

Nurses' Knowledge towards Patients' Safety and Reducing Errors in Pediatric Hemodialysis Centers

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Abstract: Objective(s): The study's objective is to evaluate nurses' knowledge toward caring children with chronic renal failure and socio-demographic characteristics.

Methodology: A descriptive, non-probability (purposive) sample of A nurses working in the hemodialysis centers in Tikrit teaching hospital and the hemodialysis department in Balad general hospital in Salah Alden governorate, Iraq. The study started from September 7th, 2023, to March 5th, 2024, utilizing purposive sampling non probability.

Instruments: The study sample was collected by questioners to evaluate nurses' knowledge during caring child with chronic renal failure.

Results: The results showed that most of the study samples were female, and the majority of them were between the ages of 25 and 30. one third of participants hold bachelor degree in nursing. Most of them were employees (1-3) years were employment in nursing and in Hemodialysis Department. The findings of the current assessment revealed that nurses have moderate level of knowledge toward caring children with chronic renal failure with mean of the score (1.66). While, the study's findings showed that no existent statistically relationship among the nurses' knowledge and demographics characterizes.

Recommendation: We recommend applying the tested interventional program and raising hemodialysis nurses' knowledge and practice about patients' safety and reducing errors for children with chronic renal failure and assessment.

Key points: Pediatric hemodialysis, Nurses' knowledge, Patient safety, Error reduction, Quality improvement.

Introduction:

Chronic kidney disease (CKD) is a prevalent condition that affects individuals across many age groups, but it is more frequently observed in the elderly population. the estimated probability of Stage 3–5 CKD in the population of the United Kingdom ranges from 5.4% to 8.5%. Although not all individuals will develop end stage illness. There has been a constant rise in the number of individuals requiring renal replacement treatment in recent years, primarily due to the ageing population(1). Dialysis is considered a fundamental component of treatment for the majority of individuals diagnosed with Stage V chronic kidney disease, also known as ESRD, as well as a significant number of patients. Suffering from Acute Kidney Damage (AKI). As a result, it is crucial that doctors who are responsible for the management of these individuals. It is important for patients to comprehend the basic concepts of Dialytic treatments, particularly those with a biologic

component, the fundamental principle or foundation upon which something is established or developed (2)(3).

Pediatric hemodialysis employs comparable principles to those of adult hemodialysis, but necessitating modifications to cater to the unique requirements of children. The length and frequency of hemodialysis treatments might vary depending on the specific needs of each patient. Moreover, peritoneal dialysis is often contemplated as an alternative treatment option for pediatric patients owing to its adaptable nature and appropriateness for home-based management (4)

In the Hemodialysis Department, nurses are crucial because their knowledge and committed care have a big influence on how well patients who are receiving hemodialysis are doing. Starting with patient evaluation and vascular access management, nurses have a variety of critical duties as frontline healthcare workers. During dialysis sessions, they carefully observe patients' vital signs, fluid balance, and electrolyte levels to ensure the safe removal of waste materials and surplus fluids from the circulation(5).

Methodology:

Study Design:

A descriptive, non-probability (purposive) sample of A nurses working in the hemodialysis department. study was conducted from September 1, 2023, to March 5, 2024. A total of 48 nurses were recruited for this study using a convenience sample size. Setting of the study.

Setting of the Study:

The study carried out in the Salah Alden governorate is one of the Iraqi governorates north of the capital city Baghdad. The study was applied as a (study and control group) in tow hemodialysis units from tow hospital, one from Tikrit city (Tikrit teaching hospital). As for the other hospital (Balad general hospital). all these hospitals are affiliated to the Iraqi Ministry of Health \Salah Al-Din Health directors.

The Sample of the Study:

To represent the research, sample a non-probability of 54 nurse work in hemodialysis center participated in the study.

Instrument of the Study:

To evaluate the nurse's knowledge toward reducing errors and improve patient safety in hemodialysis. the researcher has constructed the study instrument based in the review of literature and previous study the study instrument consists of two part that include

Part I: The sociodemographic characteristics of the nurses who participate in the present study consist of age, gender, educational level, years of experience in hospitals, years of experience in the hemodialysis department, and participation in the training course

Part II: Nurses knowledge about caring for children with chronic renal failure This part was consistent with 45 questions in general information sign and symptoms cause risk. Factor complication diagnosis treatment prevention measures.

