

Effectiveness of Self Care program for Patients with Nephrolithiasis on Their Practices Regarding Nutrition

Sabah Ahmed Amaar, Baghdad Hussein Mahmoud, Furat Hussein Mahmoud*

Department of Medical Surgical Nursing, Faculty of Nursing, Helwan University, Cairo, Egypt

*Corresponding author: Furat Hussein, Mobile: (+20) 01061819832, Email: furathu@hotmail.com

ABSTRACT

Background: One of the most common disorders of the urinary system and a significant cause of morbidity is nephrolithiasis.

Aim: This study aimed to assess the effects of a self-care programme for patients with nephrolithiasis on dietary practices. **Design:** A quasi-experimental study design.

Setting: The study was conducted at the urology department and urology outpatient clinic in Elhussein Hospital affiliated to Al-Azhar University Hospital Cairo, Egypt.

Subjects: A sample of (50) patients from both genders with nephrolithiasis ranging in age from 20 to more than 60 years old was collected from the urology out-patient clinic at El Hussein University Hospital.

Tools: Three tools were used to collect data include: Patients' interview questionnaire, Self-care knowledge assessment questionnaire and Self-care dietary practices questionnaire.

Results: 36% of the study subjects aged between 30 - < 40 while 4% less than 60 years. There was an improvement in patient knowledge post the self-care program than the pre-program in all items except the preventive strategies.

Conclusion: The total self-care practices of the research subjects pre- and post-program had a significant relationship, and the demographic information, total knowledge and practices pre- and post-education, and total practices pre- and post-self-care programme have a highly statistically significant positive correlation.

Recommendations: Encourage patients with nephrolithiasis for self-care management programs to provide healthy lifestyle. Patients suffering from nephrolithiasis should participate in ongoing educational programs. More studies with a bigger sample size are advised in order to attain generalisation.

Keywords: Nephrolithiasis, Nutrition, Self-care program.

INTRODUCTION

Nephrolithiasis is the term used to describe the formation of renal stones inside the kidneys. When these stones leave the renal pelvis and propagate into the bladder, urethra, and ureters, the resulting disorder is known as urolithiasis. Many nephrolithiasis patients can be treated with analgesics, antiemetic drugs, and expectant care. However, more and more intensive therapies are needed to treat stones linked to obstruction, renal failure, and infection ⁽¹⁾.

Although there are many different kinds of kidney stones, calcium oxalate or phosphate makes up 80% of the stones. Other forms of stones are formed of calcium oxalate or phosphate (80%) and are far less prevalent than uric acid (9%), struvite (10%), and cystine (1%) stones. Different risk factors, including food, past medical history, family and personal history of stones, environmental variables, drugs, and the patient's medical history, can cause different forms of stones ⁽²⁾.

Genes that may be implicated in the development of kidney stones have been discovered, and nephrolithiasis is known to be highly heritable and familial in character. Genes involved in renal tubular processing of lithogenic substrates, such as calcium, oxalate, and phosphate, and of inhibitors of crystallisation, such as citrate and magnesium, have been identified by genome-wide association studies and candidate gene investigations ⁽³⁾.

Urinary tract stones, also known as Urinary Stone Diseases (USDs), are among the most prevalent,

influential, painful, and recurrent disorders and chronic diseases. They are caused by a modern lifestyle, poor nutrition, improper drug use, and bad habits related to fluid intake. Sadly, USDs are still a major health concern. Larger stones can cause pain and even obstruct the urinary system, whereas smaller stones usually move through the body without causing any discomfort ⁽⁴⁾.

Self-care is giving individuals the tools they need to take care of their health, preserve their health, and, in the event of an illness, take prompt, appropriate action to avoid complications and hasten their recovery. Self-care may frequently also help with managing and minimising health issues, cutting down on medical expenses, and promoting a quicker recovery. In the end, self-care interventions reduce the incidence of disease and its effects, enhance general health, functional skills, and patient happiness, increase the use of health services, and lower overall health system expenditures ⁽⁵⁾.

