Effectiveness of an Educational Program on Hemodialysis Patients' knowledge about Uremic Pruritus

Marwan S. Alkhafaji[1], Ayad M. Al-Mayahi[2]

[1]Academic Nurse, BSN, MSc student, Thi-Qar Health Directorate, Thi-Qar, Iraq, Email: marwansawoodalkhafaji@gmail.com

[2]Assistant Professor, Adult Nursing Department, Faculty of Nursing, University of Baghdad, Email: ayadm@conursing.uobaghdad.edu.iq

Abstract

One of the most significant and effective procedure options that can help a patient with end-stage renal disease and maintain their quality of life is hemodialysis (HD). A lot of HD patients experience uremic pruritus (UP) due to elevated concentrations of toxic substances in the blood (urea, creatinine, and others). Patients' education is an essential part of health care since it promotes an ongoing, interactive process aimed at enhancing the patient's lifestyle and preventing or reducing the consequences tied to UP.

Objective of the Study: Evaluate the influence of educational program on hemodialysis patients' knowledge about uremic pruritus.

Method: A quantitative quasi experimental-research design was used in this study.

Setting: The present study was done in hemodialysis center at Al-Hussein Teaching Hospital/ Thi-Qar governorate in Iraq republic from 29th of December, 2022 to 29th of May.

Sample: A non-probability (purposively) sample of (60) hemodialysis patients was divided into two groups (study and control) with equal size.

Tools: which consists of three parts (1) sociodemographic characteristics (2) clinical characteristics, and (3) questionnaire to assessment of hemodialysis patient knowledge regarding to uremic pruritus (items & domains about uremic pruritus).

Results: At the pretest, the average knowledge scores in the study and control groups were closely similar. However, at the posttest, there was a statistically significant difference between the two groups because the average knowledge scores in the study group were significantly higher than in the control group.

Conclusion: This study concluded that carrying out educational sessions had a good impact on hemodialysis patients' knowledge of uremic pruritus (UP). According to the current results, the present study's hypothesis was accepted, according to which the patients who received uremic pruritus educational interventions had a good level of knowledge.

Recommendations: The study suggested generating an educational center for patients in hemodialysis units, equipped with sufficient educational materials, media, audiovisual aids, and booklets to teach all patients how to understand their medical conditions (uremic pruritus). When providing information to patients and family members, nurses have more options to facilitate the delivery of information to patients.

Key Words: Educational Program, Hemodialysis Patients, Uremic Pruritus, Knowledge.

Introduction:

The major form of therapy for people with end-stage renal illness is hemodialysis (HD). It cleanses the body of waste substances such urea, creatinine, and surplus fluids. While HD lessens illness symptoms and enhances patients' lifestyles, the disease and its effects still have an impact on their quality of life. These patients frequently struggle with lack of knowledge and therapy non-adherence, which can have an impact on many aspects of care [1]. Chronic kidney disease and end-stage renal disease are both associated with uremic pruritus, also known as CKD-aP (CKD-related pruritus). (ESRD). Between 60% to 80% of HD patients experience uremic pruritus during hemodialysis, making it one of the most painful and incapacitating symptoms. It negatively affects patients' physical, psychological, and social conditions, which has a severe negative influence on patients' quality of life and raises the morbidity and death rate among such patients [2]. The cornerstone of managing uremic pruritus (UP) in HD patients is health education. It can help patients manage their intricate treatment plans. Therefore, it appears that a lack of knowledge is the main cause of treatment regimen noncompliance, which may then result in an aggravation of the UP problems. By creating an educational center for

