follows:
Part I: Nurses' Socio- demographic characteristics: This part was developed for collecting data about nurses' socio-demographic characteristics as: age, gender, marital status, level of education, years of experiences in hospital, years of experiences in PD, and number of training session courses regarding the PD, place of training session inside or outside of Iraq.

Part II : Nurses' Knowledge related to Nursing Intervention for Patients undergoing Peritoneal Dialysis Questionnaire: It was developed by the researcher depend on a review of the related literatures (Khudhair, & Al-Ani, 2006; Finkelstein et al., 2011; Schaepe & Bergjan, 2015; Guillouët, et al., 2019) to assess nurses' knowledge regarding nursing intervention for patients undergoing PD. The researcher translated into arabic language to be more understandable by nurses. It consisted of 39 questions (multiple choice questions).

Tool II: Nurses' Care Practices for Patients undergoing Peritoneal Dialysis Observational Checklist: An observation checklist to assessing the actual nurses' practices was developed by the researcher depend on review of the related literature **(Khudhair, & Al-Ani, 2006; Finkelstein et al., 2011; Schaepe & Bergjan, 2015; Guillouët, et al., 2019).** This tool comprised 122 items distributed into 5 observed nursing practices.

Method:
- An Approval from the Committee of Research Ethics College of Nursing in Alexandria University was obtained.
- An official permission from the College of Nursing in Alexandria University was gotten and directed to the responsible authority for the study settings.
- The developed tools were tested for content validity via five experts in Medical Surgical Nursing department to be sure the content validity, clarity items and comprehensiveness.
- Reliability of tools was tested by using cronbach's alpha-test and its value (r) was 0.882 which indicates it was statistically reliable. Also the tool's reliability was done by using inter-rater ratability test and the result was 0.93.
- A pilot study was carried out on seven nurses (10%) in order to test the clarity, feasibility and applicability for the tools.

Those nurses were excluded from the study sample
- The study was carried out through 4 phases(assessment phase, planning phase, implementation phase and evaluation phase). The data collection extended from April 2022 to September 2022.

Assessment phase:
Initial assessment of each study participant was carried out before beginning of an implementation of the educational program on nurses' practices by using tools I and II to assess existing nurses' practices.

Planning phase:
The researcher developed an educational program based on a recent literature review and obtained data from the initial assessment to enhance nurses' practice. The program included two parts. The first part included theoretical information about renal failure, and PD procedure. The second part includes performance regarding practical nursing management of PD patients. The final draft of the developed educational program was translated to into Arabic and then revised by five academic experts in the field of the Medical Surgical Nursing department.

Implementation phase:
The developed educational program was delivered to the nurses through (7) sessions. These sessions included theoretical (4 sessions) and practical (3 sessions) information. It was designed and presented in (7) sessions on two times per week for each hospital. Every session took approximately from (60-90) minutes. Various teaching methods were apply in the forms which group discussion, demonstration and re-demonstration, power point presentation, training in real situation and printable version of educational program was given to every participant.

Evaluation phase:
Peritoneal dialysis nurses' practices were compared before and after implementation of the educational program

immediately and after one month to determine the effectiveness of the program on the nurses' knowledge and practice.

Ethical considerations

Written informed nurses' consent to the participates in the study was performed before data collection after explaining the purpose and nature of the study. Witness consent was obtained from the head nurse for nurse's observation and implementation of the program. Confidentiality of the collected data was assured throughout the study. The subjects' participation was on voluntary base and they have been the right to withdrawing from this study at any time.

Statistical analysis

After the collected data, that were organized, tabulated, and then statically analyzed by using the statistical package of social studies (SPSS) Version 25.0. the qualitative data were described via number and percent. the quantitative data were described throughout mean ± standard deviation. Finally, the analyzing and interpreting of data were conducted. P. value of 0.05 or less was considered statistically significant.

