

Assessment of Nurses' Performance Regarding Care of Children Undergoing Hemodialysis Therapy

*Mahmoud Abd Elkhalik Ibrahim, **Wafaa El-Sayed Ouda, *Safaa Salah Ismail

* Pediatric Nursing Department, Faculty of Nursing, Helwan University.

** Pediatric Nursing Department, Faculty of Nursing, Ain shams University

Abstract

Background: Chronic kidney disease (CKD) is the major health problem worldwide. Hemodialysis is the most common method used to treat the advanced and permanent kidney failure. The pediatric nurse plays an important role in management of child undergoing hemodialysis therapy. **Aim of the study:** 1) Assessment of nurses' knowledge regarding care of children undergoing hemodialysis therapy. 2) Assessment of nurses' practice regarding care of children undergoing hemodialysis therapy. 3) Assessment of nurses' attitude regarding care of children undergoing hemodialysis therapy. **Research design:** A descriptive design was utilized. **Methods:** All available nurses (50) working in hemodialysis units affiliated to both Cairo University (Abu El-Rish Child Hospital) and Ain Shams University Hospitals. **Tools:** Data were collected through three main tools; Self-administered questionnaire sheet, observational checklists and attitude rating scale to assess nurses' performance regarding care of children undergoing hemodialysis therapy. **Results:** The main results of study demonstrated that the mean age of the studied nurses was 30 ± 8.357 years and the mean years of experience were 9.1 ± 6.36 years, the majority of them had satisfactory level of knowledge, incompetent level of practice and had negative attitude regarding care of children undergoing hemodialysis therapy. **Conclusion:** Nurses had satisfactory level of knowledge, incompetent level of practice, and negative attitude regarding care of children undergoing hemodialysis therapy. There was no a statistically significance relation between total scores of nurses' performance (knowledge, practice and attitude). **Recommendations:** Periodic assessment of knowledge, practice and attitude for all nurses dealing or providing care to children undergoing hemodialysis therapy and procedure book should be available in hemodialysis units as a reference for all nurses.

Key words: Children, Hemodialysis, Nurses, Performance, Renal failure.

Introduction

Kidney is one of the most important organs in the body, which is responsible mainly for excretion of waste products and regulation of body fluids and electrolytes and produce hormones. In a healthy body the kidney functions go properly, while due to some

defects the kidney may be affected negatively (Rizzo, 2015).

Chronic renal diseases (CRD) defined as: "evidence of structural or functional kidney abnormalities (abnormal urine analysis, imaging studies, or histology) that persist for at least 3 months, with or without a decreased of glomerular filtration rate

(GFR), less than 60 ml/minute/1.73 m² (**Webster et al., 2017**).

In Egypt, the estimated annual incidence of end stage renal disease (ESRD) is around 74/million and the total prevalence of children on dialysis is 264/million (**El-Arbagy et al., 2016**).

End stage renal disease is defined as total loss of kidney function, it is a common problem worldwide, and it is diagnosed by several laboratory and imaging diagnostic procedures. It occurs when a disease or condition impairs kidney function, causing kidney damage to worsen over several months or years. This includes; diabetes mellitus, hypertension, obstructed urine flow, kidney diseases, kidney artery stenosis, certain toxins, fetal developmental problem, systemic lupus erythematosus, overuse of some medications such as non-steroidal anti-inflammatory drugs (NSAIDs), and kidney injury (**Kolvek, 2014**).

The goal of management of chronic renal failure (CRF) in children is not only to prevent progression to ESRD but to fulfill the physiological and emotional needs of children to the best possible quality of life. It can achieve through early and appropriate treatment of reversible causes of chronic renal failure. It may help to achieve normal growth, development and periodic monitoring for rate of progression to end stage renal disease to help plan for renal replacement therapy (**Sajid et al., 2014**).

Medical management of chronic renal failure includes dialysis to remove waste products and extra water from the blood. There are two types of dialysis; hemodialysis and peritoneal dialysis. Kidney transplantation involves surgically placing a healthy kidney from a

donor inside the children body that is used when there is no life threatening medical condition other than kidney failure (**Levy et al., 2016**).

