RESEARCH
O&G Forum 2024; 34 – 3s: 3088-3096

EFFECT OF NURSE-LED INTERVENTIONS IN ENHANCING NURSES' PRACTICES FOR INFECTION PREVENTION IN PEDIATRIC HEMODIALYSIS CENTERS

Ammar A. Fadhil[1], M.Sc. Zaid W. Ajil[2], PhD
[1]Ministry Of Health. College Of Nursing \ University of Baghdad. Pediatric Department
Email: ammar.abbas2206m@conursing.uobaghdad.edu.iq https://orcid.org/0009-0007-0748-5644
[2]Assist Prof. Pediatric Nursing Department. College Of Nursing \University of Baghdad
Email: zaid_ahjil@conursing.uobaghdad.edu.iq. https://orcid.org/0000-0003-0936-775X

Abstract:
Background: Chronic kidney disease 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%. Nurses play a pivotal role in hemodialysis due to their constant presence in healthcare settings. As such, a critical need exists for nurses with advanced knowledge, training, and expertise in hemodialysis. **Objective(s):** The current study aimed to investigate the effect on nurse-led intervention for enhancing nurses' practices toward infection preventions in pediatrics hemodialysis department. **Method**: The nurses' practices were assessed by an observational checklist. An NLEI was assessed with an observational checklist with 8 main domains in 76 subdomain practices related to hemodialysis procedures. The data was collected from 48 nurses working in the hemodialysis department. The data analysis using the statistical analysis package for social science (SPSS) version 24. **Instruments:** the data collection method makes use of the observational checklist, in which the researcher completes the questionnaire. **Results:** The study group pretest mean practices was 137.83 and the standard deviation was 6.57; the posttest1 mean was 221.41 and the standard deviation was 3.47; and the posttest2 mean practices was 229.66 and the standard deviation was 1.30. And for the control group, the study found that the pretest mean was 160.25 and the standard deviation was 5.16, the posttest1 mean was 160.58 and the standard deviation was 5.26, and the posttest2 mean was 160.41 and the standard deviation was 7.07. Conclusion: The study concludes that the Nurse-Led interventional program was effective in improving nurses' practices regarding caring for children with chronic renal failure. **Recommendation:** We recommend applying the tested interventional program and raising hemodialysis nurses' awareness about patients' safety and reducing errors for children with chronic renal failure and assessment.
Key words: *Pediatric hemodialysis, Nurses' practice, Patient safety, infection prevention, Quality improvement.*

What is currently Known?

Studies suggest healthcare worker education and adherence to protocols are crucial for infection prevention in dialysis setting. However, the effectiveness of Nurse-led intervention specifically for improving infection prevention practices among nurses caring for pediatrics hemodialysis patients remain unclear.

What does this article add?

This study investigates the impact of nurse-led interventions on infection prevention practices in pediatric hemodialysis centers. We evaluate the effectiveness of the program in enhancing nurses' knowledge and adherence to infection control protocols, potentially creating a safer environment for young patients with chronic kidney disease.

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(1). the estimated probability of Stage 3–5 CKD in the population of the United Kingdom ranges from 5.4% to 8.5%(2). 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(3). 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(4). 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 (5)(6).

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 (7).

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(8).

Theoretical Framework

According to Benner's theory, nurses' professional knowledge has steadily increased and their nursing abilities have also improved over time as they get more work experience. The progression from a beginner to an expert model characterizes the process by which clinical nurses acquire and refine their professional knowledge and skills.(9)

Methodology:

Study Design: The study quasi-experimental design with a non - probability Convenience sample using a test-retest approach. Participants employed were 56 nurses in the Tikrit Teaching Hospital and Balad General Hospital in Salah Alden Governorate, tested in three periods: pretest, psottest1and posttest2. The study group and control group the participant is tested prior and post implementation the study. (The interventional program started from September 2023) until to (April 2024).

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 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.

Interventional Program

The program incorporated the following resources recommended by the Centers for Disease Control and Prevention (CDC): eight nursing roles for infection control, trichotomous checklists, and an observation checklist covering eight domains of hemodialysis procedures.

Instrument of the Study:

To evaluate the nurses practice toward reducing errors and infection prevention in hemodialysis. 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: Observational checklist for nurses practice about the care of children with chronic renal failure. This part consisted of 8 domains. This checklist was obtained from the CDC and was used with their permeation for roles to prevent errors among children to evaluate nursing staff's practice about caring for children with chronic renal failure.

