

# EFFECT OF NURSING INTERVENTION ON UREMIC PRURITUS OF ELDERLY PATIENTS UNDERGOING HEMODIALYSIS

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## Abstract

**Background:** Uremic pruritus is a major public health problem and is a common and troublesome complication experienced by chronic kidney disease patients undergoing hemodialysis. Further, the oldest patients are the fastest growing subgroup of the dialysis population in developed countries. Older hemodialysis patients with uremic pruritus are suffering from increased morbidity and mortality and decreased quality of life.

**The aim** of this study was to evaluate the effect of nursing intervention on uremic pruritus of elderly patients undergoing hemodialysis.

**Research design:** A quasi-experimental pretest-and-posttest design was utilized.

**Setting:** The study was conducted at the hemodialysis unit at the internal medicine department of Zagazig University Hospital and the hemodialysis unit at Al Ahrar hospital affiliated to the Ministry of Health.

**Subject:** This study included 70 elderly patients.

**Tools:** Two tools were used. Tool I: A Structured Interview Questionnaire which consisted of part 1; demographic characteristics and part 2; health history and clinical data of elderly patients. Tool II: The 5-D itch scale.

**Results:** There is a highly statistically significant difference in the total mean score of itching among studied elderly patients undergoing hemodialysis pre-post the intervention ( $P=0.000$ ).

**Conclusion:** Uremic pruritus among studied elderly patients undergoing hemodialysis had greatly improved at post intervention phase.

**Recommendation:** It is recommended to replicate this study using a randomized clinical trial design in order to confirm the findings and to provide a higher level of evidence of its findings. Hemodialysis units must involve nursing intervention for improving uremic pruritus of hemodialysis patients.

**Keywords:** Nursing intervention, Uremic pruritus, Hemodialysis, Elderly

## INTRODUCTION

The aging of the worldwide population is now widely recognized as an issue that impacts skin. Skin aging, resulting in cumulative changes in skin structure, function, and appearance, is a complex process affected by both intrinsic and extrinsic factors (**Zhang & Duan, 2018**). One of the main features of the Egyptian population over the last few decades is the gradual increase in the number of older people. This is expected to continue in the next decades. The percentage of older people was 6.27% in 2006, rising to 6.9% in 2015 and about 9.2% in 2021. By 2050, it is expected to be 20.8% so the number of old people is expected to be 23.7 million (**Aboeldahab et al., 2021**).

Chronic kidney disease (CKD) is defined as a persistent impairment of kidney function, in other words, abnormally elevated serum creatinine for more than 3 months or calculated glomerular filtration rate (GFR) less than 60 ml per minute / 1.73m<sup>2</sup>. It often involves a progressive loss of kidney function necessitating renal replacement therapy (dialysis or transplantation). When a patient needs renal replacement therapy, the condition is called end-stage renal disease (ESRD) (**Bindroo et al., 2022**). Hemodialysis (HD) is the commonest form of RRT in the world, accounting for approximately 69% of all RRT and 89% of all dialysis (**Pecoits-Filho et al., 2020**).

Complications of hemodialysis are common such as nausea, vomiting, loss of appetite, fatigue, sleep disturbance, oliguria, muscle twitches and cramps, swelling of feet, shortness of breath due to pulmonary edema from fluid overload, hypertension, skin pigmentation and scratch marks from uremic pruritus (**Vaidya & Aeddula, 2021**).

Uremic pruritus is defined as itching directly related to kidney disease. Pruritus is a distressing comorbidity found commonly in patients with end-stage renal disease, and affects about one-third of dialysis patients (**Puneet et al., 2021**). Despite the clear associations with poorer health outcomes and reduced HRQoL, UP remains under-appreciated, under-reported and under-diagnosed. Pruritus has a major clinical impact, being associated strongly with poor quality of life, impaired sleep, depression and increased mortality (**Ahdoot et al., 2022**).

Uremic pruritus is one of the main skin complaints and one of the most common skin problems resulting in struggling to sleep at night. It is defined as an irritating skin sensation that can affect the quality of life (**Song et al., 2018**). Pruritus in elderly has many causes; pruritus is believed to be caused by a multifactor. According to previous studies, pruritus can be caused by anemia, uremia, disorders of the balance of phosphorus, calcium, and magnesium ions, inadequate dialysis, the tools used during HD and sensitivity to dialysate (**Panma et al., 2021**).

The clinical manifestations of uremic pruritus are heterogeneous with variable intensity and unpredictable timing around dialysis. The pattern of distribution is also inconsistent, but up to 50% of patients with UP experience generalized itches (**Kim & Pollock, 2021**).

The management of pruritus in the elderly poses a particular challenge. Encouragingly, some of the “anti-itch” pharmacological and nonpharmacological therapeutic approaches have shown promising effects in patients with uremic disease. Most of these promising strategies focus on the consequence rather than the cause of uremic pruritus and aim to target the nociceptive phase of the disease (**Martin et al., 2020**). Elderly patient with uremic pruritus should undergo careful history, full general and dermatologic examination. Further diagnostic tests, including skin biopsy, might be helpful in the diagnosis of unclear dermatological cases (**Aboeldahab et al., 2021**).

Topical therapy is a treatment of first choice in numerous dermatological conditions. To achieve therapeutic effect, an appropriate amount of product and high frequency of application are essential (**Reszke et al., 2021**). Baby oil is an excellent product formulated for baby’s sensitive skin. Baby oil is nothing but perfumed mineral oil, which has a long and rich history, with many changes over the years. Baby oil is not just for babies, it is actually very useful to all. The composition of regular baby oil includes mineral oil (this is liquid paraffin obtained from petroleum which is actually fine for the skin), aloe vera extract (this is a concentrated form of aloe Vera gel) (**Singh & Vinayadev, 2021**).

Topical application of baby oil is one of the options for reducing the impact of pruritus. Natural topical therapies and chemicals generally aim to hydrate by providing moisture to the skin of the patients with renal failure, who tend to dry out. Topical therapy is an invasive action and it is a simple therapy that can be applied independently.