Hemodialysis is the most common method used to treat advanced and permanent kidney failure in pediatrics. Hemodialysis defined as a medical procedure that uses a special machine to filter waste products from the blood and to restore normal constituents to it again (**Kallenbach, 2015**).

Chronic hemodialysis has many complications as cardiovascular, nutritional, gastrointestinal, hepatic, endocrinal, complications of arterio-venous fistula (AV), infections, nervous system & sleep disorders (**Brunner & Suddarth's, 2013**).

The dialysis nurse plays a vital role in providing information, care, support, understanding and therapeutic counseling to the pediatric patient and his family throughout the entire illness. The nursing management must be provided in order to reducing the complications of renal function and the stresses of dealing with a life threatening illness (**James et al., 2014**).

Significance of the study

Chronic kidney disease is a worldwide public health problem; approximately 18/1million of children suffers from renal failure all over the world. The reported prevalence of chronic renal failure in children in Egypt is 225 / million populations (**Safouh et al., 2015**). Nurses can help by involving the pediatric patient as much as possible in their health care decision, informing them of all treatment options and placing an emphasis on self-care. Sometimes nurses

fail to adopt modern or recent nursing care for the children undergoing hemodialysis due to the lack of knowledge (Barsoum, 2008). Therefore, this study has been carried out to assess of nurses' performance regarding care of children undergoing hemodialysis therapy.

Aim of the study:

This study aimed to assess nurses' performance regarding care of children Undergoing hemodialysis therapy. This aim was achieved through the following:

1. Assessment of nurses' knowledge regarding care of children undergoing hemodialysis therapy.
2. Assessment of nurses' practice regarding care of children undergoing hemodialysis therapy.
3. Assessment of nurses' attitude regarding care of children undergoing hemodialysis therapy.

Research question

To fulfill the aim of this study the following research question was formulated:

What are the nurses' knowledge, practices and attitudes regarding care of children undergoing hemodialysis therapy?

Subject and Methods:

I. Technical Design:

The technical design for the study included; research design, setting of the study, subjects as well as tools of data collection.

A) Research design:

A descriptive design was utilized for conducting the study.

B) Setting:

This study was conducted at hemodialysis units affiliated to both Cairo University (Abu El-Rish Child Hospital) and Ain Shams University Hospitals. The hemodialysis unit at Abu El-Rish Child Hospital was located on the fourth floor. This unit divided into 4 parts, First part of the chronic hemodialysis room which included 12 hemodialysis machines (8 for negative pediatric patients and 4 machines for positive hepatitis c pediatric patients). Second part included 3 machines for acute cases. Third part included 4 beds in intensive care and 6 beds in intermediate care. Fourth part included 6 beds in the peritoneal dialysis room. While, the hemodialysis unit at Ain Shams University Hospitals were located on the first floor. There were 21 hemodialysis machines in chronic hemodialysis room and 3 machines for positive hepatitis c pediatric patients.

C) Subjects:

A convenience sample composed of 50 nurses was included in the study from the previously mentioned settings where; 26 from Cairo University (Abu El-Rish Child Hospital) and 24 from Ain Shams University Hospitals. The study included nurses from both genders, with different groups, educational levels and years of experience.

D) Tools of data collection:

Three tools were used for data collection:-

Tool I: Nurses' self-administered questionnaire:

Assessment of Nurses' Performance Regarding Care of Children Undergoing Hemodialysis Therapy

This tool was developed by the researcher based on review of literature in an Arabic language to suit the nurses' level of understanding and divided into two parts:

A) Demographic characteristics of nurses: The studied nurses' characteristics such as age, gender, level of education, years of experience and previous training courses.

B) Nurses' knowledge: To assess nurses' knowledge regarding care of children undergoing hemodialysis therapy through this tool which included 26 questions about definition, indication, contraindication, complications of hemodialysis and preventive measures and care before, during and after the hemodialysis procedure. The scoring system of total knowledge about hemodialysis is a score of two was given for correct answer and one for incorrect answer. The scores of items were summed up and the total divided by number of the items, giving a mean score for the par. These scores were converted into a percent score. Means and standard deviations were computed. The nurses' knowledge was considered satisfactory if the percent score was 70% or more and unsatisfactory if scored less than 70%.