The location, makeup, and size of the stone as well as patient-specific characteristics including profession, co-morbidities, and single kidney determine how the stone should be managed. One can consider all stone care to be acute, final, and preventative. Patients are educated as part of preventative care to reduce their chance of developing stone disease by making dietary and hydration modifications. Since nephrolithiasis has been linked to chronic dehydration, maintaining enough water is the

most important preventative measure. There is evidence that increasing fluid consumption reduces the occurrence of stones ⁽⁶⁾.

Because of their traditional holistic viewpoint, nurses are highly skilled in supporting patients' self-care needs. As such, they should take the lead in administering systematic educational interventions aimed at maintaining or improving the health and self-care goals of patients who have previously undergone clinical assessment for a chronic illness. The objectives of the interventions are self-monitoring (of symptoms or physiological processes) and decision-making (managing the treatment of the disease, an exacerbation, or its impact through self-monitoring) ⁽⁷⁾.

Significance of the study:

Renal colic is the cause of 80,000 ER visits annually in the UK and around 1% of hospital admissions globally. Urologists often treat the first episode, but due to nephrolithiasis' link to osteoporosis, diabetes, obesity, and hypertension, doctors are seeing more and more patients with this condition ⁽⁸⁾.

In the US, 1 in 11 persons suffer from the prevalent ailment nephrolithiasis. Over the past few decades, rates of both incidence and prevalence have increased. According to claims data from the urologic disease in America project, the cost of a nephrolithiasis diagnosis in 2000 was estimated to be \$3,494 per person. This means that the total direct cost of nephrolithiasis among employed individuals was \$4.5 billion. There is a documented lifetime risk of 2-5% in Asia, 8-15% in the West, and 20% in Saudi Arabia. Bladder calculi are more prevalent than upper urinary tract calculi in underdeveloped nations and the contrary is true in industrialised nations. Diet is thought to have a role in these disparities ⁽⁹⁾.

For thousands of years, people have suffered with urinary tract stones. In fact, kidney and bladder stones have even been discovered in Egyptian mummies. Urinary tract stone illness is treated in some of the oldest known medical writings and illustrations. Probably the most unbearably painful experience a person can have is acute renal colic. Pain that comes on suddenly is frequently compared to that of childbirth, fractured bones, gunshot wounds and burns, or surgery. About 1.2 million people suffer from renal colic annually, and it causes 1% of all hospital admissions ⁽¹⁰⁾.

The purpose of this study was to assess the effects of a self-care programme for patients with nephrolithiasis on dietary practices.

Research Hypothesis:

The self-care knowledge and practices of nephrolithiasis patients regarding nutrition will improve following the implementation of the self-care program.

SUBJECTS AND METHODS

This quasi-experimental research was carried out in the Urology Department and Urology Outpatient Clinic, Elhussein Hospital, Al-Azhar University Hospital Cairo, Egypt. A sample of 50 patients from both genders with nephrolithiasis ranging in age from 20 to more than 60 years old were collected from the Urology Outpatient Clinic at El Hussein University Hospital.

Sample Size Calculation

The number of patients with nephrolithiasis were 250 patients. The following factors were considered in the calculation: $N = \text{Population size} = 250$. Expected frequency = 50%. Acceptance Error = 10% Confidence coefficient = 95%. Calculating the sample ratio according to the following formula $n = Nx (20/100)$. $n = 250 \times 20/100 = 50$.

Inclusion criteria: 1. Fully conscious. 2. Ability to follow directions, be attentive, communicate vocally, and no associated diseases with any conditions. 3. Agree to participate in the study.

Exclusion criteria: 1. Patients with a history of bleeding. 2. A bladder infection that is active. 3. Maternity. 4. Severe cerebral vascular illnesses or mental illnesses that may impair cognition.

Data collection tools: Three instruments were employed to gather information:

Tool I: Patients' interview questionnaire: This instrument was created to evaluate the patients' health state after a comprehensive analysis of relevant literature. It is divided into the following two parts:

Part 1: Patients' demographic data included their age, gender, marital status, place of residence, education, and employment.

Part II: Patients' medical data included kind of linked chronic conditions, past hospital admission with urinary tract stones, frequency of recurrence, modalities of treatment, stone side, number of stones, stone size and location of stones.