Validity of the Instrument:

The early produced instrument's content validity was established by using a panel of experts to examine the content and assess the questionnaire's clarity, relevance, and appropriateness in order to meet the study's objectives. The content validity was assessed by evaluating multiple-choice questions and an intervention program with a panel of 13 experts. The experts were given a copy of the study instrument, which included the intervention program and multiple-choice questions. They were then asked to review and assess the instrument in terms of its content's clarity and adequacy. Alterations and revisions were implemented in accordance with the advice and recommendations provided by the experts. Several topics were omitted, while others were included following a thorough assessment of all comments and recommendations.

Reliability of the Instrument:

A pilot study is a study conducted in order to evaluate feasibility, estimate the time needed for data collection, cost, adverse events, and improve upon the study design prior to the performance of a full-scale research project. The internal consistency method was applied for the purpose of determining the reliability of the questionnaire through the computation of the Alpha Correlation Coefficient (Cronbach's alpha) was (0.701).

Statistical Methods:

The researcher used the statistical package for social sciences (SPSS) version 24 software to manage and analyze the study data. Both descriptive and inferential analysis for the date of the samples

Results of the Study:**Table 1 the sociodemographic characteristics**

Classes	Groups	Study sample (48)	
		Frequency	percent
Age (Years)	20-less than 25	19	39.6
	25-less than 30	21	43.8
	30-less than 35	4	8.3
	35_or more	4	8.3
	Total	48	100.0
Gender	Male	14	29.16
	Female	34	70.84
	Total	48	100.0
Level of Educational:	Nursing Preparatory school graduate	18	37.3
	Institute graduate	17	35.5
	Nursing college graduate	13	27.2
	High study	0	0.0
	Total	48	100.0
Years of experience of nurses the hospital	Less than one year	4	8.3
	1 year and less than 3 years	22	45.8
	3 years and less than 5 years	9	18.7
	More than 5 years	13	27.2
	Total	48	100.0
Years of experience of nurses in the hemodialysis department	Less than one year	6	12.5
	1 year to less than 3 years	30	62.49
	3 years to less than 5 years	8	16.71
	More than 5 years	4	8.3
	Total	48	100.0
Participation of nurses in the dialysis training course	Not sharing	25	51
	One training course	17	32.40
	Two training courses	2	8.3
	More than 3 course	4	8.3
	Total	48	100.0

Table (2): Nurses' knowledge scores for the study sample according to the Nurses' knowledge about caring children with chronic renal failure (N=48).

NO.	Questions	Descriptive Statistics			
		MS	SD	RII	Ass.
Overall, for Nurses' level of Knowledge (N=45)		1.6611	.3872	0.83	High

MS.: Mean of Scores (weighted mean); Sd: Standard Deviation, RII.: Relative Importance Index, Ass.: Assessment, Low: (1.0- 1.33), Moderate (1.34- 1.66), High (1.67 - 2).

Table (3): Relationship between Nurses' knowledge and Socio-demographic characteristic.

		knowledge						
		Sum of Squares	df	Mean Square	F	Sig.	T_value	Ass.
Age	Between Groups	6.524	3	2.175	1.384	.277	3.182	N/S
	Within Groups	31.434	20	1.572				
	Total	37.958	23					
Gender	Within Groups	37.832	22	1.720			2.074	N/S
	Between Groups	.127	1	.127	.074	.789		
	Total	37.958	23					
Level of Educational	Between Groups	.244	2	.122	.068	.935	4.303	N/S
	Within Groups	37.714	21	1.796				
	Total	37.958	23					
Years of experience of nurses the hospital	Between Groups	8.408	2	4.204	2.988	.072	4.303	N/S
	Within Groups	29.550	21	1.407				
	Total	37.958	23					
Years of experience in hemodialysis department	Between Groups	9.514	3	3.171	2.230	.116	3.182	N/S
	Within Groups	28.444	20	1.422				
	Total	37.958	23					
Participation of nurses in the dialysis training course	Between Groups	5.326	3	1.775	1.088	.377	3.182	N/S
	Within Groups	32.632	20	1.632				
	Total	37.958	23					

Table (3) demonstrates the absence of a significant correlation between knowledge related to nursing management for hemodialysis patients and various demographic characteristics among the nurses in the study group. This conclusion is drawn from the table, where the significance values for

all items exceed 0.05, and the computed value is less than the table value, indicating a lack of association.

Discussion:

Discussion of Nurses' Socio demographic Characteristics.

The current study recorded data on the gender of nurses' distribution, females constitute the majority at more than three-quarter whereas males account for 1 quarter. (1). From the researcher's point of view, this result of the policy and the registration system of the Ministry of Higher Education and Research that gives preference to females for example the percentage of females is more than two-thirds and one-third for males. This result consistent with previous findings by Ahmed and Younus (2023)(6).in addition another previous study conducted by Mohammed Saeed and khatam Al-Mosawi. (2020) (7). And inconsistent with Serwan Bakey (2012) (8).