Topical therapy using baby oil can be an option because it is effective, efficient and easily accessible by all groups (Sinawang et al., 2019). Therefore, raising awareness of uremic pruritus is crucial for both patients and health care providers. Nurses as health care providers should also be careful about making an accurate diagnosis in CKD patients with chronic pruritus. At the same time, understanding its pathophysiology of uremic pruritus to develop proper treatment is essential to improve patients' quality of life and medical outcomes (Cheng & Wong, 2022).

**Aim of the current study was to** evaluate the effect of nursing intervention on uremic pruritus of elderly patients undergoing hemodialysis.

**This aim was fulfilled through the following objectives:**

- 1- Assess uremic pruritus in elderly patients undergoing hemodialysis pre and post the nursing intervention.
- 2- Develop and implement nursing intervention to improve uremic pruritus in elderly patients undergoing hemodialysis.
- 3- Evaluate the effect of nursing intervention on uremic pruritus in elderly patients undergoing hemodialysis.

**Research Hypothesis:** After implementation of nursing intervention, uremic pruritus in elderly patients undergoing hemodialysis will be improved.

## SUBJECTS & METHOD:

### Study Design and Ethical Considerations

A quasi-experimental pre-test and post-test design was utilized to conduct the current study from the first of February 2021 to the end of August 2021 at the hemodialysis unit at the internal medicine department of Zagazig University Hospital and the hemodialysis unit at Al Ahrar hospital affiliated to the Ministry of Health, Sharkia governorate, Egypt. The study was approved by the Research Ethics Committee (REC) and the Postgraduate Committee of the Faculty of Nursing at Zagazig University, Egypt. Verbal consent was obtained from the participants after a description of the purpose of the study.

### Sample

A purposive sample composed of 70 elderly patients from the above mentioned setting who fulfilled the following inclusion criteria: 60 years and older, able to communicate, willing to participate in the study and patients who had an itching in a regular pattern during a period of 3 months. Elderly patients with underlying skin diseases and psychological disorders or any other secondary causes of pruritus were excluded.

**Sample size calculation:** Based on data from literature (Karadag et al., 2014), considering level of significance of 5%, and power of study of 80%, the sample size can be calculated using the following formula:

$$n = [(Z\alpha/2 + Z\beta)^2 \times \{2(SD)^2\}] / (\text{mean difference between the two groups})^2$$

Where

SD = standard deviation

Z $\alpha/2$ : This depends on level of significance, for 5% this is 1.96

Z $\beta$ : This depends on power, for 80% this is 0.84

Therefore,

$$n = [(1.96 + 0.84)^2 \times \{2(15.75)^2\}] / (7.5)^2 = 69.1$$

Based on the above formula, the sample size required per group is 70.

## Tools for data collection:

### Tool I: Structured interview questionnaire

It was developed by the researchers based on the literature review to collect the necessary data for the study. It consists of two parts: **Part 1:** demographic characteristics of the elderly which contains 9 questions (age, sex, level of education, marital status, and place of residence, occupation before retirement, work nature, income and living condition). **Part 2:** Health history and clinical data of elderly patients which contains questions such as (presence of other chronic diseases, type of chronic diseases and duration of chronic kidney diseases). In addition to that data about dialysis such as (date of beginning dialysis, number of hemodialysis sessions per week, causes of renal failure & type of medications with hemodialysis sessions).

### Tool II: The 5-D itch scale:

This scale was developed by **Elman et al. (2010)**. It is originally designed to assess the level of itching. This instrument has been validated and translated into Arabic language by **Khan, et al. (2013)**. It consists of five sections that measure duration, degree, direction, disability and distribution of itching. 5-D itch scale scores range from 5 (no pruritus) to 25 (most severe pruritus). Of these five domains, three were single-item domains (duration, degree and direction) with values ranging from 1 to 5. The disability domain had four sub items and its score is measured by taking the highest score of each of the four items. The final section was the distribution of pruritus on body parts. Body parts from 0 to 2 equals score 1, body parts from 3 to 5 equals score 2, sum of body parts from 6 to 10 equals score 3, sum from 11 to 13 body parts equals score 4 and sum from 14 to 16 body parts equals score 5.

### Pilot study

Before performing the main study, a pilot study was carried out on 7 elderly from the study setting, constituting about 10 percent of the sample calculated for main study. The purpose of pilot was to test the questions for any ambiguity, and to assess the practicability and feasibility of using the structured interview questionnaire sheet for the elderly. It also helped the researcher to determine the time needed for filling out the forms (30 to 45 minutes). The tools were finalized after doing necessary modifications according to the pilot study results. The pilot subjects were not included later in the main study sample.

### Fieldwork

The fieldwork included the phases of assessment, planning, implementation and evaluation of baby oil as a nursing intervention.

□ **Assessment phase:** This phase involved the pre-intervention data collection for baseline assessment. The researcher introduced herself and explained the purpose of the study briefly to the studied elderly and oral consent for participation was obtained. The data were preliminary analyzed to provide the basis for building-up the baby oil as a nursing intervention according to identified needs.

□ **Planning phase:** Based on the results obtained from the data analysis of the assessment phase, and in view of the pertinent literature about cognitive behavioral therapy, the researcher developed the baby oil as a nursing intervention and sessions contents according to the elderly needs and the study objectives. Identified needs, requirements and deficiencies were translated into aim and objectives of the baby oil as a nursing intervention and set in the form of a booklet. **The nursing intervention consisted of eight sessions:**

- **Session 1: (Time: 30:45 minutes)**

The main objective of this session was to improve elderly's knowledge about chronic kidney disease (CKD), causes of CKD, clinical picture of CKD, complications and prevention of CKD.

- **Session 2: (Time: 30:45 minutes)**

The main objective of this session was to improve elderly's knowledge about hemodialysis (HD) process including (definition, mechanism, advantages, disadvantages and complications of HD).

- **Session 3: (Time: 30:45 minutes)**

The main objective of this session was to improve elderly's knowledge about uremic pruritus (UP) including (causes, effect of Up on elderly on HD, complication and treatment of UP).