Tool (II): Self-care knowledge assessment questionnaire that was created by the researchers following an assessment of pertinent literature. Thirteen questions were asked on the definition of nephrolithiasis, its origins, risk factors, symptoms, and variables that impact the development of stones. Other topics included diagnostic testing, factors that prevent the formation of stones, recurrence of stones, and management strategies.

Scoring system: The following were the answers and their scores: The range of marks was 0 to 13, with 1 point

awarded for a valid response and 0 for a wrong one. After adding up all of the marks, a percentage was determined for each participant, and the results were evaluated as follows: A satisfactory degree of understanding $\geq 75\%$ inadequate degree of knowledge $< 75\%$.

Tool III: Self-care dietary practices questionnaire that was adopted from Mahmoud *et al.* ⁽¹⁰⁾. It splits into the following four subscales:

1-Self-care practices regarding consumption of permitted foods: It is a likert scale with four responses: daily (3 points), weekly (2 points), monthly (1 point), and never (0 point). It had eight elements on eating white meat, fresh fruits and vegetables, fish and sea foods, fibre like oats/bran, egg, liver, veggies like spinach/turnips, and whole grains.

2-Self-care practices regarding consumption of restricted foods: It is a four-point scale with four responses: never take it (3 points), monthly (2 points), weekly (1 point), and daily (0 point). It included eleven things related to eating canned food, salty foods, quick meals, sweetened foods, carbs, milk and dairy products, red meat, chocolate, citrus foods like lemon and orange, and foods high in oxalates like tomatoes and legumes.

3-Self-care practices regarding consumption of fluids: It is a likert scale with four responses: daily (3 points), weekly (2 points), monthly (1 point), and never (0 point). It comprised ten topics such as drinking lots of fluids during hot weather, fever, diarrhoea, workouts, considerable physical exertion, avoiding drinking water from unsafe sources, avoiding cola, avoiding stimulants such as tea and coffee, and drinking fresh fruit juice such as cranberry juice. Check the amount of urine that should not be less than 2.5 litres per 24 hours, and replenish the lost fluid while working in hot locations such as the kitchen or oven for extended periods of time. Drink plenty of fluids before and after meals, particularly before and after you wake up.

4-Common self-care practices regarding nephrolithiasis: It is a three-point scale with three responses: generally done (2 points), rarely done (1 point), and not done (0 point). It included 11 items such as eating balanced meals, exercising regularly, getting regular checkups, maintaining a normal weight, not smoking, not drinking alcohol, taking medicine with a prescription, adhering to a medication system, adhering to a diet regimen, seeking medical help as needed, and avoiding excessive intake of calcium tablets and vitamin D & E.

Scoring system: Self-care practices surrounding permissible food consumption (8 items): 8 items x (0-3) = scores ranging from 0 to 24 Self-care practices

addressing restricted food consumption (10 items): 10 items x (0-3) = scores ranging from 0 to 30 Self-care practices for fluid consumption (10 items): 10 items x (0-3) equals scores ranging from 0 to 30. Common nephrolithiasis self-care practices (11 items): 11 items x (0-2) = scores ranging from 0 to 22.

Total self-care practices: Total scores varied from 0 to 108, and these numbers were translated to percentages and classified as follows: $\geq 75\%$ of practices are satisfactory and $< 75\%$ of practices are unsatisfactory.

Validity: Five academic experts in adult health nursing (medical surgical nursing) from the Faculty of Nursing were asked to assess the validity of the instruments. Expert replies for content validity were categorised as either agreeing or disagreeing, with the purpose of determining the tools' relevance, clarity, completeness, and comprehensiveness. Following a review of their input, a final questionnaire was created and administered.

Reliability: Ten percent (5) of the patients were examined using the pre-established questionnaire to determine the reliability of the instruments. The same sample was tested again after four weeks, and the findings were consistent each time.

Pilot Study: To assess the effectiveness, dependability, clarity, and application of the tools, a pilot study including five patients, or 10% of the sample size, was conducted. Based on the findings of the pilot study, the tools were modified. Because the research instruments were not changed, participants in the pilot study were not eliminated from the overall sample.