Tool II: Nurses' observation checklists (Appendix IV): This tool was adopted which included 89 steps and were used to assess nursing practices regarding care of children undergoing hemodialysis therapy (nursing care before, during and after the hemodialysis procedure, vital signs and growth measurements of the pediatric patient). The scoring system of these steps of nursing practices is a score of one was given for completely done (competent) and zero for not done (incompetent). The scores of items were summed up and total divided by number of the items, giving a mean score for the part. These scores were converted into a percent score. The nurses' practices considered competent if the percent score

was > 85% and incompetent if the percent score was <85%.

Tool III) Nurses' attitude rating scale (Appendix IV): it was consisted of 10 statements to assess nurses' attitude regarding care of children undergoing hemodialysis therapy. The studied nurses were asked to respond on 5-points Likert scale. The scoring system classified into; strongly agree was given a score of 5, agree was given a score of 4, neither / don't have an opinion was given a score of 3, disagree was given a score of 2, and strongly disagree was given a score of 1. The scores of the items were summed up and the total divided into: 10-23 (Negative attitude), 24-37 (Neither / Indifferent) and 38-50 (Positive attitude).

2- Operational design:

The operational design includes preparatory phase, content validity, pilot study and field work.

A) Preparatory phase:

It include reviewing of related literature and theoretical knowledge of various aspects of the study using books, articles, magazines to develop tools for data collection and internet periodicals.

B) Pilot study:

A pilot study was carried out on 5 nurses from the studied nurses to test the clarity, applicability, feasibility & relevance of the tools used and to determine the needed time for the application of the study tools. The nurses who were included in the pilot study were included to the sample because no modification was done after conducting pilot study.

C) Tools validity and reliability:

Content validity was tested through a panel of five experts (professors) from Faculty of Nursing, (3 from Faculty of Nursing, Ain Shams University and 2 from Faculty of Nursing, Cairo University) to ensure its validity for comprehensiveness, accuracy, clarity and relevance.

Content reliability was tested by using a Cronbach's Alpha of (78%) for studied nurses' knowledge regarding care of children undergoing hemodialysis therapy, (62%) for studied nurses' attitude rating scale and (81.1%) reliable for nursing practices before, during and after the hemodialysis procedure, vital signs and growth measurements of the pediatric patient.

D) Field work:

The actual field work of data collection has consumed 6 months starting from the first of March to the end of Augusts 2017. At the beginning, the researcher introduced herself to the studied nurses and explained the purpose of the study to gain their cooperation and to assure the studied nurse about anonymity of their answers and that the information will be used for scientific research only and was be strictly confidential.

The data collected through interview and observation the nurses individually to identify background information and evaluate their performance toward the children undergoing hemodialysis therapy. The collection of data was three days per week at morning and afternoon shifts in the previously mentioned settings during hemodialysis session by rotation. Each interview lasted 30 minutes.

The studied nurses were observed and evaluated for the care provided to the children undergoing hemodialysis therapy by

the observation checklist which filled by the researcher.

3- Administrative Design:

The necessary approval was obtained from the unit's directors. A letter was issued to them from the faculty of nursing, Helwan University explaining the purpose and to obtain the permission for conducting this study.

Ethical consideration:

The pediatric nurses assured that the collected data would be treated confidentially and that it would be used for the purpose of the study only. The purpose of the study was simply explained to the nurses who agree to participate in the study prior to data collection. The researcher assured maintaining anonymity and confidentiality of the subject data. Pediatric nurses were informed that they allowed choosing to participate or not in the study and that they have the right to withdraw from the study at any time without giving any reasons.