- **Session 4: (Time: 30:45 minutes)**

The main objective of this session was to help the elderly practice using 3-5 ml of baby oil on the itchy skin for 15 min three times a week using guidelines and following steps of nursing intervention to get rid of negative effect of UP on quality of life.

- **Session 5: (Time: 30:45 minutes)**

The main objective of this session was to help the elderly identify some exercises suitable for elderly people.

- **Session 6: (Time: 30:45 minutes)**

The main objective of this session was to help the elderly patients on HD gain knowledge about proper diet and healthy meals.

- **Session 7: (Time: 30:45 minutes)**

The main objective of this session was to help the elderly gain knowledge about multiple examples of non-pharmacological therapy.

- **Session 8: (Time: 30:45 minutes)**

The main objective of this session was to help the elderly identify some guidelines and steps that helps elderly to control uremic pruritus.

### ***Implementation phase***

The nursing intervention was implemented for the studied elderly. They acquired pertinent basic knowledge about hemodialysis, proper diet, exercise techniques and cognitive behavioral techniques. The intervention was offered to the studied elderly in the form of eight sessions for small groups to give more chance for discussions, interactions, and practical training. The total sample was divided into small groups (7 to 9 elderly in each group). All groups received the same content using the same teaching methods, media, discussions and the same booklet. Motivation and reinforcement techniques as praise and recognition during the session were used to enhance active participation and foster learning. The sessions were aided by using pictures, posters, as well as the booklet.

### ***Evaluation phase***

The evaluation of the effectiveness of the nursing intervention was done after its implementation. A post-test was carried out after two months of completion of the intervention. This was done using the same data collection tools of the pre-test.

### **Statistical Analysis**

Data entry and statistical analysis were done using SPSS 23.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations and medians for quantitative variables. Quantitative continuous data were compared using the non-parametric Mann-Whitney or Kruskal-Wallis tests and paired t test. Qualitative categorical variables were compared using chi-square test. Whenever the expected values in one or more of the cells in a 2x2 tables was less than 5, Fisher exact test was used instead. Spearman rank correlation was used for assessment of the inter-relationships among quantitative variables and ranked ones. Statistical significance was considered at p-value <0.05.

## RESULTS

**Table 1** shows that the mean age of the studied elderly was  $67.5 \pm 4.92$  years, 58.6 % were male, 58.6% were unmarried and 41.4% were married and lived with husband/wife, 70% belonged to rural areas, worked as farmers and handicraft, 71.5% had no current work. **Table 1** also indicates that, 40% of the studied elderly were illiterate, 31.4 % read and write, 21.4 % had intermediate educational level and 7.2% had high education. Regarding monthly income, 52.9% of the studied elderly had insufficient monthly income, 35.7% had sufficient monthly income and 11.4% had enough income and save.

**Table 2** reveals that, 92.9 % of the studied elderly patients had chronic diseases other than renal failure. 57.1% had cardiovascular diseases, 44.3% had DM and Joint & bone diseases, 38.6 % had hypertension and the mean of the total number of chronic diseases was  $1.9 \pm 0.8$ .

**Table 3** demonstrates that, 60.0% of the studied elderly were diagnosed with chronic kidney diseases from 2-8 years, 41.4% started hemodialysis since < 5 years and 34.3% started hemodialysis from 5-10 years. Regarding causes of renal failure according physician diagnosis, 42.9% and 32.9% had renal failure as a result of HTN and DM respectively. Total studied elderly attended three sessions a week, 87.1% take vitamins after hemodialysis session.

**Table 4a** shows a highly statistically significant improvement in the level of itching of the studied elderly patients at the post program phase, regarding all items of itching including, duration of itching, degree of itching and direction of itching.

**Table 4b** shows highly statistically significant improvements in the disability due to itching of the studied elderly patients at the post program phase, regarding all items of disability due to itching including, sleep and leisure-social domains.

**Table 4c** shows highly statistically significant improvement in the disability due to itching of the studied elderly patients at the post program phase, regarding housework-errands domain and a statistically significant improvement in the work-school domain.

**Table 4d** shows highly statistically significant improvements in the body parts by region (0-2 region, 6-10 region and 11-13 region) and statistically significant improvements in the body parts by region (3-5 region and 14-16 region).

**Table 5** illustrates highly statistically significant improvements in the total level of itching among elderly patients pre –post the intervention regarding all levels of itching (mild, moderate and severe).

**Figure 1** reveals a highly statistically significant difference in the total mean score of itching among studied elderly patients pre-post the intervention.

**Table 6** illustrates that there was a statistically significant relation between itching mean difference of the studied elderly patients and their medical history regarding duration of chronic kidney diseases diagnosis and onset of hemodialysis ( $p < 0.05$ ).

**Table 7** clarifies that the independent positive predictors for itching score were residence, educational level and duration of chronic kidney disease diagnosis. On the other hand, the onset of hemodialysis was an independent negative predictor. With no statistically significant predictor for itching score, the model explains 14% of the variation in itching score.

Table 1: Demographic characteristics of the studied elderly patients (N=70)

Demographic characteristics	(n=70)	
	Frequency	Percent

<b>Age group: /year</b>		
60-	51	72.9
70-	19	27.1
<b>Mean ± SD</b>	<b>67.5 ± 4.92</b>	
<b>(range)</b>	<b>(60 – 80)</b>	
<b>Gender:</b>		
Male	41	58.6
Female	29	41.4
<b>Educational level:</b>		
Illiterate	28	40
Read and write	22	31.4
Intermediate	15	21.4
High education	5	7.2
<b>Residence:</b>		
Rural	49	70.0
Urban	21	30.0
<b>Marital status:</b>		
Married	29	41.4
Un married [single /Widower/ divorced]	41	58.6
<b>Occupation before retiree:</b>		
Employee	13	18.6
Farmer	20	28.6
Handicraft	20	28.6
Housewife	17	24.2
<b>Current occupation:</b>		
Work	20	28.5
Not work	50	71.5
<b>Living with whom:</b>		
With husband / wife	29	41.4
With one of sons	17	24.3
Alone	13	18.6
With family	11	15.7