patients in the hospital, equipped with sufficient educational materials, media, audiovisual aids, and booklets for teaching all patients how to manage their medical conditions, nurses will have more options for communicating information in a way that is clear and simple to understand [3]. All patients in the hemodialysis ward should be subject to a particular and ongoing education program, which involves including patients in educational activities to broaden their knowledge [4]. Diverse ways have been used in educational campaigns to enhance patients' awareness about UP. These include dietary restrictions, the use of UP medicines, and lifestyle changes. Therefore, nurses play a crucial role in providing these patients with the educational interventions related to long-term health promotion strategies, taking into account functional limits, mental problems, and their educational requirements [5]. The caregivers who improve their expertise in hemodialysis procedures are seen as being highly vital. They also offer a short reading list for caretakers. Compared to other healthcare providers, nurses have greater face-to-face interaction time to emphasize the significance of compliance, which is a key factor in enhancing patient outcomes. For UP patients, nurses can undertake nursing management that helps patients better understand their renal disease state and develop self-care skills in order to enhance compliance and quality of life. The nurse's involvement is crucial in teaching and facilitating the patient's adaptation to a new treatment regimen [6]. Long-term hemodialysis patients will be cared for using the multidisciplinary techniques. Included should be the patient, the patient's family, the nurse and other dialysis staff, the renal dietician, the nephrologists, the social worker, and the psychologist [7].

Importance of the study:

For HD patients, uremic pruritus is a typical and upsetting symptom. It causes a number of issues, including sleep deprivation, sadness, a decrease in life quality, as well as a higher chance of mortality [8]. Patients on hemodialysis who experience uremic pruritus (UP) require a collaborative approach for managing the condition, with nurses playing a key role in managing these patients. It was discovered from the researcher's clinical observation at the hemodialysis unit that pruritus was the most frequent complaint of HD patients that affected their quality of life, sleep, and lifestyle. Regrettably, a significant portion of HD patients lacked understanding regarding how to treat uremic pruritus. Hemodialysis patients frequently have informational gaps and adherence problems, which can have a negative impact on many areas of therapy. It is believed that at least half of hemodialysis patients do not adhere to their whole treatment regimen [9]. Thereby, it is essential to conduct research in order to assess how uremic pruritus education programs improve hemodialysis patients' knowledge.

Objectives of this study:

- To assess the level of knowledge about uremic pruritus among hemodialysis patients.
- To assess how educational interventions improve and increase the knowledge of hemodialysis patients about uremic pruritus.
- To find out the relationship between effects of interventional health education about uremic pruritus with demographic and clinical characteristics (age, gender and educational level).

Research hypothesis:

- **Null Hypothesis:** The educational program does not improve hemodialysis patients' knowledge about ureamic pruritus.
- **Alternative Hypothesis:** The educational program will promote the knowledge of hemodialysis patients about uremic pruritus.

Materials and Method

Study Design:

A quantitative quasi-experimental design was used in this research.

Setting:

The present study was conducted in Al-Hussein Teaching Hospital (hemodialysis unit) at Thi-Qar governorate.

Subjects:

A non-probability purposive sample of (60) patients on maintenance hemodialysis was enrolled in this research. All samples were divided into two groups (study and control groups) that are equal in size by which 30 patients in each group chosen to accomplish the stated objectives of this research.

The enrolled patients in according to the following criteria:

Inclusion criteria

- Adult patients age 20 - 70 years.
- Patients with chronic renal failure and on maintenance hemodialysis.

- Patients got a weekly schedule of two to three HD sessions.
- Patients who are voluntary to participated in the study.

Exclusion criteria

- Patients who refused to participate in the study.
- Patients who struggle with their eyesight, psychological and hearing problems.
- Patients who are above 70 years old.
- Patients who had participated in any educational program about uremic pruritus.

Tools of the study: -

Data were collected using a one instrument, which accomplishes the study's objectives as following:

- **Instrument:** It was a three-part structured interview questionnaire, as follows:

Part one: Demographic data: This section was created by the researcher to gather baseline and individual information including gender, age, marital status, degree of education, and occupation.

Part two: Medical data: This section was developed by the investigator in order to gather clinical information on renal failure causes, family history of renal failure, length of hemodialysis session, number of sessions per week, incidence of uremic pruritus.

Part three: Patient knowledge assessment: This section of the instrument was created by the researcher to evaluate patients' knowledge about uremic pruritus, its causes, symptoms, lifestyles, medications and nutrition as a pre- and posttest assessment. Thirty questions divided on five domains have one valid response, thus the answers are corrected, wrong, or I don't know.

Scoring system: The knowledge test had a total score range of 0 — 30. Each correct response receives one point, while unknown or wrong responses receive zero.