4- Statistical Design:

The collected data were organized, categorized, tabulated and statistically analyzed using the statistical package for social science (SPSS) version 20 to assess nurses' level of knowledge, practice and attitude regarding care of children undergoing hemodialysis therapy. Data were presented in tables and graphs. The statistical analysis included; percentage (%), chi-square (X^2), and pearson correlation (R)

The observed differences and associations were considered as:

- P. value > 0.05 no significance difference.
- P. value < 0.05 significance difference.

Assessment of Nurses' Performance Regarding Care of Children Undergoing Hemodialysis Therapy

Result:

Table (1): This table revealed that less than half of the studied nurses (44%) have between 20 < 30 years old ($X \pm SD$ 30 \pm 8.35 years), more than three quarters of them (78%) were females, less than half of them (46%) were have from 5 < 10 years of experience ($X \pm SD$ 9.1 \pm 6.36 years). Also, about three quarters of them (74%) had technical institute (diploma) and nearly two thirds of them (66%) have no previous training courses about care of children undergoing hemodialysis therapy.

Table(2): Regarding nurses' knowledge about chronic renal failure in children this table clarified that, more than half of the studied nurses (62%) had satisfactory level of knowledge regarding causes and risk factors of chronic renal failure, while less than half of them (46%) had unsatisfactory level of knowledge regarding definition of chronic renal failure.

Table (3): Regarding studied nurses' knowledge about hemodialysis therapy in children this table clarified that; less than three quarters of the studied nurses (72%) had satisfactory level of knowledge regarding side effects of hemodialysis, while, less than half of them (48%) had unsatisfactory level of knowledge regarding nursing care after hemodialysis session.

Table (4): Regarding nurses' level of practice about care of children undergoing hemodialysis therapy this table clarified that, more than half of the studied nurses had competent level of practice regarding measuring of blood pressure and pulse (66% and 60%) respectively, while more than half of them (56%) had incompetent level of practice regarding nursing care during hemodialysis session and measurement of body weight.

Table (5): Regarding nurses' attitude about care of children undergoing hemodialysis therapy this table clarified that, more than half of the studied nurses (56%) had negative

attitude, while only (6%) of them had positive attitude regarding care of children undergoing hemodialysis therapy.

Table (6): This table indicated that, less than half of the studied nurses (46.7%) who had satisfactory level of knowledge had competent level of practice. While, more than half of the studied nurses (60%) of the studied nurses who had unsatisfactory level of knowledge had incompetent level of practice. So, there were no statistically significant relation between the nurses' level of knowledge and level of their practice ($p \geq 0.05$).

Table (7): This table reveals that, nearly two thirds of the studied nurses (65%) who had unsatisfactory level of knowledge had negative attitude. While, half of the studied nurses (50%) who had satisfactory level of knowledge had negative attitude. So, there were no statistically significant relation between the nurses' level of knowledge and their attitude regarding care of children undergoing hemodialysis therapy ($p > 0.05$).

Table (8): This table shows that, more than half of the studied nurses (63.6%) who had a competent level of practice had negative attitude. Well, half of them (50%) who had an incompetent level of practice had negative attitude. So, there were no statistically significant relation between the studied nurses' level of practice and their attitude ($p \geq 0.05$).

Figure (1): It was obvious from this figure that, more than half of the studied nurses (60%) had satisfactory level of total knowledge, while less than half of them (40%) had unsatisfactory level of total knowledge regarding care of children undergoing hemodialysis therapy.

Figure (2): It was obvious from this figure that, more than half of the studied nurses (56%) had incompetent level of total practice regarding care of children undergoing hemodialysis therapy, while less than half of them (44%) had competent level of total

Table (1): Number and percentage distribution of the studied nurses regarding to their characteristics (n=50).

Items	Number	Percentage
Age / year		
0<20	5	10
20 < 30	22	44
30 < 40	13	26
≥ 40	10	20
X ± S.D		30 ± 8.35
Gender		
Male	11	22
Female	39	78
Years of Experience		
<1 year	8	16
1 < 5	7	14
5 < 10	23	46
≥10 years	12	24
X ± S.D		9.1 ± 6.36
Level of Education		
Technical institute(Diploma)	37	74
Bachelor degree	13	26
Post graduate	0	0.0
Training courses		
Yes	17	34
No	33	66

Table (2): Number and percentage distribution of the studied nurse's knowledge regarding to chronic renal failure in children (n=50).