<b>Monthly income</b>		
Insufficient	37	52.9
Sufficient	25	35.7
Sufficient & Saving	8	11.4

Table (2): Medical history of the studied elderly patients (N=70)

<b>Medical history</b>	<b>(n=70)</b>	
	<b>Frequency</b>	<b>Percent</b>
<b>Have chronic diseases other than renal failure:</b>		
Yes	65	92.9
No	5	7.1
<b>Types of chronic diseases:@</b>		
Cardiovascular	40	57.1
DM	31	44.3
HTN	27	38.6
GIT	2	2.8
Join & bone diseases	31	44.3
Respiratory diseases	1	1.4
Urinary incontinence	1	1.4
<b>Total no. of chronic diseases:</b>		
< 2	7	10.0
≥ 2	63	90.0
<b>Mean ± SD</b>	<b>1.9 ± 0.8</b>	
<b>(range)</b>	<b>(0– 7)</b>	

@ Not mutually exclusive

Table (3): Renal failure and hemodialysis history of the studied elderly patients (N=70)

<b>Renal failure and hemodialysis</b>	<b>(n=70)</b>	
	<b>Frequency</b>	<b>Percent</b>
<b>Duration of chronic kidney diseases diagnosis</b>		
2-8 years	42	60.0

9 -17 years	22	31.4
Not remember	6	8.6
<b>Onset of hemodialysis:</b>		
≤ one year	17	24.3
< 5 years	29	41.4
5-10 years	24	34.3
<b>Causes of renal failure according physician diagnosis:</b>		
HTN	30	42.9
DM	23	32.9
Drugs	11	15.6
Don't know	6	8.6
<b>Hemodialysis frequency weekly:</b>		
Three sessions	70	100.0
<b>Drugs during session@:</b>		
Vitamins	61	87.1
Constipation	23	32.9
Stomach	35	50.0
Antibiotics	18	25.7
Skin drugs	15	21.4
Analgesics	44	62.9

@ Not mutually exclusive

Table (4a): The level of itching [duration, degree, direction] among studied elderly patients pre –post the intervention

Items		Pre (n=70)		Post (n=70)		X <sup>2</sup>	(p-value)
		No	%	No	%		
<b>[Duration]</b> <b>How many hours a day have you been itching</b>	Less than 6 hrs.	10	14.3	17	24.3	24.06	<b>.000**</b>
	6-12 hrs.	15	21.4	21	30.0		
	12-18 hrs.	17	24.3	21	30.0		
	18-23 hrs.	5	7.1	6	8.6		

	All day	23	32.9	5	7.1		
<b>[Degree]</b> <b>Rate the intensity of your itching over the past 2 weeks</b>	Not present	0	0.0	5	7.2	41.0	<b>.000**</b>
	Mild	14	20.0	22	31.4		
	Moderate	22	31.4	29	41.4		
	Severe	29	41.4	14	20.0		
	Intolerable	5	7.2	0	0.0		
<b>[Direction]</b> <b>Itching gotten better or worse compared to the previous month</b>	Completely resolved	0	0.0	4	5.7	42.0	<b>.000**</b>
	Much better but still present	12	17.1	22	31.4		
	Little bit better but still present	10	14.3	19	26.4		
	Unchanged	38	54.3	9	12.9		
	Getting worse	10	14.3	6	8.6		

\*: Significant

\*\* : Highly significant

Table (4b): The level of disability due to itching among studied elderly patients' pre –post the intervention

Items		Pre (n=70)		Post (n=70)		X <sup>2</sup>	(p-value)
		No	%	No	%		
<b>Sleep</b>	• Never affects sleep	7	10.0	19	27.1	47.0	<b>.000**</b>
	• Occasionally delays falling a sleep	6	8.6	17	24.3		
	• Frequently delays falling a sleep	19	27.1	21	30.0		
	• delays falling asleep and occasionally wakes me up at night	19	27.1	9	12.9		
	• delays falling asleep and frequently wakes me up at night	19	27.1	4	5.7		
<b>leisure-social</b>	• Never affects this activity	4	5.7	15	21.4	41.02	<b>.000**</b>

	● Rarely affects this activity	10	14.3	13	18.6		
	● Occasionally affects this activity	17	24.3	21	30.0		
	● Frequently affects this activity	22	31.4	13	18.6		
	● Always affects this activity	17	24.3	8	11.4		

\*: Significant

\*\*: Highly significant

Table (4c): The level of disability due to itching among studied elderly patients' pre –post the intervention

Items		Pre (n=70)		Post (n=70)		X <sup>2</sup>	(p-value)
		No	%	No	%		
<b>Housework-errands</b>	● Never affects this activity	2	2.9	8	11.4	38.02	<b>.000**</b>
	● Rarely affects this activity	8	11.4	18	25.7		
	● Occasionally affects this activity	20	28.6	27	38.6		
	● Frequently affects this activity	36	51.4	13	18.6		
	● Always affects this activity	4	5.7	4	5.7		
<b>Work-school</b>	● Not relevant	50	71.5	50	71.5	24.11	<b>.03*</b>
	● Never affects this activity	3	4.3	7	10.0		
	● Rarely affects this activity	2	2.9	4	5.7		
	● Occasionally affects this activity	5	7.1	9	12.8		
	● Frequently affects this activity	5	7.1	9	12.8		
	● Always affects this activity	10	14.2	0	0.0		

		0	0.0	0	0.0		
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\*: Significant

\*\*: Highly significant

Table (4d): Distribution of itching in body parts by region among studied elderly patients' pre –post the intervention