Results

Table (1) shows the frequency distribution of studied nurses related to their socio demographic characteristics. It was noticed that (38.2%) of nurses were in the group age of (20≥30) years and the highest percentages of the studied nurses (65.5%) were females, and more than half of them (50.9%) were married. For their level of education, the approximately half of sample of the study nurses (45.5%) had nursing institute certificate and the highest percentage of nurses in study had (6-10) years of experience in hospital as general (32.7%) and in PD field (43.6%). About one-third of the studied nurses (30.9%) attended one previous training session about PD and approximately half of the studied nurses (47.3%) attended training sessions inside Iraq.

Table (2) shows statistically significant increase in mean score of nurses' knowledge about all items of care of patients undergoing peritoneal dialysis in all stages of the program. On the other hand, overall knowledge mean score was (17.16) which increase significantly to be (33.75) and (31.60) in immediate and after one month from this educational program implementation respectively (p=0.001)

Table (3) revealed that 89.1% of the studied participants had poor level of knowledge before implementation of the program. While, 3.6% of the studied participants had poor level of knowledge, 25.5% of the studied participants had fair level of knowledge and 70.9% had good level of knowledge in immediately after implementation of the educational program. In addition, 9.1% of the studied participants had poor level of knowledge, 23.6% of the studied participants had fair level of knowledge =23.6% and 67.3% had good level of knowledge after one month from the implementation of the educational program. Also, the table showed that there was significant difference between nurses' knowledge in the pre-assessment, immediate and after one month from implementation of the program (Fr=99.366 and p=0.001).

Table (4): Illustrates the difference in nurses' care practices mean score about all items of care for patients undergoing peritoneal dialysis. Overall practices mean score was (107.6) which increased significantly to be (202.7), and (200.1) in immediate, and after one month of program implementation respectively (p=0.001)

Table (5) revealed that majority of the studied participants (85.5%) had poor level of practice, 14.5% had fair level of practice, and 0% had good level of practice before implementation of the program. While, 1.8% of the studied participants had poor level of practice, 29.1% of the studied participants had fair level of practice, and 69.1% had good level of practice immediately after implementation of the program. In addition, 7.2% of the studied

participants had poor level of practice, 27.3% of the studied participants had fair level of practice, and 65.5% had good level of practice after one month from the implementation of the program. Also, the table showed that there was significantly difference between nurses' care practices in the pre-assessment, immediate and after one month from implementation of this educational program (Fr=99.366 and p=0.001)

Table (6) illustrated the correlation between the nurses' knowledge and care practices for patient undergoing peritoneal dialysis. This table showed high a positive correlation between nurses' knowledge and care practices during pre, immediately and after month from the implementation of program.

Table (7) shows that there was a relation found between nurses' care practices mean score in the initial assessment and their previous training sessions in peritoneal dialysis, and place of training sessions in peritoneal dialysis p= (<0.001*), and (<0.001*) respectively. While throughout the post educational program implementation the relation was found among the nurses' care practices mean score and their level of education, and place of training sessions in peritoneal dialysis p= 5.874* (0.002*), 5.342* (0.003*), 5.416* (0.003*), 5.615* (0.002*)

Discussion

Chronic Renal Failure (CRF) is a disease results from multiple causes that lead to an irreversible decrease in renal function and that usually leads to ESRF. (Ghodsian. et al., 2021). Peritoneal Dialysis (PD) is a type of therapy which used for replacement of renal function that could be utilized at ESRF beside with the hemodialysis and renal transplantation. (Mihalache, et al., 2018).

The peritoneal dialysis nurse plays a vital role in providing health education, caring, supporting, understanding and therapeutic counselling for the patient and family throughout the course of the illness. The nursing management should be provided to reduce the complications of renal failure and the stress of dealing with an illness that is life-threatening (James, et al., 2014).

The current results of the present study revealed that more than one third of nurses were in the age group of 20≥30 years. In fact, the higher proportion of older nurses working in the hospitals leaving their jobs, thus, young adult nurses percentages greater than older nurse. In addition, another valuable reason to be considered is the low-recruitment posting from the government itself despite the nursing shortage. This result is in line with Kang, et al., (2019) who evaluate burden and quality of life between caregivers for patients receiving PD, so they found that the highest percentage of the sample in their study were in the age group between 21-30 years old.