Items	Satisfactory		Unsatisfactory	
	No	%	No	%
Definition of chronic renal failure	27	54	23	46
Causes and risk factors of chronic renal failure	31	62	19	38
Diagnosis of chronic renal failure	28	56	22	44
Treatment of chronic renal failure	29	58	21	42

Table (3): Number and percentage distribution of the studied nurse's knowledge regarding to hemodialysis therapy in children (n=50).

Items	Satisfactory		Unsatisfactory	
	No	%	No	%
Definition of hemodialysis	31	62	19	38
Indications and precautions for hemodialysis	29	58	21	42
Side effects of hemodialysis	36	72	14	28
Complications of hemodialysis	31	62	19	38
Nursing care before hemodialysis Session	32	64	18	36
Nursing care during hemodialysis Session	31	62	19	38
Nursing care after hemodialysis Session	26	52	24	48

Assessment of Nurses' Performance Regarding Care of Children Undergoing Hemodialysis Therapy

Table (4): Number and percentage distribution of the studied nurse's level of practice regarding to care of children undergoing hemodialysis therapy (n=50).

Items	Competent		Incompetent	
	No	%	No	%
Nursing care before hemodialysis session	29	58	21	42
Nursing care during hemodialysis session	22	44	28	56
Nursing care after hemodialysis session	28	56	22	44
Measurement of blood pressure	33	66	17	34
Measurement of pulse	30	60	20	40
Measurement of respiration	23	46	27	54
Measurement of oral temperature	28	56	22	44
Measurement of axillary temperature	23	46	27	54
Measurement of body weight	22	44	28	56

Table (5): Number and percentage distribution of the studied nurse's attitude regarding care of children undergoing hemodialysis therapy (n=50).

Attitude Level	No	%
Positive Attitude	3	6
Neutral / Indifferent	19	38
Negative Attitude	28	56

Table (6): Relation between the studied nurse's total knowledge regarding care of children undergoing hemodialysis therapy and their practice (n = 50).

Knowledge	Practice				X ² test	
	Competent		Incompetent		X ²	P value
	No	%	No	%		
Satisfactory	14	46.7	16	53.3	0.216	0.650
Unsatisfactory	8	40	12	60		

Table (7): Relation between total level of the studied nurse's knowledge regarding care of children undergoing hemodialysis therapy and their attitude (n=50).

Knowledge	Attitude Level						X ² test	
	Positive		Neutral		Negative		X ²	P value
	No	%	No	%	No	%		
Satisfactory	2	6.7	13	43.3	15	50	1.099	0.353
Unsatisfactory	1	5	6	30	13	65		

Table (8): Relation between total level of the studied nurse’s practice regarding care of children undergoing hemodialysis therapy and their attitude (n=50).

Practice	Attitude Level						X ² test	
	Positive		Neutral		Negative		X ²	P value
	No	%	No	%	No	%		
Competent	2	9.1	6	27.3	14	63.6	2.224	0.648
Incompetent	1	3.6	13	46.4	14	50		

Figure (1): Percentage distribution of the studied nurse’s total knowledge regarding care of children undergoing hemodialysis therapy(n=50).