Regarding the age of participant of the current study. The sample mostly consist of participant in the middle age range of 25 to less than 30 years old.

This result consistent with previous findings of Hadi and Jumaa (2021) who studied in Baghdad teaching hospital about nurses' practice through Hemodialysis treatment they found more than half of nurses were less than 30 years old (9). and in same line with other studies of Serwan (2012) his study the study showed that the majority of the study sample were within age group (26 – 30) years old (8). differing from other reports by Ismael (2023) in Sulaimani city were investigate nurses' awareness regarding Hemodialysis procedures and complication. The study showed more than three quarter of nurses its less than 38 years old (10). And contrasting with previous research mona and Mohamed (2024) where it investigates nurses' knowledge and practice regarding preventive measures in Hemodialysis Department, they found the majority of nurses age was more than half of the dialysis nurses their age ranged between (20-25) years (11).

From the researcher point of view, it can be explained that the hemodialysis department needs new staff of nurses because the elderly nurses cannot meet the workload and responsibilities in the critical care units.

Regarding the education level, in the study more than one third of the participants are graduates' Nursing Preparatory school of nursing.

These findings disagree with previous reports of Hadi and Jumaa (2021) (9). In other hand reports of conducting by Ahmed and Younus (2023) (6).

The majority of participant was within 1-3 years of experience in nursing field in hospitals, and representing more than half with a slightly lower percentage of more than third in the control group.

This finding in the present study is supported by the result of Alhattab Waleed (2017) (12). And this result differing from other reports by Ahmed and Younus (2023) (6).

the researcher's opinion, due to hospital policy, nurses at the beginning of their employment work in a rotation system in most departments before they are appointed and according to need.

Discussion of the Nurses knowledge concerning caring children with chronic renal failure

The findings of the present study show that the majority had a high level of knowledge about caring for a child with chronic renal failure. The mean score for general knowledge about caring for a child with chronic renal failure was 1.66

This result agrees with a study conducted by Abd Elkhalik Ibrahim M, El-Sayed Ouda W, Salah Ismail S (2019) to evaluate nurses' performance regarding care of children with chronic renal failure the study found that the nurses' knowledge had satisfactory (13).

This result was disagreed upon by a study done by Wafaa Abd Ali, Kadhim, and Alaa Jawad (2021) to evaluate the impact of years of experience with nurses' knowledge and practice concerning infection control in critical care units. The study found that most participants had a fair to moderate level of knowledge(14).

In a similar study done by Saleh and Afifi (2018) to assess the impact of the educational program and intervention training on nurses' compliance with standards of nursing care for hemodialysis patients, quasi-experimental designs were carried out at Almina University Hospital in Egypt. The study found the nurses knowledge was fair(15).

Qasim Rajhi and widad kamil (2020) has disapproved this result of current study that the nurse's knowledge level had fair in their study conducted to evaluate effectiveness of educational program in intensive care unit and in the same line with Kim (2012) has approved these results (16).

In addition to another study conducted by Hassan Athbi and Wided Kamil (2012) to investigate the effect of educational programs on nurses' staff knowledge about infection control in the hemodialysis department, they found that the nurse knowledge had fair (17).

According to another study done by Mohammad Saeed and Khatam Al-Mosawi (2020), which investigated the effect of educational programs on nurses' knowledge in the pediatric hemodialysis department in Baghdad complex city, the study found an nurses' knowledge had fair level also(7).

Discussion of Relationship between Nurses' knowledge and Socio-demographic Characteristics.

The results of the study found that there is no relationship between nurses' knowledge and age, and this result agrees with Talal and Zahid's (2021) finding that there is no existing relationship between nurses' knowledge and demographic characteristics.(18). In the same line with bakey (2009), they found in their study that there was no statistically significant relationship between nurses' knowledge and age(19).

On the other hand, the result of Naba and Khitam (2023) found that there is a statistical relationship between nurses' knowledge and practice and their age and years of experience(20).

Conclusion:

According to the study's findings, most nurses have satisfactory information necessary to care for a child with chronic renal failure, but this is not enough to care for children with chronic renal failure.

Recommendation:

The study recommended that to expand the nurse's knowledge concerning caring the children with chronic renal failure and enhance patients' safety and reducing errors, hospitals should implement particular training programs relevant to the patient's safety and reduction errors. There is a need to encourage nursing staff to participate in the training courses and conferences special of the issues related to renal replacement therapy as well as lectures to update the information and develop the skills of nurses.

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