As regard to gender, the more than half composed of female. These results are in line with Guillouet, et al., (2019) who noticed that females were the dominant gender. From the researcher's opinion, male nurses tend to immigrate and work in other country due to pursuit of higher salary. In relation to marital status of the study sample, the result found that the more than half of the participants were married. This result was supported by Guillouet, et al., (2019) who found the prevalent marital status was married in her studied nurses.

Concerning the level of education, approximately half of sample of the study had nursing institute certificate. This results are in agreement with Figueiredo, et al., (2016) who studied a syllabus for teaching PD to patients and caregivers who reported that highest percentage of nursing staff had diploma from secondary school. Concerning the years of experience in hospital as general and in peritoneal dialysis field, the results of the present study revealed that the more than third of nurses in study had 6-10 years of experience. This result is in line with Shubayra (2015), as his results indicated that the higher percentage of his study sample had years of experience in nursing between 6-10 years.

About the availability of the training sessions in peritoneal dialysis units, the study shows that about one third of the studied nurses attended one previous training session about peritoneal dialysis and it was inside Iraq. This finding could be attributed to the reality that the majority of the studied nurses are very busy related to shortage of staff that's restrain their continuing education. This result was supported by Franco, et al., (2021) who found in their study sample that half nurses had formal training program one training sessions in peritoneal dialysis.

Regarding to the implementation of the educational program, the finding of the present study showed that nurses' knowledge had been improved significantly immediately after implementation the educational program. The study found that the highest percentage of the studied nurses had fair and good level of knowledge. Also the most of the studied participants had fair and good level of knowledge after one month of program implementation. In addition, the present study shows that a significantly difference in the total mean score was found in pre and after immediate program implementation regarding the effectiveness duration for the knowledge about caring of patient undergoing peritoneal dialysis. This result is in agreement with Nopsopon, et al., (2022), who stated that offering education classes for nurses can be successful in enhancing nurses' knowledge. As a result, the implemented of educational program was effective and had an impact upon the nurse's knowledge about assessment and management of patients undergoing peritoneal dialysis.

Moreover, there was a significantly difference in all items mean scores found pre and post educational program, as the highest mean score (3.47) of nurses' knowledge in the pre assessment was for (causes, clinical manifestations and stages of renal failure), which increased significantly to be (5.73), and (4.93) respectively in immediate and after one month evaluation. While the lowest mean score of nurses' knowledge (0.98) was

for (peritoneal dialysis definition and anatomy of peritoneum) which increase significantly to be (2.62) in immediate and after one month from the program implementation.

According to the researcher point of view, the nurses nowadays do not adhere to clinical practice guidelines despite a clear indication to implement recommendations, an example of which is the nurses' knowledge about (their role in peritoneal dialysis procedure, prevention of complication, and diet education) had low mean score (3.24) and it was increased significantly to be (7.0) and (6.55) in immediate and after one month evaluation.

These results are consistent with the study of Zhang, et al., (2016), who has been emphasized that system-related barriers and facilitators such as heavy nurses' workloads and high nurse-patient ratios are considered causes to a lack of educational programs to reinforce or update knowledge about PD procedure that was clear in low mean score for participants answered of the survey items correctly before implementation peritoneal dialysis program, so the nurses should have the specialized theoretical and clinical skills involving familiarity with the principles of PD and aseptic techniques, which require to be enhanced by subsequent ongoing education. Also, Bergjan & Schaepe, (2016) who found that in their study, the application of a nursing educational program about peritoneal dialysis could improve nurses' knowledge and practice concerning the prevention of complications and patient education such as nutritional health education.