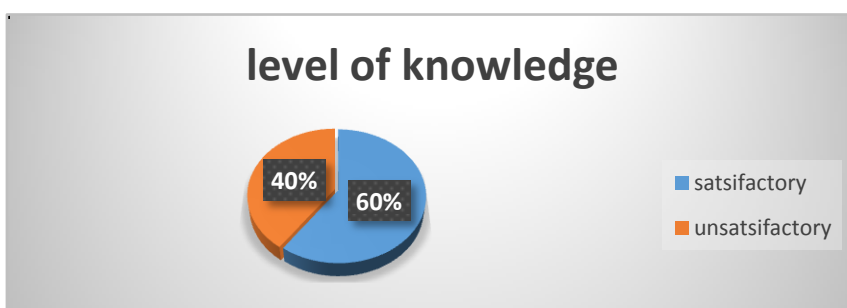
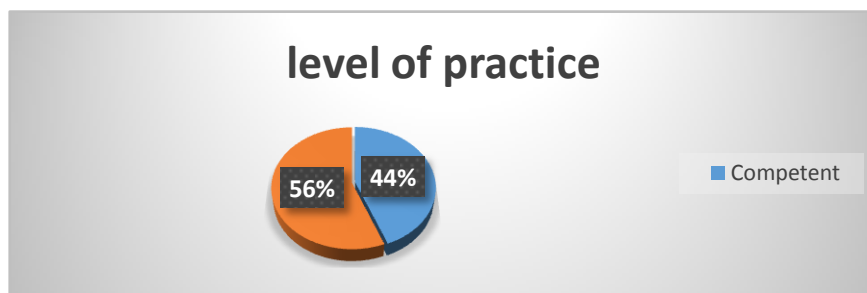


Figure (2): Percentage distribution of the studied nurse’s total practice regarding care of children undergoing hemodialysis therapy(n=50).



Discussion

Concerning to demographic characteristics of the studied nurses the current study results revealed that in table (1), less than half of them had age group between 20 < 30 years old ($X \pm SD$ 30 \pm 8.357

years). This finding was agreement with **Hassan, (2010)** in a study entitled "effect of designed nursing protocol on nurses' knowledge and practice regarding hemodialysis patients at Assiut hospitals", in Egypt, who found that the majority of the nurses working in hemodialysis units their ages ranged from 20 to 30 years old. While

these study nurses are in disagreement with **El-Moghazy, (2013)** who conducted a study entitled "Nurses' knowledge and practice regarding intradialytic complications for hemodialysis patient", in Egypt, who found that more than half (52.5%) of nurses were aged thirty years or above with $X \pm SD$ 34.2 ± 10.3 years. This result may be due to most of the studied nurses were newly graduated after technical institute of nursing.

In relation to the studied nurses' gender, the current study showed in table (1) that, more than three quarters of the studied nurses were females. This result in the same line with **Abdelsatir, (2013)** in a study entitled "Evaluation of nurses awareness and practice of hemodialysis access care in Khartoum State", in Sudan, who reported that the majority of the nurses (72%) were females but this finding is in disagreement with **Bakey, (2014)** in a study entitled "Evaluation of nurses practices throughout hemodialysis treatment for patients in hemodialysis unit at Baghdad teaching hospitals", in Iraq, who stated that the majority of studied nurses (53.3%) were males. This may be due to the greater fraction of the nurses in Egypt was females and may also related to the studying of nursing in Egyptian universities were exclusive for females only till few years ago.

As regard of years of experience it was noticed in table (1) that, less than half of the studied nurses had experience ranged from $5 < 10$ years. This study agreement with **Hassan, (2010)** who stated that more than three quarters (85.8%) of the nurses their experiences range from 5 to 10 years. This result may be due to most of the studied nurses were recently graduated, severity of children condition, increase hours of work and occupational hazards that facing the nurses in hemodialysis units.

It was clear in table (1) that, more than two thirds of the studied nurses were had technical institute degree (diploma). This finding was agreement with **Hassan, (2010)**

who found nearly two thirds (65.7%) of studied nurses had technical institute degree also in the same line this finding was agreement with **Al-Mawsheki, (2016)** in a study entitled "Nurses' knowledge and practice regarding care for the patients during hemodialysis", in Egypt, who reported that more than one half (58%) of studied nurses had technical institute degree. From the researcher point of view, this might be due to a lot of bedside nurses in governmental hospitals were diploma and technical nurses because bachelor nurses in the governmental hospitals are working as head nurse.

As regard attending training courses it was found in table (1) that, nearly two thirds of them have not previous training courses about care of children undergoing hemodialysis therapy. This result agreement with **Al-Mawsheki (2016)**, who reported that the nearly two thirds (60%) of studied nurses did not attend training course about patients care in hemodialysis unit. This may be related to shortage of staff, work load in hemodialysis units.