Field Work: After outlining the goal of the study, the researchers received official authorization to perform it from the hospital management and the Head of the Urology Outpatient Clinic, El-Hussein Hospital. The study was conducted in four stages: planning, executing, assessing, and reviewing. From the start of June 2023 until the end of September 2023, a total of four months were dedicated to these stages. Three times a week, from 9:00 a.m. to 1:00 p.m., the researchers were accessible in the study areas. It took around thirty minutes to complete the structured interview questionnaire.

The Self Care program was done in four phases:
Assessment phase: After conducting one-on-one interviews with each subject and outlining the purpose of the study, the researchers invited participation. After meeting the subjects, they completed the questionnaire to determine their condition, gather personal information, and gauge the patient's state. The

information gathered at this stage served as the program's foundation.

Planning phase: The programme was explained to the patients by the researchers based on the findings of the evaluation phase once the patient condition was determined. Its goal was to raise patients' nutritional performance and understanding. Patients with nephrolithiasis should be able to: at the conclusion of the programme give a definition of nephrolithiasis and list its causes, risk factors, and symptoms. Recognise the symptoms and indicators of renal lithiasis. Determine the nephrolithiasis treatment options and necessary examinations. Enumerate the most frequent recurring types of stones and the elements that contribute to their production. Talk about the management and preventive strategies for stone recurrence. Describe patient-manageable self-care techniques.

Implementation phase: To ensure that the subject could comprehend the programme, it was explained in easy Arabic. Patients were questioned one-on-one by researchers. As you planned the training sessions with them, the goal of the study was explain and they completed the pre- and post-program study materials. Individual interviews with each patient were initiated by the researchers. Patients were seen by the researchers on Saturdays, Wednesdays, and Thursdays. The researchers divided the study group into small groups, with five to ten patients in each group, and then the booklet was used to build the self-care programme. The programme sessions were divided into five sessions for each group. This was done after the study tools were completed. Additionally, the programme booklet was given to the patients by the researchers.

Evaluation phase: After a month of programme implementation, the study group underwent the final

phase, which involved utilising the same pre-test instruments for knowledge and self-care activities to assess the program's impact.

Administrative design: The present study was carried out after taking an official permission from the administrators of the study setting at the Urology Department and Outpatient Clinic at Elhussein Hospital. An official letter taken from the Faculty of Nursing, Helwan University after the aim of the study was explained clearly. The study was approved by the ethical committee of Faculty of Nursing, Helwan University (N0.35) by date 10-7-2023.

Ethical considerations: The participants in the study who agreed to participate were informed about the goals and purpose of the investigation by the researchers. The research subjects were advised that they might opt out of the study at any moment and that their participation was completely voluntary. The data was collected only for research purposes and was destroyed following analysis. Throughout the course of the investigation, the Helsinki Declaration was adhered to.

Statistical analysis:

SPSS V. 22.0 was used for all statistical analyses. Before doing any computations, the data were checked for normality of distribution. The mean \pm standard deviation (SD) was used to express continuously distributed and normally distributed data. Both percentages and numbers were used to convey categorical data. Variables with categorical data were compared using the Chi-square test. The cutoff point for statistical significance was $p \leq 0.05$.

RESULTS

Figure (1) illustrated that 36% of the study subjects their ages ranged between 30 - < 40, while (4%) of them their ages were less than 60 years.