From the results of the present study, the nursing care practice for patient undergoing peritoneal dialysis has been improved after conducting the educational program compared to initial assessment which that majority of the studied participants had poor level of practice before implementation of the educational program. While the study found that the highest percentage of the studied participants had

fair and good level of practice immediately and after one month. In addition, the results of the study revealed, that there was a significantly difference in the total mean score was found in pre and after immediate implementation the educational program toward improvements in nurses mean score of care practices. This result was reinforced by Zhang, et al., (2016) who indicated that continuing education led to improvement in the nurses' professional behavior that come from the enhancement in their knowledge and practice about peritoneal dialysis patients management and nursing performance.

In relation to the initial assessment the highest mean score (26.25) of nurses' care practices items was for nurse's practices to disconnect patient from PD, which increased significantly to be (51.95), and (51.13) respectively in immediate and after one month evaluation. While the lowest mean score of nurses' care practices (14.24) was for nurse's practices before connect patient on PD which increased significantly to be (28.20) and (27.80) in immediate and after one month of the program implementation. From the researcher's opinion, the knowledge application was utilized when nurses acquired knowledge about caring patient undergoing peritoneal dialysis put into action. This appeared in nurses practices throughout implementing peritoneal dialysis procedure, for example the nurses were observed more adherent for aseptic techniques to prevent infection before, during, and after peritoneal dialysis procedure.

This result was explained by Bonnal, et al., (2020) who stated that the nurses with enhanced knowledge and better care practices show better adherence to recommended protocols peritoneal dialysis and have lower associated infection rates for patient with peritoneal dialysis. Also, this results were in agreement with Chow, et al., (2019) who study the intervention design supporting skills development for peritoneal dialysis nurses. They reported that many nurses had inadequate knowledge and a poor

practices towards caring patient undergoing peritoneal dialysis, which improved through educational intervention.

Moreover, a positive correlation was detected between nurses' knowledge and care practices. This result is in line with Nopsopon, et al., (2022) who stated that the nursing knowledge had been developed and established as a systemic and generalized knowledge base for practice. They added that knowledge was necessary for nurses to improve practice. This fact is based on the recognition that nursing knowledge should be viewed in conjunction with their practice, also the gaining of knowledge and the application of that knowledge through nursing practice.

Finally, the current study indicated that there was a significantly relation found between nurses' care practices mean score in the initial assessment and their previous training sessions in peritoneal dialysis, and place of training sessions in peritoneal dialysis. While in the post educational program implementation the relation was present between nurses' care practices mean score and their level of education, and place of training sessions in peritoneal dialysis. These findings were in line with Szeto, et al., (2019) who stated the nurses in peritoneal dialysis should have high level of education and continues in service training program to improve their practices regarding patient undergoing peritoneal dialysis .

Conclusion
The present study concluded that, the educational program about caring of patients undergoing peritoneal dialysis was able to improve nurses' knowledge and showed an impact on their practice changes. Furthermore, continuous staff evaluation regarding caring of patients undergoing peritoneal dialysis should be taken into consideration

Recommendations
depend on the finding of the study, the researcher recommended to:

- establishment of a central inservice educational department in a hospital to renew nurses' knowledge and practice on a regular basis.
- developed booklet about nursing intervention for patients undergoing peritoneal dialysis and standard to apply peritoneal dialysis procedure should be available in the dialysis unit.

- Continuous nurses' knowledge and practices evaluation and peritoneal dialysis procedure competency should be taken into consideration.
- Peritoneal dialysis nursing development should be integrated as a basic science in the nursing curriculum.