Regarding nurses' total level of knowledge about chronic renal failure and hemodialysis, it was noticed in figure (1) that, less than three quarters of the studied nurses had satisfactory knowledge related to hemodialysis therapy. This result agreement with **Al-Mawsheki, (2016)** who found that more than three quarters (90%) of studied nurses who worked in hemodialysis units had satisfactory knowledge about hemodialysis therapy. This finding may be explained by the most of studied nurses had new graduation and had fresh information.

Concerning nurses' total level of practice about care of child undergoing hemodialysis therapy, findings of this study documented from figure (2) that, more than half of the studied nurses had incompetent practice regarding care of child undergoing hemodialysis therapy. These findings in agreement with **Hassona, (2011)** in study entitled " Evaluation of an educational

program: A report from the hemodialysis unit in Zagazig University Hospitals", in Egypt who found that all studied nurse, had unsatisfactory practice regarding care for children during hemodialysis but this finding in disagreement with **Al-Mawsheki, (2016)** who found that more than half of studied nurses (56%) had satisfactory level of practice regarding care in hemodialysis therapy.

The researcher point of view, it might be due to the lack of nurses' application of knowledge especially regarding nursing interventions with common complications that occur and misunderstanding of their roles as there is no job description or definition of responsibilities in the hemodialysis unit.

Regarding nurses' attitudes, this study showed in table (5) that, more than half of nurses had negative attitude regarding care of child undergoing hemodialysis. This study disagreement with **Mahmoud, (2015)** in a study entitled "knowledge, attitudes and practices of care givers of children with end stage renal disease on hemodialysis at Abu El Rish Pediatric University Hospital", in Egypt, who found that two thirds of the caregiver had positive attitude. From the researcher point of views, it might be due to the stress of work and severity of children condition in hemodialysis units.

As regard to studying the relation between studied nurses' knowledge and practice about care of children undergoing hemodialysis therapy, the current study revealed that in table (9), there were no a statistically significant relation between nurses' knowledge and practice. All studied nurses who had unsatisfactory level of knowledge had competent level of practice. These study agreement with **Abdelfatah, (2013)** who found that there were no statistical significant difference between the nurses' knowledge scores and their practice. This finding may be due to studied nurses had satisfactory level of knowledge and don't implement this knowledge in their

work.

By studying the relation between studied nurses' knowledge and attitude toward care of children undergoing hemodialysis therapy, the current study revealed that in table (10), there were no statistically significant relation between the nurses' level of knowledge and their attitude regarding care of children undergoing hemodialysis therapy. Nearly two third of the studied nurses who had unsatisfactory level of knowledge had negative attitude. These findings were agreement with **Mahmoud, (2015)** who found that significant negative relation between respondent caregiver's knowledge and their attitude. This result may be due to the studied nurses don't implement this knowledge to deal with children undergoing hemodialysis therapy.

Regarding the relation between nurses' practice and attitude toward care of children undergoing hemodialysis therapy, the current study revealed that in table (11); there were a statistically significant relation between studied nurses' practice and their attitude. More than half of the studied nurses who had competent level of practice had negative attitude. These findings were in line with **Mahmoud, (2015)** who found that no statistical significant relation between caregiver's knowledge, attitude, and practice toward care of children undergoing hemodialysis therapy. This finding may be due to the studied nurses had incompetent level of practice which effected on their attitude.

Conclusion

The majority of the studied nurses had satisfactory level of knowledge. However, the majority of them had unsatisfactory level of practice and had negative attitude regarding care of child undergoing hemodialysis therapy. There were no statistically significance relation between total level of the studied nurses' knowledge and their practice, Also, no statistically significant relation between the total level of studied nurses' knowledge and their attitude, and there were no a statistically significant relation between studied nurses'

practice and their attitude regarding care of children undergoing hemodialysis therapy. Also, there were no a significant correlation between nurses' level of knowledge, practice and their characteristics but there were significant correlation between nurses' level of attitude and their characteristics.