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 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 (0.750).

Statistical Methods:

The researcher used the statistical package for social sciences (SPSS) version 26 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

Table (2) presents an analysis indicating that the predominant age group in the overall sample is between 25 and less than 30 years, making up 43% of the participants. In terms of gender distribution, females constitute the majority at 70.84%. Regarding educational levels, 37.5% of the participants are nursing preparatory school graduates. The majority of respondents have nursing experience in hospitals, representing 62.64%. In the context of the years of experience in the hemodialysis department, the majority had 62.49%, the highest percentage of experience falls within the range of 1 to less than 3 years. When considering participation in dialysis training courses, the majority indicated "not sharing," specifically 51%.

Classes	Groups	Study sample (48)	
		Frequency	present
Age (Years)	20-less than 25 years	19	39.6
	25-less than 30 years	21	43.8
	30-less than 35 years	4	8.3
	35 years _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	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 the in	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	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): Assessment Nurses' practice scores for the study group (Pretest, posttest1 and Posttest2).

Item	Pretest				Posttest1				Posttest2			
	MS	SD	RII	ASS.	MS	SD	RII	ASS.	MS	SD	RII	ASS.
Overall, for Nurses' practice (N=76)	1.8762	0.3373	0.6115	moderate	2.9828	0.0375	0.9945	high	2.9828	0.0375	0.9945	high

MS.: Mean of Scores (weighted mean); Sd: Standard Deviation, RII.: Relative Importance Index, Ass.: Assessment, Low: (1.0-1.66), Moderate (1.67-2.34), High (2.35- 3).

Table (2) Statistics of nurse's practice concerning caring children with chronic renal failure in hemodialysis department. Findings indicated that the nurses with unsatisfactory Practice (low to moderate level). While, statistical of nurses' Practice caring children with chronic renal failure were practice moderate at total mean score (1.8194).

Table (3): Descriptive Statistics for Nurses' practice levels for control group (pretest and posttest1 and posttest2):

Item	*Pretest*				*Posttest1*				*Posttest2*			
	MS	SD	RII	Ass.	MS	SD	RII	Ass.	MS	SD	RII	Ass.
Overall, for Nurses' level of practice (N=76)	1.9415	0.3206	0.6476	Moderate	2.1152	0.2470	0.7048	Moderate	2.1219	0.2406	0.7071	Moderate

MS.: Mean of Scores (weighted mean); Sd: Standard Deviation, RII.: Relative Importance Index, Ass.: Assessment, Low: (1.0-1.66), Moderate (1.67-2.33), High (2.34-3).

Table 3: Statistics of nurses' practice concerning caring for children with chronic renal failure in the hemodialysis department. Findings indicated that the nurses had unsatisfactory practice (low to moderate level). While the statistics of nurses' practice caring for children with chronic renal failure were moderate at the total mean score (1.9415) in the pretest, the nurses' practices Through the results of the posttest1and postets2, it was shown that the level of nurses' practices remained at a moderate level. MS. (2.1152) and MS. (2.21912). This indicates that the nurses are a group that is still at a moderate level.

Table (4): Relationship between Nurses' Practice and Socio-demographic Characteristics.

Practice								
		Sum of Squares	df	Mean Square	F	Sig.	T_value	Ass.
Age	Between Groups	5.676	3	1.892	.895	.461	3.182	N/S
	Within Groups	42.283	20	2.114				
	Total	47.958	23					
Gender	Between Groups	7.074	1	7.074	3.807	.064	12.71	N/S
	Within Groups	40.884	22	1.858				
	Total	47.958	23					
Level of Educational	Between Groups	16.099	2	8.050	5.306	.014	4.303	S
	Within Groups	31.859	21	1.517				
	Total	47.958	23					

Years of experience of nurses the hospital	**Between Groups**	**5.608**	**2**	**2.804**	**1.390**	**.271**	**4.303**	**N/S**
	Within Groups	**42.350**	**21**	**2.017**				
	Total	**47.958**	**23**					
Years of experience in the hemodialysis department	**Between Groups**	**3.014**	**3**	**1.005**	**.447**	**.722**	**3.182**	**N/S**
	Within Groups	**44.944**	**20**	**2.247**				
	Total	**47.958**	**23**					
Participation of nurses in the dialysis training course	**Between Groups**	**2.762**	**3**	**.921**	**.407**	**.749**	**3.182**	**N/S**
	Within Groups	**45.197**	**20**	**2.260**				
	Total	**47.958**	**23**					

N/S:no significant, df: degree of freedom, sig. p_value, T_value: table value

Table (4) According to the study, there is a correlation between nurses' practice and their socio-demographic characteristics at the educational level. Furthermore, there is no relationship between a nurse's practice and their other socio-demographic characteristics—age, gender, years of experience in the hospital, and years of experience in the hemodialysis department.