Table (1): **Distribution of the Studied Nurses according to their Socio- Demographic Characteristics (n = 55)**

Nurses' Socio- Demographic Characteristics	No. (n=55)	%
Age (years)		
20 ≥ 30	21	38.2
31 ≥ 40	18	32.7
41 ≥ 50	12	21.8
51 ≥ 60	4	7.3
Gender		
Male	19	34.5
Female	36	65.5
Marital status		
Single	20	36.4
Married	28	50.9
Divorced	4	7.3
Widow	3	5.5
Level of education		
Nursing session	3	5.5
Secondary Nursing School	16	29.1
Nursing Institute	25	45.5
Nursing college	11	20.0
Hospital Setting		
AL-Karama Teaching Hospital	10	18.2
AL-Yarmook Teaching Hospital	9	16.4
AL-Kadhmiyia Teaching Hospital	11	20.0
AL-Kindy Teaching Hospital	13	23.6
Baghdad Teaching Hospital	12	21.8
Years of experience in hospital		
1-5 years	17	30.9
6-10 years	18	32.7
11-15 years	11	20.0
16-20 years	6	10.9
More than 20 years	3	5.5
Years of experience in peritoneal dialysis		
1-5 years	19	34.5
6-10 years	24	43.6
11-15 years	12	21.8
Number of training sessions in peritoneal dialysis		
None	15	27.3
1	17	30.9
2	10	18.2
3	7	12.7
4 or more	6	10.9
Place of training sessions in peritoneal dialysis		
Inside Iraq	26	47.3
Outside Iraq	5	9.1
Both	9	16.4
None	15	27.3

Table (2): Difference in Mean Score of Nurses' Knowledge about Peritoneal Dialysis (n = 55)

Nurses' Knowledge Items (grades)	Pre		Immediate		After 1 month		Test		Sig. bet. Periods		
	Mean	SD.	Mean	SD.	Mean	SD.	F	P	p_1	p_2	p_3
Renal failure definition and types	2.38	0.73	3.75	0.64	3.64	0.70	118.282*	<0.001*	<0.001*	<0.001*	0.250
Causes, clinical manifestations and stages of renal failure	3.47	1.14	5.73	0.62	4.93	0.54	128.714*	<0.001*	<0.001*	<0.001*	<0.001*
Peritoneal dialysis definition and anatomy of peritoneum	0.98	0.87	2.62	0.62	2.62	0.56	145.316*	<0.001*	<0.001*	<0.001*	1.000
Principles of peritoneal dialysis	1.85	0.76	3.78	0.46	3.49	0.69	205.112*	<0.001*	<0.001*	<0.001*	0.003*
Indication, contraindication, advantages and disadvantages for peritoneal dialysis	2.18	0.86	3.62	0.62	3.45	0.77	117.258*	<0.001*	<0.001*	<0.001*	0.083
Complication of peritoneal dialysis	1.11	0.81	2.45	0.66	2.25	0.62	95.766*	<0.001*	<0.001*	<0.001*	0.011*
Steps of peritoneal dialysis, preparation of patient, environment and equipment for peritoneal dialysis	1.95	1.10	4.80	1.18	4.67	1.06	170.458*	<0.001*	<0.001*	<0.001*	0.635
Nursing role in peritoneal dialysis procedure, prevention of complication, and diet education	3.24	1.76	7.0	1.91	6.55	1.66	132.099*	<0.001*	<0.001*	<0.001*	0.015*
Overall Knowledge	**17.16**	**4.48**	**33.75**	**4.53**	**31.60**	**3.93**	**544.071***	<0.001*	<0.001*	<0.001*	<0.001*

F: F test (ANOVA) with repeated measures
p: p value to comparing between the studied periods
p_1: p value to comparing between Pre and Immediate
p_2: p value to comparing between Pre and After 1 month
p_3: p value to comparing between Immediate and After 1 month
*: Statistically significant at p ≤ 0.05

Table (3): Distribution of the Studied Nurses according to Level of Nurses' Knowledge about Peritoneal Dialysis (n = 55)

Nurses' Knowledge Level	Pre Education Program		Immediate Education Program		After 1 Month Education Program		Fr	p
	No(55)	%	No(55)	%	No(55)	%		
Poor Knowledge Level (<60%)	49	89.1	2	3.6	5	9.1		
Fair Knowledge Level (60- 75%)	6	10.9	14	25.5	13	23.6	99.366*	<0.001*
Good Knowledge Level (> 75%)	0	0.0	39	70.9	37	67.3		