Three levels were assigned to the total knowledge score:

- 0-10= poor level of knowledge
- 11-20= fair level of knowledge
- 21-30= good level of knowledge

Validity& Reliability:

The tools were evaluated for feasibility, clarity, relevance, comprehensiveness, understanding, applicability, and simplicity of implementation by a panel of ten academic professors and assistant professors from the college of nursing / university of Baghdad. Based on their recommendations, some modifications were made, while the Statistical Package for Social Science Program (SPSS) version 26 and Cronbach's alpha methodology were used to evaluate the study instrument's reliability.

Pilot Study:

Before beginning data collection, the chosen tools were tested on a group of 10 hemodialysis patients to make sure they were clear, applicable, and workable. The samples of pilot will be excluded from the research population.

Ethical considerations:

The University of Baghdad's nursing faculty provided administrative preparations like formal approval. Once the faculty sent an official letter and made the purpose and scope of the study clear, an official letter was also received from the hospital administrative authorities. After explaining the purpose and nature of the study to the patients, oral agreement was acquired. The patient was informed that declining to participate in the research would not have an impact on their care. The study was conducted with the utmost confidentiality, privacy, safety, and anonymity. The patient's right to withdraw from the study at any moment was reinforced by the researcher to them.

Data collection:

The researcher conducted interviews with each patient in both groups over the course of a six-month period, beginning in 29 December 2022 and ending in 29 may 2023. These interviews took place during the assessment, intervention, and evaluation stages.

Assessment phase: -

The researcher described the study's goals and methods during this step. Use one tool to evaluate the patients who fulfill the sampling criteria. For each patient (20 to 30) minutes were required to complete the pretest assessment (collect the demographic, clinical characteristics and hemodialysis patients' knowledge about uremic pruritus).

Implementation phase: -

Each patient was personally interviewed, and a written, colorful booklet including information about UP was delivered to each patient. At this phase, the information was delivered in the form of two three sessions, each lasting for (20 to 30) minutes as follow:

first session: Patients received information from the researcher on the kidney, its function, kidney failure, and dialysis.

Second session: Overview of basic information about what is uremic pruritus.

Third session: The researcher reviewed previously imparted knowledge before discussing how to intervene and manage the uremic pruritus.

Evaluation phase: -

Each patient in the study and control group had a posttest to assess the effect of educational interventions on the degree of patient knowledge related uremic pruritus.

Results:

Table 1

Distribution of the (60) Hemodialysis Patients According to their Demographical Characteristics (study and control groups):

Demographic Variables	Study Group (N=30)			Control group (N= 30)	
	Groups	F.*	%	F.	%
1. Gender	Male	17	56.7	19	63.3
	Female	13	43.3	11	36.7
2. Age	20-29	1	3.3	3	10.0
	30-39	6	20.0	4	13.3
	40-49	6	20.0	9	30.0
	50-59	12	40.0	6	20.0
	60 and above	5	16.7	8	26.7
	MS±SD = 48±12.37			MS±SD = 48±13.74	
3. Marital status	single	1	3.3	3	10.0
	married	24	80.0	25	83.3
	Widow	5	16.7	2	6.7
4. Educational level	illiterate	5	16.7	5	16.7
	read and write	9	30.0	3	10.0
	primary school	6	20.0	7	23.3
	Middle school	3	10.0	8	26.7
	preparatory school	2	6.7	3	10.0
	diploma	3	10.0	3	10.0
	bachelor	1	3.3	1	3.3
	Master's or Ph.D.	1	3.3	0	0.0
5. Occupation	officer	5	16.7	7	23.3
	retired	7	23.3	4	13.3
	Unemployed	10	33.3	13	43.3
	free business	1	3.3	3	10.0
	Housewife	7	23.3	2	6.7
	Student	0	0.0	1	3.3

Table (1) indicates that majority of study and control group are males with percentage (56.7%, 63.3%) respectively, with the age group (50-59), (40-49) respectively, with mean and standard deviation for the study and control group (48± 12.37, 48± 13.74) respectively. Regarding marital status, the vast majority of both groups (study and control) are married, which accounts for (80.0% and 83.3%) respectively. In relation to educational level, the majority of the study sample is read and write (30.0%), while the majority of the control group are middle school graduates (26.7%). Concerning the occupation, the most common of the study and control samples is unemployed, which accounted for (33.3% and 43.3%) respectively.