Parts of body		Pre (n=70)		Post (n=70)		X <sup>2</sup>	(p-value)
		No	%	No	%		
<b>0-2 region</b>	Not present	34	48.6	48	68.6	13.83	<b>.000**</b>
	Present	36	51.4	22	31.4		
<b>3-5 region</b>	Not present	25	35.7	34	48.6	10.80	<b>.001*</b>
	Present	45	64.3	36	51.4		
<b>6-10 region</b>	Not present	36	51.4	49	70.0	14.59	<b>.000**</b>
	Present	34	48.6	21	30.0		
<b>11-13 region</b>	Not present	36	51.4	50	71.4	17.24	<b>.000**</b>
	Present	34	48.6	20	28.6		
<b>14-16 region</b>	Not present	25	35.7	35	50.0	8.40	<b>.004*</b>
	Present	45	64.3	35	50.0		

\*: Significant

\*\*: Highly significant

Table (5): Total level of itching among elderly patients pre –post the intervention

Level of itching	Pre (n=70)		Post (n=70)		X <sup>2</sup> Test	(p-value)
	No	%	No	%		
Mild ( 5-10)	3	4.3	31	44.3	54.0	<b>.000**</b>
Moderate (11-19)	67	95.7	39	55.7		

Severe ( 20-25)	0	0.0	0	0.0		
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\*: Significant

\*\* : Highly significant

Figure (1): Total mean score of itching among studied elderly patients pre-post the intervention

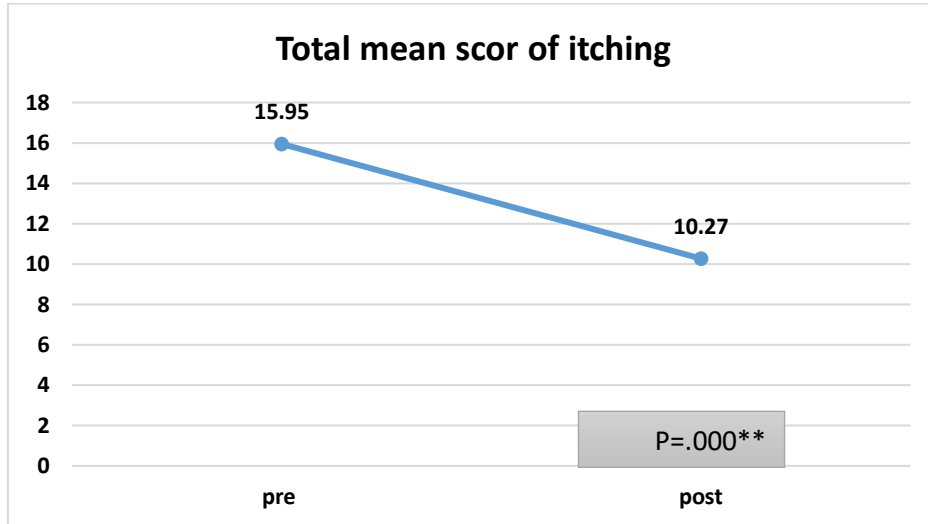


Table (6): Relation between itching mean difference of the studied elderly patients and their medical history

Medical history		Itching		Mann Whitney Test	P
		Mean	SD		
Have chronic diseases:	Yes	5.66	1.94	154	.846
	No	5.95	.57		
Total no. of chronic diseases:	< 2	5.73	.75	227.5	.137
	≥ 2	5.68	1.97		
Duration of chronic kidney diseases diagnosis	2-8 years	5.25	1.51	H=6.63	<b>.036*</b>
	9 -17 years	6.52	2.44		
	Not remember	5.65	0.68		
Onset of hemodialysis:	≤ one year	6.59	2.65	H=6.43	<b>.040*</b>
	< 5 years	5.09	1.55		
	5-10 years	5.75	1.31		

(H) Kruskal Wallis

(\* ) statistically significant at  $p \leq 0.05$

Table (7): Best fitting multiple linear regression model for itching score

Items	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	17.007	1.044		16.29	.000	14.922	19.092
residence	.157	.825	.037	.190	.850	-1.492	1.806
educational level	.318	.297	.155	1.07	.288	-.275	.911
Duration of chronic kidney diseases diagnosis	.480	.397	.146	1.210	.231	-.313	1.272
Onset of hemodialysis:	-.388	.307	-.152	-1.26	.211	-1.001	.225

R-square=0.14 Model ANOVA F=2.03 p<0.05

## DISCUSSION

**Concerning demographic characteristics of the studied elderly table 1** revealed that the mean age of the studied elderly was  $67.5 \pm 4.92$  years. The increasing mean age of the patients with end stage renal disease may reflect the universal trends of dialysis patients living longer due to improving health care systems and safety standards performed in dialysis clinics. This was in accordance with a study done in Europe, by **Pippias et al. (2015)** who found that the mean age of patients on dialysis was 62.0 years. This finding is also close to the mean reported by **Mohamed et al. (2021)** in Egypt (67.19 years).

**According to sex**, the present study results revealed that more than half of the studied elderly on hemodialysis (HD) were men. This result is in line with other studies conducted in Egypt and Chili which reported that elderly patients undergoing HD were predominantly males (**Rabie, 2015**). Additionally, the present study reported that, slightly more than half of the studied elderly on hemodialysis were currently unmarried. This may be related to loss of continuity and disrupted personal integrity, which includes changes in the body image and function, changes in intellectual, social and professional functions, and increased dependency. This result was in contrast with other studies which reported that the majority of participants were married (**Semaan et al., 2018**).

**In relation to place of residence**, this study showed that more than two thirds of the studied elderly on hemodialysis lives in rural areas and worked as farmers and handicraft that is supported by **Stanifer et al. (2014)** who found that chronic renal disease seems to be more prevalent in rural regions compared to urban settings. However, **EL Shahed et al. (2013)** mentioned that, around two-thirds of their studied HD patients were living in urban areas.

**Concerning educational level of the studied elderly**, **Table 1** indicated that, two fifth of the studied elderly were illiterate, about one third of the studied elderly read and write, slightly more than one fifth had intermediate educational level and only 7.2% had high education. This study is in line with other studies conducted at hemodialysis unit in new Mansoura general hospital in Egypt by **Mahmoud et al. (2018) & Abd-Rabouh et al. (2017)** who reported that, about two fifth of elderly patients were illiterate.