Fr: Friedman test
p: p value to comparing between the studied periods

*: Statistically significant at $p \leq 0.05$

Table (4): Difference in Mean Score of Nurses' Care Practices for Patients undergoing PD, Observational Checklist (n = 55)

Nurses' Care Practices Items (grades)	Pre		Immediate		After 1 month		Test		Sig. bet. Periods		
	Mean	SD.	Mean	SD.	Mean	SD.	F	P	p1	p2	p3
Equipment preparation	19.65	4.85	35.02	4.53	34.89	6.38	375.954*	<0.001*	<0.001*	<0.001*	1.000
Preparation of patient and environment	15.55	3.50	31.98	2.67	30.76	3.61	436.724*	<0.001*	<0.001*	<0.001*	0.198
Nurse's practices before connect patient on PD	14.24	4.11	28.20	1.82	27.80	4.41	400.324*	<0.001*	<0.001*	<0.001*	1.000
Nurse's practices during connect patient on PD	31.95	7.84	55.55	6.99	55.15	7.28	473.733*	<0.001*	<0.001*	<0.001*	1.000
Nurse's practices to disconnect patient from PD	26.25	7.38	51.95	7.58	51.13	11.67	306.423*	<0.001*	<0.001*	<0.001*	0.776
Overall Practices	107.6	26.49	202.7	21.56	200.1	28.89	662.401*	<0.001*	<0.001*	<0.001*	0.153

F: F test (ANOVA) with repeated measures
p: p value to comparing between the studied periods
p1: p value to comparing between Pre and Immediate

p2: p value to comparing between Pre and After 1 month
p3: p value to comparing between Immediate and After 1 month
*: Statistically significant at $p \leq 0.05$

Table (5):   Distribution of the studied nurses according to level of nurses' care practices for patients undergoing PD observational checklist (n = 55)

Nurses' Care Practices Level	Pre Education Program		Immediate Education Program		After 1 Month Education Program		Fr	P
	No(55)	%	No(55)	%	No(55)	%		
Poor Care Practices Level (<60%)	47	85.5	1	1.8	4	7.2		
Fair Care Practices Level (60- 75%)	8	14.5	16	29.1	15	27.3	99.366*	<0.001*
Good Care Practices Level (> 75%)	0	0.0	38	69.1	36	65.5		

Fr: Friedman test, p; p value for comparing between the studied periods, *: Statistically significant at p ≤ 0.05

Table (6): Correlation between Nurses' Knowledge and Care Practices (n = 55)

		Practices		
		Pre	Immediate	After 1 month
Knowledge	R	0.835*	0.819*	0.852*
	P	<0.001*	<0.001*	<0.001*

r: Pearson coefficient, * : Statistically significant at p ≤ 0.05

Table (7):   Relation between Studied Nurses' Care Practices and their Characteristics (n = 55)