Table 2

Distribution of the (60) Hemodialysis Patients According to the Clinical Characteristics (study and control groups):

Clinical characteristics	Study Group (N=30)			Control group (N= 30)	
	Groups	F.*	%	F.	%
1. Family history with Renal Failure	Not Present	23	76.7	27	90.0
	Present	7	23.3	3	10.0
2. Causes of Renal Failure	Hypertension	15	50.0	14	46.7
	Diabetes	2	6.7	3	10.0
	HTN + DM	6	20.0	6	20.0
	kidney diseases	7	23.3	7	23.3
3. Number of hemodialysis sessions per week	Two sessions	9	30.0	13	43.3
	Three sessions	21	70.0	17	56.7
4. Duration of hemodialysis session	Three hours	5	16.7	6	20.0
	Four hours	25	83.3	24	80.0
5. When did the patient start hemodialysis	less than 1 year	11	36.7	11	36.7
	less than 2 years	6	20.0	6	20.0
	less than 3 years	5	16.7	5	16.7
	more than 3 years	8	26.7	8	26.7
6. Presence of previous uremic pruritus	Not Present	6	20.0	7	23.3
	Present	24	80.0	23	76.7

F= frequency, %= percent

Table (2) refers to that the vast majority of the study and control samples have no family history of renal failure, with percentages (76.7%, 90.0%) respectively. The most common of the study and control participants have renal failure because of hypertension, which accounted (50.0%, 46.7%) respectively. Regarding to the number of hemodialysis sessions per week, most of those have three sessions per week with (study = 70.0% and control =56.7%). In related to duration of each hemodialysis session the bulk of study and control samples have 4 hours in each session. Most of both samples have started the hemodialysis in less one year, which account for (36.7% in each group). Concerning the presence of uremic pruritus, most samples have

uremic pruritus in previous time with percentage (study =80.0%, control =76,7%).

Table 3

illustrates the mean total scores for the pre- and posttests on patients' knowledge about uremic pruritus.

Knowledge domains	Test period	Study Group (N=30)		Control Group (N=30)		Independent t Test statistics		
		M.	SD	M.	SD	t test value	df	P
1.Uremic nature and causes	Pre	3.06	1.11	2.90	1.06	.594	58	0.555 NS
	Post	6.86	.43	3.23	.85	20.68	58	0,000 HS
2.Bathing	Pre	1.30	0.74	1.43	0.77	.678	58	0.501 NS
	Post	4.76	.50	1.96	.71	17.47	58	0,000 HS
3.Daily habits &lifestyle	Pre	1.83	0.69	1.73	0.69	.557	58	0.580 NS
	Post	5.80	.55	2.13	.68	22.91	58	0,000 HS
4.Treatment	Pre	0.96	0.61	1.06	0.69	.592	58	0.556 NS
	Post	3.73	.63	1.43	.77	12.54	58	0,000 HS
5.Dietary pattern	Pre	2.33	0.75	2.20	0.80	.660	58	0.512 NS
	Post	7.26	1.04	3.06	.94	16,30	58	0,000 HS
Total knowledge regarding uremic pruritus	Pre	9.50	2.09	9.33	1.93	0.32	58	0.750 NS
	Post	28.43	2.37	11.83	2.13	28,48	58	0.000 HS

M.= mean, SD=standard deviation, df=degree of freedom, NS= Non-significant, HS= highly significant

In regards to patients' knowledge about UP during the pretest, it was demonstrated that there is no statistically significant difference between the average scores in the study and control groups (P > 0.005). As a result of the average scores in the study group being substantially higher (28.43 ± 2.37) than in the control group (11.83 ± 2.13), there was a statistically significant difference between the study and control groups in the posttest period at p value = 0.000.