**Concerning monthly income of the studied elderly**, **Table 1** indicated that, more than half of the studied elderly had insufficient monthly income, more than one third had sufficient monthly income and 11.4% had enough income and save. The high prevalence of financial hardship among patients on maintenance hemodialysis with or

without subsidy highlights the need for a more comprehensive approach to address ESRD in resource-limited settings (Bradshaw et al., 2019).

**Concerning the medical history of the studied elderly (table 2)**, the present study clarified that the majority of the studied elderly patients had chronic diseases other than renal failure with a mean of  $1.9 \pm 0.8$  diseases and the most commonly chronic diseases associated with hemodialysis were cardiovascular diseases, DM and Joint & bone diseases and hypertension. Cardiovascular disease is the leading cause of death in HD patients and the principal discharge diagnosis accompanying 1 in 4 hospital admissions (Cozzolino et al., 2016). These results were in agreement with a study conducted by Cha & Han (2020) who stated that the average number of comorbidities suffered by patients in study (alongside ESRD) was 0.96, ranging from 0 to 3 comorbidities and the most common comorbidity was hypertension.

**Concerning the renal failure and hemodialysis history of the studied elderly, Table 3** showed that, three fifth of the studied elderly were diagnosed with chronic kidney diseases from 2-8 years, reflecting the awareness of patients for proper time for seeking medical advice and also increase of awareness of primary health care physician about early detection and referral to nephrology specialists to identify a probable correctable cause and to prevent progression of CKD especially for those at high risk to develop CKD such as elderly patients. This study is not in line with a study conducted at dialysis centers in El Beheira Governorate, Egypt, by El-Ballat et al. (2019) who found that about great percentage of patients discovered their kidney problem when they required dialysis.

**Regarding causes of renal failure according physician diagnosis**, more than two fifth (42.9%) of the studied elderly and about one third of the studied elderly (32.9%) had renal failure as a result of hypertension and diabetes mellitus respectively. This result is similar to other studies at number of governorates in Egypt which reported that the main known cause of ESRD was HTN (33.4%), followed by DM (9.2%) in Menoufia and HTN (27.8%), followed by DM(20.1%) in Beheira governorate (Ahmed et al., 2020).

**Concerning the number of hemodialysis sessions per week**, the present study clarified that total studied elderly attended three hemodialysis sessions a week. A study conducted in Mansoura city, Egypt, by Mohamed et al. (2020) mentioned that all patients received hemodialysis three times per week that prolonged four hours for each session.

**Concerning the level of itching [duration, degree, direction, disability, distribution] among studied elderly patients pre –post the intervention, Table 4a** shows a highly statistically significant improvement in the level of itching of the studied elderly patients at the post program phase, regarding all items of itching including, duration of itching, degree of itching and direction of itching. This result is in agreement with a study conducted by Karadag et al. (2014) which used Itching Severity Scale (ISS) that contains (distribution; severity of itching and sleep disturbance caused by itching) and reported that, the application of baby oil on the dialysis patients' skin three times a week for one month had a positive effect on pruritus severity, and there was a significant difference between the intervention and control groups in this regard.

**Table 4b** shows highly statistically significant improvements in the disability due to itching of the studied elderly patients at the post program phase, regarding all items of disability due to itching including, sleep and leisure-social domains. The current study coincides with Lavery et al. (2016) who reported that nocturnal pruritus is common in patients under hemodialysis and negatively affects sleep quality.

**Table 4c** shows highly statistically significant improvement in the disability due to itching of the studied elderly patients at the post program phase, regarding housework-errands domain and a statistically significant improvement in the work-school domain. This finding is in line with a randomized controlled trial conducted by Fishbane et al. (2020) using the 5-D scale and mentioned that significant improvements from baseline at week 8 for intervention versus placebo were observed for disability (which includes effect of itch on sleep and activities related to leisure, housework/errands, and work/school).

**Table 4d** shows highly statistically significant improvements in the body parts by region (0-2 region, 6-10 region and 11-13 region) and statistically significant improvements in the body parts by region (3-5 region and 14-16 region). Thus, administering emollients especially baby oil on the skin of elderly patients on hemodialysis can

alleviate pruritus. In addition, for the emollients to have a preventative effect, patients should be encouraged to use them before symptoms of pruritus appear (Wu et al., 2015).

**Concerning total mean score of itching among studied elderly patients pre-post the intervention, Figure 1** revealed a highly statistically significant difference in the total mean score of itching among studied elderly patients pre-post the intervention. These results could be explained by the following reasons; nursing intervention including baby oil contains liquid paraffin with high moisturizing properties; accordingly, it can relieve or even treat this condition properly. This finding is in the same line with a study done in the HD unit of the state hospital located in Tunceli, a small province in the east of Turkey by Karadag et al. (2014) who found in this study that there was a significant difference between the intervention and control groups. Mokhtarabadi et al. (2017) conducted a study in Iran about effect of administration of baby oil on the severity of pruritus in hemodialysis patients and found that in the pre-intervention stage, the mean pruritus severity score of the intervention and control groups were  $5.87 \pm 2.43$  and  $6.21 \pm 2.29$ , respectively, which altered to  $3.37 \pm 2.11$  and  $6.28 \pm 1.96$  after the intervention, respectively ( $P < 0.001$ ).

**Regarding total level of itching among elderly patients pre-post the intervention, table 5** illustrated highly statistically significant improvements in the total level of itching among elderly patients pre-post the intervention regarding all levels of itching (mild, moderate and severe). This result is in agreement with a study conducted by Takahashi et al. (2018) who used the Japanese version of the 5-D itch scale for rating pruritus experienced by patients undergoing hemodialysis and found that there was statistically significant difference in improvements of pruritus in the experimental group compared to control group after 3 months of implementing nursing guidelines.