Discussion:

Hemodialysis session success depends on various factors. This factor includes patient ability to sustain therapy, timing of initiation of dialysis, and the quality of the nephrologist and nurse's role and intervention. Nurses' role is crucial in preserving vascular access, enhancing patient trust, and impowering patients through education (10). Many studies highlighted the importance of nurses' knowledge in enhancing patients' outcomes by providing accurate information; additionally, Speciale's training in solutions has been effective in improving patient's outcomes (11). Nurse-led interventions have successfully engaged nurses and patients in their care and led to improved patients' outcomes(12). Continued education and training are essential to ensuring optimal care and outcomes in hemodialysis. (13)

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 (2023)(14).in addition another previous study conducted by Fadhil (2018) (15). And inconsistent with Bakey (2012) (16).

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 Jassm (2020) (17). and in same line with other studies of Bakey (2012) his study the study showed that the majority of the study sample were within age group (26 – 30) years old (16). 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 (18). And contrasting with previous research Ahmed (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 (19).

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 group more than one third of the participants are graduates' Nursing Preparatory school of nursing.

These findings disagree with previous reports of Hadi (2021) (20). In other hand reports of conducting by Ahmed (2023) (14).

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 (2017) (21). And this result differing from other reports by Ahmed (2023) (14).

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 practice concerning caring children with chronic renal failure.

In the present study, most nurses in the study group had a Moderate level of practice regarding canulation and decannulation of arteriovenous fistulas, connection and disconnection of central venue catheters, caring for the children during and after hemodialysis, medication preparation and administration, and catheter site care for children with chronic renal failure.

The finding of the study related to nurses practice in the study group with all domains of caring for children with chronic renal failure was a fair level was (1.8762) (table2).

In same line with previous study Mikhael EM (2023) to investigate the effect of Pharmacist-led educational on nurse practice about enopraxin injection the study found that the nurses' practices were satisfactory and post the educational program the nurses' practices was improved (22)

In same line with previous study of Salman (2023) their study to evaluate nurses practice toward application of standard precaution during caring patients with chronic renal failure they found that the majority on nurses was fair level.(23)

In the same line to the study done by Jassab (2023) to investigate the effectiveness of interventional

programs on nurses practice, the study found that more than half of the nurses had poor knowledge (24).in same line with Ibrahim (2023) they found the nurses level in nurses' practices in child safety post catheterization was fair (25) .

In constant with another study conducted by fadhil (2018) to evaluate nurses practice during intravenous infusion the study found the nurses was not apply the proper nursing practice before, intra and post infusion (26).

In pointe the researcher, there are many factors that can be affect the nurses practice, including workload, lack of training, and the complexity of the state of children with chronic renal failure.

The findings of the current study had agreed with those of Mahmood (2020) in their study about caring for patients with vascular access care in Baghdad city. The study found that the majority of nurses had a poor level of knowledge and practice in concerning nursing management of vascular access for patients with chronic renal failure (27).

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

The results of the study, there is a correlation between nurses' expertise, with their social and demographic characteristics, in the educational level. Furthermore, there is no relation between nurses practice and their other socio-demographic characteristics, including age, gender, and years of experience in hospital and years of experiences in hemodialysis department, years of experience table (3).

This result strongly agrees with a study conducted by Ahmed in 2024, the study found that there is a significant relationship between nurses practice and their level of education(28).

This finding is supported by a previous study by Bakey (2012). The study found that there is no significant relationship between nurses practice and their age.(29)

On the other hand, another study conducted by Fanta (2023) found that there is no relation between demographic characteristics and nurses practice(30) .

This research has the potential to significantly impact nursing practice in pediatric hemodialysis centers. The finding demonstrates the effectiveness of nurse-led intervention in enhancing nurses' knowledge and adherence to infection prevention protocols. It could provide a valuable model for improving patient safety. By implementing a similar intervention program, nurses can be better equipped to prevent infection, a major concern in these settings. This could lead to reduced patient morbidity, improved clinical outcomes, and a and a decrease the health care-associated infection for vulnerable pediatric patients with chronic kidney disease

Conclusion:

According to the study's findings, most nurses practice had moderate level toward caring child with chronic renal failure.