Nurses' Socio- Demographic		Nurses' Care Practices (total grade 244)		
		Pre	Immediate	After 1 months
		Mean ± SD	Mean ± SD	Mean ± SD
Age (years)	20 ≥ 30	111.05 ± 31.33	200.33 ± 23.40	195.76 ± 29.34
	31 ≥ 40	103.44 ± 19.98	203.0 ± 18.74	201.44 ± 27.53
	41 ≥ 50	111.67 ± 24.66	207.50 ± 19.20	205.50 ± 25.66
	51 ≥ 60	96.50 ± 34.39	199.25 ± 35.02	194.25 ± 46.59
F(p)		0.581 (0.630)	0.306 (0.821)	0.474 (0.702)
Gender	Male	108.26 ± 16.65	203.89 ± 19.66	201.26 ± 29.20
	Female	107.31 ± 30.66	202.06 ± 22.74	199.44 ± 29.13
t(p)		0.150 (0.881)	0.298 (0.767)	0.220 (0.827)
Marital status	Single	96.90 ± 10.26	201.25 ± 17.08	198.60 ± 22.76
	Married	119.07 ± 29.41	207.93 ± 20.50	205.32 ± 29.01
	Divorced	81.75 ± 13.43	172.50 ± 24.95	164.75 ± 29.03
	Widow	107.0 ± 40.95	203.67 ± 30.66	201.00 ± 44.68
F(p)		0.626 (0.591)	0.381 (0.845)	0.311 (0.792)
Level of education	Nursing session	85.67 ± 23.03	169.67 ± 3.21	159.33 ± 13.28
	Secondary Nursing School	99.75 ± 22.14	205.44 ± 23.61	204.63 ± 28.98
	Nursing Institute	109.24 ± 21.96	198.20 ± 19.57	193.32 ± 28.50
	Nursing college	121.45 ± 36.48	217.91 ± 10.38	214.91 ± 13.60
F(p)		2.353 (0.083)	5.874* (0.002*)	5.342* (0.003*)
Hospital Setting	AL-Karama Teaching Hospital	104.90 ± 21.57	198.60 ± 23.73	194.90 ± 35.17
	AL-Yarmook Teaching Hospital	123.67 ± 34.01	207.44 ± 21.90	205.56 ± 31.36
	AL-Kadhmiyia Teaching Hospital	112.0 ± 24.57	211.09 ± 16.41	206.82 ± 22.64
	AL-Kindy Teaching Hospital	99.15 ± 28.24	196.08 ± 22.91	192.92 ± 30.06
	Baghdad Teaching Hospital	103.08 ± 21.47	202.0 ± 22.31	201.83 ± 27.58
F(p)		1.385 (0.252)	0.921 (0.459)	0.502 (0.734)
Years of Experience in hospital	1-5 years	104.41 ± 28.77	199.06 ± 20.83	194.35 ± 29.26
	6-10 years	111.0 ± 27.05	200.44 ± 22.51	197.50 ± 27.83
	11-15 years	105.18 ± 13.16	208.36 ± 14.91	207.27 ± 23.86
	16-20 years	111.0 ± 40.02	205.50 ± 29.05	203.50 ± 38.83
	More than 20 years	108.0 ± 31.32	210.33 ± 33.20	209.00 ± 39.66
F(p)		0.172 (0.952)	0.461 (0.764)	0.533 (0.712)
Years of experience in peritoneal dialysis	1-5 years	107.47 ± 30.73	200.63 ± 20.27	196.53 ± 28.44
	6-10 years	107.67 ± 21.41	202.25 ± 20.92	200.38 ± 27.05
	11-15 years	107.83 ± 30.69	206.83 ± 25.84	205.08 ± 34.57
F(p)		0.001 (0.999)	0.305 (0.738)	0.317 (0.730)
Number of training sessions in peritoneal dialysis	None	93.40 ± 7.27	189.73 ± 20.17	183.60 ± 24.68
	1	104.94 ± 29.12	205.65 ± 18.45	202.76 ± 26.01
	2	123.90 ± 20.47	209.10 ± 16.63	208.80 ± 24.05
	3	94.43 ± 21.28	203.0 ± 28.45	197.71 ± 38.61
	4 or more	139.17 ± 28.67	215.67 ± 22.45	220.17 ± 28.19
F(p)		6.522* (<0.001*)	2.433 (0.059)	2.535 (0.052)
Place of training Sessions in peritoneal dialysis	Inside Iraq	99.92 ± 21.56	201.88 ± 21.13	198.12 ± 28.47
	Outside Iraq	118.80 ± 30.67	212.80 ± 8.04	208.00 ± 16.90
	Both	147.44 ± 16.96	221.0 ± 15.49	217.56 ± 29.24
	None	93.40 ± 7.27	189.73 ± 20.17	183.60 ± 24.68
F(p)		17.963* (<0.001*)	5.416* (0.003*)	5.615* (0.002*)

SD: Standard deviation, t: Student t-test, F: F for One way ANOVA test, *: Statistically significant at p ≤ 0.05

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