**Regarding relation between itching mean difference of the studied elderly patients and their medical history, Table 6** illustrated that there were statistically significant relation between itching mean difference of the studied elderly patients and their medical history regarding duration of chronic kidney diseases diagnosis and onset of hemodialysis ( $p < 0.05$ ). This result is in agreement with a study conducted by Raiesifar et al. (2019) in Shahid Beheshti Hospital, Iran, who found that there is a significant relationship between the length of time undergoing hemodialysis with itching and dry skin. Another opinion stated that most patients suffer from pruritus after years of hemodialysis, whereas in this study patients experienced pruritus after undergoing hemodialysis for 5-31 months (Muliani et al., 2021).

**To determine the factors associated with itching a series of linear regression analyses were developed. Table 7** clarified that the independent positive predictors for itching score were residence, educational level and duration of chronic kidney disease diagnosis. On the other hand, the onset of hemodialysis was an independent negative predictor. With no statistically significant predictor for itching score, the model explains 14% of the variation in itching score. In contrast with this study Rehman et al. (2018) conducted a study in Pakistan and reported that the multivariate linear regression analysis revealed that there was a statistically significant association between UP with age of patients ( $\beta = 0.031$ ; 95% confidence interval [CI] =  $0.002 - 0.061$ ;  $P = .038$ ) and duration of CKD ( $\beta = -0.013$ ; 95% CI =  $-0.023 - -0.003$ ;  $P = .014$ ); however, no other factors were found to be associated with CKD-associated pruritus.

## CONCLUSION

Based upon the findings of the present study and answers of the hypothesis, it was concluded that the nursing intervention including baby oil had great impact on the skin of elderly patients on hemodialysis and had greatly improved uremic pruritus at post intervention phase.

## RECOMMENDATIONS

*On the basis of the current study findings*, replication of this study using a randomized clinical trial design in order to confirm the findings and to provide a higher level of evidence of its findings. Further research is proposed

to examine the effectiveness of multiple-approach nursing interventions in improving uremic pruritus among elderly patients on hemodialysis.

## REFERENCES

1. Abd-Rabouh, M., Abd Elhameed, S., & Shebl, A. (2017). Relationship between fatigue and functional status of the elderly patients on Hemodialysis. *Mansoura Nursing Journal*, 4(2), 83-96.
2. Aboeldahab, S., Khalil, F., & Ezz Eldawla, R. (2021). Clinical and laboratory characteristics of elderly patients with pruritus. *Clinical, Cosmetic and Investigational Dermatology*, 1009-1015.
3. Ahdoot R. S., Kalantar-Zadeh K., Burton J. O., Lockwood M. B. (2022). Novel Approach to Unpleasant Symptom Clusters Surrounding Pruritus in Patients With Chronic Kidney Disease and on Dialysis Therapy. *Curr. Opin. Nephrol. Hypertens.* 31, 63–71. doi: 10.1097/MNH.0000000000000752
4. Ahmed, H. A., Zahran, A. M., & Issawi, R. A. (2020). Prevalence and etiology of end-stage renal disease patients on maintenance hemodialysis. *Menoufia Medical Journal*, 33(3), 766.
5. Bindroo, S., Rodriguez, B. S. Q., & Challa, H. J(2022). Continuing Education Activity. Available at :<https://europepmc.org/books/n/statpearls/article-28355/?extid=31536265&src=med>
6. Bradshaw, C., Gracious, N., Narayanan, R., Narayanan, S., Safeer, M., Nair, G. M., ... & Anand, S. (2019). Paying for hemodialysis in Kerala, India: a description of household financial hardship in the context of medical subsidy. *Kidney international reports*, 4(3), 390-398.
7. Cha, J., & Han, D. (2020). Health-related quality of life based on comorbidities among patients with end-stage renal disease. *Osong public health and research perspectives*, 11(4), 194
8. Cheng, A. Y., & Wong, L. S. (2022). Uremic Pruritus: From Diagnosis to Treatment. *Diagnostics*, 12(5), 1108.
9. Cozzolino, M., Mangano, M., Stucchi, A., Ciceri, P., Conte, F., & Galassi, A. (2018). Cardiovascular disease in dialysis patients. *Nephrology Dialysis Transplantation*, 33(suppl\_3), iii28-iii34.
10. El Shahed A, Sharf S, El Esbaee H, Roshdy M. (2013):"Hemoglobin Level, Associated Co-Morbidities and Quality of Life among Patients Undergoing Hemodialysis at One of the University Hospitals in Cairo Governorate." *World Applied Sciences Journal* 23(1): 29-36
11. El-Ballat, M. A. F., El-Sayed, M. A., & Emam, H. K. (2019). Epidemiology of end stage renal disease patients on regular hemodialysis in El-Beheira governorate, Egypt. *The Egyptian Journal of Hospital Medicine*, 76(3), 3618-3625.
12. Elman, S., Hynan, L. S., Gabriel, V., & Mayo, M. J. (2010). The 5-D itch scale: a new measure of pruritus. *British Journal of Dermatology*, 162(3), 587-593.
13. Fishbane, S., Jamal, A., Munera, C., Wen, W., & Menzaghi, F. (2020). A phase 3 trial of difelikefalin in hemodialysis patients with pruritus. *New England Journal of Medicine*, 382(3), 222-232.
14. Karadag, E., Kilic, S. P., Karatay, G., & Metin, O. (2014). Effect of baby oil on pruritus, sleep quality, and quality of life in hemodialysis patients: Pretest–post-test model with control groups. *Japan Journal of Nursing Science*, 11(3), 180-189.
15. Khan, T. M., Al-Haider, I., Syed Sulaiman, S. A., & Hassali, M. A. (2013). Linguistic validation of the 5D itching scale to Arabic in patients with end-stage kidney disease. *Journal of renal care*, 39(4), 222-227.
16. Kim, D., & Pollock, C. (2021). Epidemiology and burden of chronic kidney disease-associated pruritus. *Clinical Kidney Journal*, 14(Supplement\_3), i1-i7.
17. Lavery, M. J., Stull, C., Kinney, M. O., & Yosipovitch, G. (2016). Nocturnal pruritus: the battle for a peaceful night's sleep. *International journal of molecular sciences*, 17(3), 425.
18. Mahmoud, M., Hassan, N., Abd Elhameed, S., & Shebl, A. (2018). Relationship Between Pruritus and Quality of Life of Elderly Patients Undergoing Hemodialysis. *IOSR Journal of Nursing and Health Science*, 7(3), 73-82.
19. Martin, C. E., Clotet-Freixas, S., Farragher, J. F., & Hundemer, G. L. (2020). Have we just scratched the surface? A narrative review of uremic pruritus in 2020. *Canadian Journal of Kidney Health and Disease*, 7, 2054358120954024.
20. Mohamed, N., Sherif, W. I., El-Aziz, A., & Badran, H. M. (2020). EFFECT OF UREMIC PRURITUS EDUCATIONAL INTERVENTION ON KNOWLEDGE LEVEL FOR HEMODIALYSIS PATIENTS. *Mansoura Nursing Journal*, 7(1), 93-101.
21. Mohamed, R. A., Abdel-Salam, D. M., & Mohamed, S. F. (2021). Functional Disability and Their Associated Chronic Diseases among Elderly Patients Attending an Egyptian Family Practice Clinic. *Egyptian Journal of Community Medicine*, 39(4).