Recommendation:

The results of this study projected the following recommendations:

The results of this study projected the following recommendations:

- Periodic assessment of knowledge, practice and attitude for all nurses dealing or providing care to children undergoing hemodialysis therapy.
- Emphasize the importance of continuous training based on actual need assessment of nurses caring for children undergoing hemodialysis therapy.
- Improving nurses' attitude toward nursing care of children undergoing hemodialysis therapy.
- Assess study factors affecting nurses' performance positively for better quality of pediatric patient undergoing hemodialysis therapy.
- Procedure book should be available in hemodialysis units as a reference for all nurses.

References

Abdelsatir S. (2013): Evaluation of Nurses Awareness and Practice of Hemodialysis Access Care in Khartoum State, Sudan. Arab Journal of Nephrology and Transplantation, 6: 119-21, 2013.

Abraham, G., & George, T. K. (2016): 15 Therapy in Chronic Kidney Disease Patients. Manual of Nephrology, 325.

Ahmed, F.A. (2009): Quality of Nursing Care for High Risk Neonate Receiving Nasogastric Tube Feeding, Benha University, Pp. 75-79. Retrieved from

<https://www.researchgate.net/publication/278375793> Quality of Nursing Care for High Risk Neonate Receiving Nasogastric Tube Feeding. Accessed on 12 Feb. 2016.

Ali S.R. (2013): Assessment of Nurses' Knowledge and Practice Provided to the Patients Under Going Hemodialysis at Cairo University Hospital. Unpublished Master Thesis, Department of Medical Surgical Nursing Science. Faculty of Nursing, Cairo University, 2013.

Al-Mawsheki, E., IBRAHIM, M. H., & TAHA, N. M. (2016): Nurses' Knowledge and Practice Regarding Care for the Patients during Hemodialysis. Med J Cairo Univ, 84(1), 1135-41.

Abdelfatah, A. H., Ahmad, A. R., & Zaky, F. (2013): Assessment of Nurses' Knowledge and Practice Related to Nursing Care of Children Undergoing Hemodialysis at Assiut City. Unpublished master Thesis. Faculty of nursing, Pediatric nursing department, Assiut University, 2013.

Bakey S.J. (2014): Evaluation of Nurses' Practices throughout Hemodialysis Treatment for Patients in hemodialysis unit at Baghdad teaching hospitals. Kufa Journal for Nursing Sciences, 2: 2, 2014.

Chamney, M., Podham, M., & Anderson, J. (2016). 16 Chronic kidney disease (CKD). Chronic Care Nursing, 240. College of Nursing, 2004.

El-Arbagy, A. R., Yassin, Y. S., & Boshra, B. N. (2016). Study of prevalence of end-stage renal disease in Assiut governorate, upper Egypt. Menoufia Medical Journal, 29(2), 222.

Hassan GA, (2010): Effect of designed nursing protocol on nurses knowledge and practice regarding hemodialysis patients at Assiut hospitals. Unpublished

master Thesis. Faculty of nursing, Adult nursing department, Assiut University.

Hassona F.M.H.: Evaluation of an Educational Program: A Report from the Hemodialysis Unit in Zagazig University Hospitals, Egypt. *Nephrology Nursing Journal*, 39: 53, 2011. <http://doi.org/10.9790/1959-0605061217>

James, S. R., Nelson, K., & Ashwill, J. (2014): Nursing Care of Children-E-Book: Principles and Practice. Elsevier Health Sciences.

Kallenbach, J. Z. (2015): Review of Hemodialysis for Nurses and Dialysis Personnel-E-Book. Elsevier Health Sciences.

Kolvek, G. (2014): Etiology and prognosis of chronic kidney disease in children: Roma ethnicity and other risk

Rizzo, D. C. (2015): Fundamentals of anatomy and physiology. Cengage Learning.

Webster, A. C., Nagler, E. V., Morton, R. L., & Masson, P. (2017): Chronic kidney disease. *The Lancet*, 389(10075), 1238-1252.