Recommendation:

The study recommended that to expand the knowledge of nurses concerning caring the children with chronic renal failure, hospitals should implement particular training programs relevant to the discharge plan and teach how to implement caring children with chronic renal failure. There is a need to encourage nursing staff to participate in the training courses and conferences special of the discharge plan as well as lectures to update the information and develop the skills of nurses.

Conflict of interests
No conflict of interests was declared by the authors.

Funding source
The authors did not receive any source of fund.

Data sharing statement
Supplementary data can be shared with the corresponding author upon reasonable request.

Reference:

1. Hussein M, Ahmed S. Effectiveness of an educational program on patients' knowledge concerning care of vascular access of hemodialysis in Al-Muthana Teaching hospitals. *Iraqi National Journal of Nursing Specialties*. 2020;33(1):33–43. **DOI: https://doi.org/10.58897/injns.v33i1.399**
2. Mankih RA, Hussain AHM. The role of motivational interviewing in improving health state of patients undergoing hemodialysis. *Pakistan Journal of Medical & Health Sciences.* 2022;16(06):642. DOI:

https://doi.org/10.53350/pjmhs22166642

3. Bakey SJ. Hemodialysis Nurses' Practices toward Hand Hygiene Performance at Baghdad Teaching Hospitals. *Indian J Public Health Res Dev*. 2019;10(4). DOI: 10.5958/0976-5506.2019.00768.X
4. Hermis AH, Abed RI. Effectiveness of self-regulation fluid program on patients with hemodialysis self-efficacy for fluid adherence in Al-Diwaniyah Teaching Hospital. *Iraqi National Journal of Nursing Specialties.* 2021;34(2):74–88. DOI: https://doi.org/10.58897/injns.v34i2.577DOI: https://doi.org/10.58897/injns.v34i2.577
5. National Kidney Foundation. How Your Kidneys Work [Internet]. 2023 [cited 2023 Sep 19]. Available from: https://www.kidney.org/atoz/content/howkidneyswork
6. Daugirdas JT, Blake PG, Ing TS. Handbook of Dialysis [Internet]. Wolters Kluwer Health; 2012. (Lippincott Williams & Wilkins Handbook Series). Available from: https://books.google.iq/books?id=sYVjBgeMiLwC
7. Nissenson AR, Fine RN, Mehrotra R, Zaritsky J. Handbook of Dialysis Therapy [Internet]. Elsevier Health Sciences; 2022. Available from: https://books.google.iq/books?id=jNFvEAAAQBAJZahr
8. Camedda C, Bici G, Magi CE, Guzzon A, Longobucco Y. The Therapeutic Nurse–Patient Relationship in Hemodialysis: A Pilot Mixed-Method Study on the Perceived Quality of Nurses' Attitudes and Caring Behaviors. Nurs Rep. 2023;13(3):990–1003. **https://doi.org/10.3390/nursrep13030087**
9. Benner P. From novice to expert. *AJN The American Journal of Nursing*. 1982;82(3):402–7.
10. Ahmadpour B, Ghafourifard M, Ghahramanian A. Trust towards nurses who care for haemodialysis patients: a cross-sectional study. Scand J Caring Sci. 2020 Dec 12;34(4):1010–6.
11. Moisoglou I, Yfantis A, Tsiouma E, Galanis P. The work environment of haemodialysis nurses and its mediating role in burnout. J Ren Care. 2021 Jun 28;47(2):133–40.
12. Barnes T, Hancock K, Dainton M. TRAINING NURSES TO SUPPORT GREATER PATIENT ENGAGEMENT IN HAEMODIALYSIS. J Ren Care. 2013 Sep 13;39(S2):10–8.
13. Beyebach M, Neipp M del C, García-Moreno M, González-Sánchez I. Impact of nurses′ solution-focused communication on the fluid adherence of adult patients on haemodialysis. J Adv Nurs. 2018 Nov 19;74(11):2654–7.
14. Mohammed A, Baeez YK. Assessment of Nurses' Knowledge and Practices Regarding Nursing Management for Patients on Hemodialysis at Kirkuk General Hospital/Iraq. *Mosul Journal of Nursing*. 2023;11(1):48–58. DOI: 10.33899/MJN.2023.176945
15. Fadhil I, Hassan H. Evaluation of Nurses' Practices toward Safe Intravenous Chemotherapy Infusion in Baghdad City Hospitals. *Iraqi National Journal of Nursing Specialties*. 2018;31(2):43–56. DOI: https://doi.org/10.58897/injns.v31i2.306
16. Bakey S. Evaluation of Nurses' Practices throughout Hemodialysis Treatment for Patients in hemodialysis unit at Baghdad teaching hospitals. *Kufa Journal for Nursing Sciences*. 2012;2(2):22–34. DOI: https://doi.org/10.36321/kjns.vi20122.2985
17. Jassm A, Aziz A. Effectiveness of Health Educational Program on Nurses' Knowledge toward Children Pneumonia in Al-Amara City Hospitals. *Iraqi National Journal of Nursing Specialties*. 2020;33(1):44–52. DOI:

https://doi.org/10.58897/injns.v35i1.344
18. Ismael NH. Awareness of Nurse's Knowledge Regarding Hemodialysis Procedure and Complications in Dialysis Center of Sulaimani city. *Mosul Journal of Nursing*. 2023;11(1):104–12. DOI: 10.33899/MJN.2023.176963
19. Ahmed MMM, Hassan HE, Mohamed AAE, Saleh ASEM. Knowledge and practice of nurses toward preventive measures of elderly patients with viral hepatitis B and C in the dialysis unit. *NILES journal for Geriatric and Gerontology*. 2024;7(1):70–91. DOI:10.21608/NILES.2024.318075
20. Hadi QM, Alreda J. Assessment of Nurses' knowledge and Practices Concerning Hemodialysis Adequacy Guideline in Baghdad TeachingHospitals. *Kufa Journal for Nursing Sciences*. 2021;11(1):276–82. DOI: https://doi.org/10.36321/kjns.vi20211.472
21. Waleed S, Hattab K. Effectiveness of an educational program on nurses' knowledge about peritoneal dialysis at Pediatric teaching hospitals in Baghdad City. *Journal of Nursing and Health Science* (IOSR-JNHS). 2017;6(6):39–47.
22. Mikhael EM, Nassir KF, Alkhaqani AL, Jabbar ZR. Effectiveness of Pharmacist-Led Nurse Education on Enoxaparin Injection Technique in Baghdad Teaching Hospital, Iraq. *Al-Rafidain Journal of Medical Sciences* (ISSN 2789-3219). 2024 Mar 12;6(1):202–7. DOI: https://doi.org/10.54133/ajms.v6i1.622
23. Salman NT, Muttaleb WM. Evaluation of Nurses' Practices Toward the Application Standard Precaution Measures in Children Hemodialysis Unit. *Pakistan Heart Journal*. 2023;56(2):274–83.
24. Flayyih MJ, Mohammed WK. Effectiveness of intervention program on nurses' practice about cataract. *Rawal Medical Journal*. 2023;48(3):670. DOI: doi: 10.5455/rmj.20230601095842
25. Omran I k, Shawq A H. Evaluation of nurses Practice toward Children Safety Post Cardiac Catheterization Procedure. *Pakistan Heart Journal*. 2023;56(2):448–55.
26. Fadhil I, Hassan H. Evaluation of Nurses' Practices toward Safe Intravenous Chemotherapy Infusion in Baghdad City Hospitals. *Iraqi National Journal of Nursing* Specialties. 2018;31(2):43–56. DOI: https://doi.org/10.58897/injns.v31i2.306
27. Mahmood WA, Khudur KM. Effectiveness of an Educational Program on Nurses' Knowledge and Practices Concerning Nursing Management of patients' with Vascular Access in Dialysis Centers at Baghdad Teaching Hospitals. *Indian Journal of Forensic Medicine* & Toxicology. 2020;14(3). DOI: 10.37506/ijfmt.v14i3.10830
28. Ahmed MMM, Hassan HE, Mohamed AAE, Saleh ASEM. Knowledge and Practice of Nurses toward Preventive Measures of Elderly Patients with Viral Hepatitis B and C in the Dialysis Unit. NILES *journal for Geriatric and Gerontology*. 2024;7(1):70–91. DOI: 10.21608/NILES.2024.318075
29. Assi AL, Serwan Jafar Bakev, Kadhum HY. Evaluation of Nurses" practices toward the using of personal protective equipment's in haemodialysis unit at Baghdad teaching hospitals.
30. Fanta A, Legesse T, Legesse T. Nurses Knowledge and Associated Factors towards Hemodialysis Care at Governmental Dialysis Units in Addis Ababa, Ethiopia. 2023; https://doi.org/10.21203/rs.3.rs-2898567/v1