Table 4

Association between Socio-Demographic and Clinical Characteristics with Level of Hemodialysis Patients' Knowledge about Uremic Pruritus for the study group:

Socio-demographic and clinical variables	Contingency Coefficients	P value	Sig.*
Gender	.187	0.297	NS
Marital status	.356	0.114	NS
Age groups	0.505	0.036	S
Educational level	0.472	0.283	NS
Occupation	0.215	0.834	NS
family history with CRF	0.218	0.222	NS
causes of renal failure	0.209	0.712	NS
Number of hemodialysis sessions	0.152	.398	NS
Duration of hemodialysis session	0.302	0.083	NS
when did the patient start hemodialysis	0.176	0.811	NS
Presence of previous uremic pruritus	0,243	0,432	NS

This table reveals that, with the exception of the age groups where there is a substantial relationship (p value < 0.05), there is no association between socio-demographic and clinical characteristics and the effectiveness of an educational program among hemodialysis patients' knowledge of uremic pruritus (p value > 0.05).

Discussion:

According to Table (1). Males made up the majority of both the study sample (n=17; 56.7%), as well as the control group (n=19; 63.3%). These results were almost identical to [9] who they stated that number of hemodialysis men are 1.7 million whiles number of women are 1.3 million when they collect the data from 195 country, this may be due prevalence of hypertension and diabetes nephropathy in male than female (researcher).

Concerning age group, the majority of the study sample (n=12;40.0%) is made up of people who are between the ages of 50 to 59, with a mean age and standard deviation 48±12.37, respectively, while the majority of the control sample (n=9;30.0%) is made up of people who are between the ages of 40 to 49, with a mean age and standard deviation 48±13.74, respectively. These outcomes agree with [10], who they reported that people over the age of 40 comprise the majority of hemodialysis patients.

The great majority of the study participants (n=24; 80.0%) and control samples (n=25; 83.3%) were married in terms of marital status. These results are in contrast to research findings from [11] that stated the majority (74%) of the samples was single. According to the researcher's opinion, religious customs and societal elements that have an impact on Iraqi culture are to blame for this proportion.

According to educational level, the majority of the study group are read and write (n=9;30.0%), In contrast, middle school graduates make up the majority

of the control group (n=8;26.7%). Because most families in our nation are below the poverty line, this is a usual outcome. (Researcher).

In terms of the occupation, it was found that most of the study subject (n=10;33.3%) and control sample (n=13;43.3%) were unemployed; this is consistent with findings of [12], who examined "socio-demographic data, clinical analysis, and projected burden of hemodialysis in Jordan" and found that the majority of the research groups were unemployed.

Concerning the family history of kidney failure, table (2) shows that a large percentage of hemodialysis patients in the study group (n=23; 76.7%) and control group (n=27; 90.0%) did not have a family history of the disease. This finding is consistent with and supports the assertion made by [13], that the bulk of hemodialysis patients with no family history of kidney failure.

In regards to the causes of kidney failure, hypertension was the primary factor in both the study group (n=15; 50.0%) and the control group (n=14; 46.7%) of hemodialysis patients. These results are in agreement with [14] who conducted the "Prevalence of chronic kidney disease-associated pruritus, and association with sleep quality among hemodialysis patients in Pakistan" which discovered that hypertension was the most common co-morbidity observed among hemodialysis patients with uremic pruritus.

The vast majority of the study group underwent hemodialysis three times a week (n=21;70.0%), lasting four hours each time (n=25;83.3%), also a large portion of the control group underwent hemodialysis three times a week (n=17;56.7%), lasting four hours each time (n=24;80.0%). This findings in a line with [15], who they stated that majority of HD patients require three sessions each week, lasting four hours each.

Relative to the history of hemodialysis, most of the participants in both groups had started receiving hemodialysis less than a year earlier, according to Table (2), with the same percentage (n = 11, 36.7%) in each group. Much of the hemodialysis patients, in turn, will either look for alternative treatments, such as a kidney transplant, or they may not attend hemodialysis sessions because of an economic factor, or they may become bored after a year of hemodialysis (from the researcher's perspective).

In relation to presence of uremic pruritus, large proportion of hemodialysis patients in both groups (study and control) have uremic pruritus in previous time, with percentages of (n=24;80.0%, n=23;76.7%), respectively. This finding was in agreement with [16], who reported that around (76,7%) of hemodialysis patients had uremic pruritus.