22. Mokhtarabadi, S., Shahabinejad, M., Sadeghi, T., & Kazemi, M. (2017). The Effect of administration of baby oil on the severity of pruritus in hemodialysis patients. *Medical-Surgical Nursing Journal*, 6(1).
23. Muliani, R., Vitniawati, V., & Rakhman, D. A. (2021). Effectiveness of Olive Oil with Virgin Coconut Oil on Pruritus Grade Scores Among Hemodialysis Patients. *International Journal of Advancement in Life Sciences Research*, 4(4), 25-33.
24. Panma, Y., Yetti, K., & Sukmarini, L. (2021). Application of Acupressure in Reducing Pruritus Scale in Hemodialysis Patients. *KnE Life Sciences*, 371-382.
25. Pecoits-Filho, R., Okpechi, I. G., Donner, J. A., Harris, D. C., Aljubori, H. M., Bello, A. K., ... & Johnson, D. W. (2020). Capturing and monitoring global differences in untreated and treated end-stage kidney disease, kidney replacement therapy modality, and outcomes. *Kidney international supplements*, 10(1), e3-e9. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S2157171619300152>
26. Pippias M, Jager K, Kramer A et al (2015): The changing trends and outcomes in renal replacement therapy: data from the ERAEDTA Registry. *Nephrol Dial Transplant*; 31:831–841. Available at: <http://www.sciencedirect.com>
27. Puneet A., Vinita G., Priyanka K., Jacek C. S., Stephan G., Mohamad G. (2021). Chronic Kidney Disease-Associated Pruritus. *Toxins*. 13(8):527. doi: 10.3390/toxins13080527.
28. Rabie E (2015): Patients' Satisfaction With Nursing Care In Hemodialysis Units. Master thesis. Faculty of Nursing. Alexandria university
29. Raiesifar, Z., Tahery, N., Shirzadegan, R., Baraz, S., Darabiyani, P., & Raiesifar, A. (2019). Assessment of skin manifestations in end-stage renal disease patients undergoing hemodialysis in Shahid Beheshti Hospital of Abadan and Vali-e-Asr Hospital of Khorramshahr. *Jundishapur Journal of Chronic Disease Care*, 8(1).
30. Rehman, I. U., Munib, S., Ramadas, A., & Khan, T. M. (2018). Prevalence of chronic kidney disease-associated pruritus, and association with sleep quality among hemodialysis patients in Pakistan. *PloS one*, 13(11), e0207758.
31. Reszke, R., Kiliś-Pstrusińska, K., & Szepletowski, J. C. (2021). Chronic Kidney Disease-Associated Itch (CKD-aI) in Children—A Narrative Review. *Toxins*, 13(7), 450.
32. Semaan, V., N oureddine, S., & Farhood, L. (2018). Prevalence of depression and anxiety in end-stage renal disease: A survey of patients undergoing hemodialysis. *Applied Nursing Research*, 43, 80-85.
33. Sinawang, G. W., Faizah, R., Alfaqih, M. R., & Hermanto, A. (2019). Efficacy of topical applications on reducing uremic pruritus: A systematic review. *Jurnal Ners*, 14(3), 252-255.
34. Singh, V. S., & Vinayadev, V. (2021). Effectiveness of baby oil therapy for uremic pruritus in hemodialysis patients. *Saudi Journal of Kidney Diseases and Transplantation*, 32(1), 163.
35. Song, J., Xian, D., Yang, L., Xiong, X., Lai, R., & Zhong, J. (2018). Pruritus: progress toward pathogenesis and treatment. *BioMed research international*, 2018.
36. Stanifer JW, Jing B, Tolan S, Helmke N, Mukerjee R, Naicker S, et al. (2014): "The epidemiology of chronic kidney disease in subSaharan Africa: a systematic review and meta-analysis." *The Lancet Global Health* 2(3): e174-e181. Available at: <http://www.thelancet.com>
37. Takahashi, N., Yoshizawa, T., Okubo, A., Kumagai, J., Kawanishi, H., Tsuchiya, S., ... & Ebata, T. (2018). Usefulness of the Japanese version of the 5-D itch scale for rating pruritus experienced by patients undergoing hemodialysis. *Renal Replacement Therapy*, 4(1), 1-10.
38. Vaidya, S. R., & Aeddula, N. R. (2021). Chronic renal failure. In *StatPearls [Internet]*. StatPearls Publishing. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK535404>
39. Wu, C. F., Hsiao, Y. C., & Ko, P. C. (2015). The effects of nonpharmacological treatment on uremic pruritus patients: A systematic review. *Advances in Nursing*, 2015.
40. Zhang, S., & Duan, E. (2018). Fighting against skin aging: the way from bench to bedside. *Cell transplantation*, 27(5), 729-738.