Before applying the educational program about uremic pruritus to the study group, as shown in Table (3), there was no statistically significant difference between the study and control groups at the pre-test assessment (P value = 0.750). In addition, we discovered nearly identical results (low average mean of knowledge) for both groups (study and control). The results of table (3) provide an excellent illustration of the educational program's effectiveness for hemodialysis patients' knowledge, by which after implementing the educational program, there were highly significant mean differences regarding uremic pruritus domains between the study and control groups at the post-test period, with a p value = 0.000, there is improvement in the knowledge level that become a good knowledge level (total knowledge = 28.43).

Current findings in agreement with [17] who reported that a hemodialysis patients had a poor knowledge at pretest period for study and control participants regarding uremic pruritus, while there is improvement in total knowledge of those participants after applying educational intervention for study participants.

The results of current research are in accordance with [18] They reported that the knowledge of patients at the hemodialysis unit about the relief of itching was poor for both groups (study and control) at pretest but improved (good knowledge) at posttest after applying an educational program for the study group.

Additionally, the findings of the present study are comparable to [19] the majority of the patients achieved a knowledge score that was less than "good" before the educational intervention, but their knowledge a rating improved greatly after the intervention, and all participants in the educational program had a good level of knowledge. There was a statistically significant difference in the improvement of the scores attained after the educational interventions, and all participants in the educational program had a good knowledge.

Also, the current study's outcomes are matched with findings of [20], who assess the effectiveness of the Self-regulation Fluid Program on patients with hemodialysis and self-efficacy for fluid compliance, they discovered that educational interventions in hemodialysis patients increase their knowledge and adherence level as there are high statistically significant improvements were noted in the mean and

standard deviation of percent knowledge score as compared to the pre-intervention period.

These results are almost similarly with [21] who assessed the impact of an interventional program on hemodialysis patients' knowledge regarding the dietary habits and adherence to medicine, they stated there is a high statistically significant differences among patients' knowledge scores at the pre- and post-test levels of assessment, and that the mean level of general knowledge about this subject has improved.

Table (4) demonstrated that, with the exception of the age group (p value =0.036), there is no statistically significant link between the demographic and clinical characteristics and the degree of hemodialysis patients' knowledge about uremic pruritus for the study participants. This result corroborated and agreed with [22], that researched "Hemodialysis patients' information and associated characteristics" and found a statistically significant relationship between degree of information and age. This might be because elderly individuals are more devoted to life and desire to live longer (researcher's point of view). Also, these results in accordance with [23] they assess the influence of the educational program on self-care of patients who receiving hemodialysis, and they stated there is a significant relationship between age group and knowledge level of hemodialysis patients about self-care.

Conclusions:

According to the results of this research, the patients' knowledge of urticaria increased significantly through the educational program and the booklet. Hence, since the educational intervention has a positive effect on the knowledge of the research group, therefore, we accept the alternative hypothesis and reject the null hypothesis.

Recommendations:

- HD patients should be given a written, illustrated handbook regarding uremic pruritus information.
- To generalize the findings, repeat the study with a larger sample in multiple settings.
- Periodic and ongoing assessment of hemodialysis patients' knowledge about uremic pruritus is necessary to enhance their health condition and reduce the likelihood of UP issues.

Financial Disclosure: There is no financial disclosure.
Conflict of Interest: None to declare.

References:

1. Fadlalmola HA, Elkareem EM. Impact of an educational program on knowledge and quality of life among hemodialysis patients in Khartoum state. International Journal of Africa Nursing Sciences. 2020 Jan 1; 12:100205.
2. Cheng AY, Wong LS. Uremic pruritus: from diagnosis to treatment. Diagnostics. 2022 Apr 28;12(5):1108.
3. Al-Ashour IA, Mohammed WK. Effectiveness of A Nutritional Instructional Program on Health-Related Outcomes for Hemodialysis Patients. Indian Journal of Forensic Medicine & Toxicology. 2021 May 17;15(3):3273-82.
4. 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 Sep 27;33(1):33-43.
5. Rodgers BL, Jacelon CS, Knafl KA. Concept analysis and the advance of nursing knowledge: state of the science. Journal of Nursing Scholarship. 2018 Jul;50(4):451-9.
6. Naser AM, Mohammed WK. Effectiveness of Instructional Health Educational Vascular Access on Hemodialysis Patients' Knowledge at Al-Hussein Teaching Hospital in AL-Nasiriyah City. Iraqi National Journal of Nursing Specialties. 2016;29(1).
7. 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 Jul 30;14(3):2604-8.
8. Goel V, Sil A, Das A. Cutaneous manifestations of chronic kidney disease, dialysis and post-renal transplant: A review. Indian Journal of Dermatology. 2021 Jan;66(1):3.
9. Bikbov B, Perico N, Remuzzi G, GBD Genitourinary Diseases Expert Group. Disparities in chronic kidney disease prevalence among males and females in 195 countries: analysis of the global burden of disease 2016 study. Nephron. 2018; 139:313-8.
10. Shinjar FJ, Bakey SJ, Khudur KM. Effectiveness of an Education Program on Hemodialysis Patients, Knowledge towards Dietary Regimen at Al-Hussein Teaching Hospital in Al-Nasiriyha City. Indian Journal of Public Health Research & Development. 2018 Oct 1;9(10).

11. Kadhum I, Mohammed W. Nutritional status of adult hemodialysis patients in Al-Najaf Al-Ashraf Governorate. Iraqi National Journal of Nursing Specialties. 2012;1(25):64-78.
12. Shdaifat EA, Manaf MR. Haemodialysis in Jordan: Socio-demographic data, clinical analysis and projecting burden. Middle East J Sci Res. 2013; 14:624-32.
13. Lunyera J, Mohottige D, Von Isenburg M, Jeuland M, Patel UD, Stanifer JW. CKD of uncertain etiology: a systematic review. Clinical journal of the American Society of Nephrology. 2016 Mar 7;11(3):379-85.
14. Rehman IU, Munib S, Ramadas A, Khan TM. Prevalence of chronic kidney disease-associated pruritus, and association with sleep quality among hemodialysis patients in Pakistan. PloS one. 2018 Nov 29;13(11): e0207758.
15. Gerogianni S, Babatsikou F, Gerogianni G, Grapsa E, Vasilopoulos G, Zyga S, Koutis C. 'Concerns of patients on dialysis: A Research Study'. Health Science Journal. 2014 Oct 1;8(4):423.
16. Al-Saedi AJ, Ghassan B, Al-Alawchi S. Uremic Pruritus in Haemodialysis Patients; Prevalence, Severity and Possible Associations. Iraqi Postgraduate Medical Journal. 2015 Dec 28;14(4).
17. Mohamed N, Sherif WI, El-Aziz A, Badran HM. Effect of uremic pruritus educational intervention on knowledge level for hemodialysis patients. Mansoura Nursing Journal. 2020 Jan 1;7(1):93-101.
18. Aliwy NH, Mohammed WK. Effectiveness of an Education Program on Hemodialysis Patient's toward Alleviate of Itching at Al-Hussein Teaching Hospital in Al-Nasiriyah City. Indian Journal of Public Health Research & Development. 2018 Oct 1;9(10).
19. Yousif KI, Abu-Aisha H, Abboud OI. The effect of an educational program for vascular access care on nurses' knowledge at dialysis centers in Khartoum State, Sudan. Saudi Journal of Kidney Diseases and Transplantation. 2017 Sep 1;28(5):1027-33.
20. 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.
21. Shawwat MA, Atiyah HH. Nutritional Behavior and Medication Adherence among Patients Undergoing Hemodialysis. Pakistan Journal of Medical & Health Sciences. 2022 Apr 28;16(03):899-.
22. Polikandrioti M, Koutelekos I, Vasilopoulos G, Babatsikou F, Gerogianni G, Zyga S, Panoutsopoulos G. Hemodialysis patients' information and associated characteristics. Materia socio-medica. 2017 Sep;29(3):182.
23. Khaleel M, Hassan H. Effectiveness of an Instructional Program on Knowledge of Patients with Renal Failure Undergoing Hemodialysis Concerning Self-Care in Baghdad Teaching Hospital. Indian Journal of Forensic Medicine & Toxicology. 2019 Oct 1;13(4).