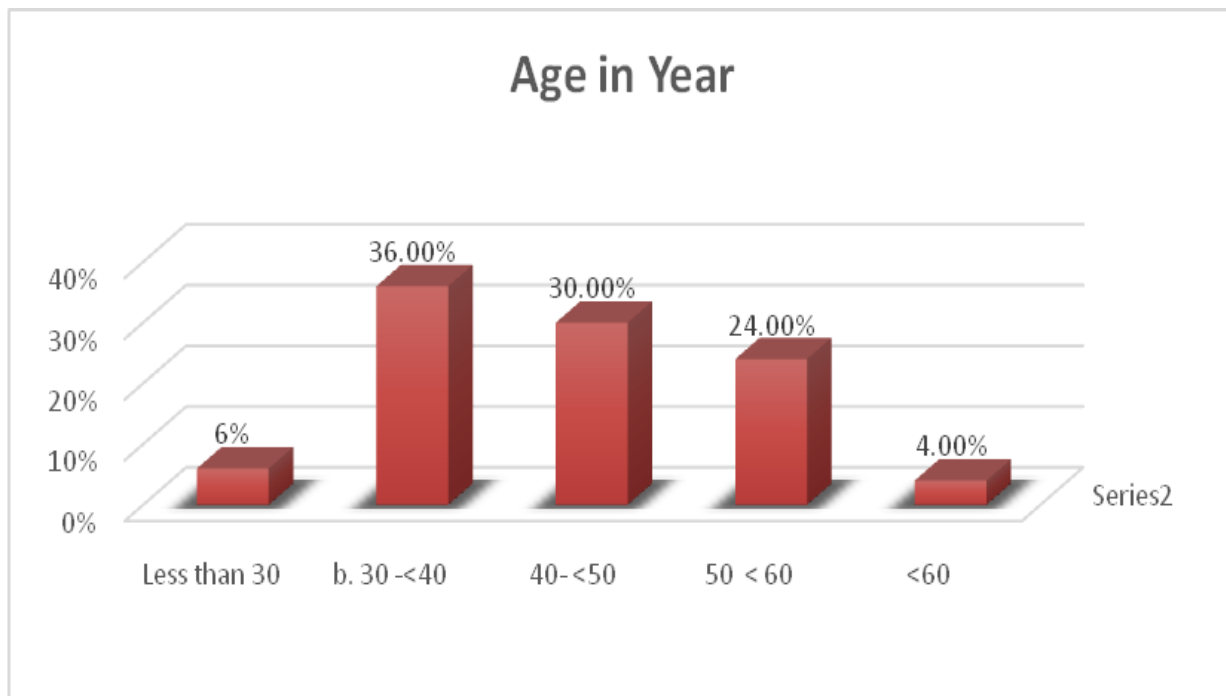


Figure (1): Percentage distribution of age of the study subjects (n= 50).

Table (1) showed that 54.0% of the studied subjects were males, while 60% of them were married. In relation to occupation, 26.0 % of them are housewives. 42.0 % of them had secondary school, 84% lived in urban place and 58% of them were not smokers.

Table (1): Frequency and percentage distribution of the demographic characteristics of the study subjects (n = 50)

Items	N	%
Gender		
Male	27	54
Female	23	46
Marital Status		
Single	4	8
Married	30	60
Divorced	7	14
Widow	9	18
Education		
Read and write	12	24
Not read and write	11	22
Secondary	21	42
University degree	6	12
Occupation		
Worker	19	38
Housewife/Not Working	13	26
Retired	9	18
employee	9	18
Residence		
Urban Area	42	84
Rural area	8	16
History of smoking		
Yes	21	42
No	29	58

Table (2) revealed that the mean of the type of stones was 2.400 ± 1.178 and 3.580 ± 1.808 of the risk factors of kidney stone.

Table (2): Medical data of the studied subjects (n = 50)

Medical characteristics data	Mean ± Std. Deviation
First time of nephrolithiasis formation.	1.740 ± .443
Suffering from nephrolithiasis formation for long period.	1.420 ± .498
Family member suffer from nephrolithiasis formation.	1.740 ± .443
Type of stone.	2.400 ± 1.178
Risk factors of kidney stone.	3.580 ± 1.808
Co-morbid diseases.	1.280 ± 1.107
History of previous surgery.	1.860± .350
Previous hospitalization.	1.740 ± .443
Duration of disease.	1.820 ± .388
Number of stones.	1.380 ± .490
Stone size.	1.720 ± .757
Previous Methods of treatment if present.	1.880 ± 1.154
Total Mean ± Std. Deviation	1.880 ± .608

Table (3) explained that regarding patients knowledge, there were a highly statistically significant improvement in patient knowledge post- the self-care program than pre- the program in all items except in preventive strategies at p-level ≤ 0.05 with t-values of 3.280, - 2.941, - 5.235, - 6.091, 1.565, - 9.061 & 4.046 respectively.

Table (3): Frequency and percentage distribution of the patients' knowledge pre- and post- the self-care program (n = 50)

Patients' knowledge	Pre- the program		Post- the program		t- value	P-value
	N	%	N	%		
- Meaning of kidney stone A kidney stone is a hard mass A kidney stone is a soft mass	31 19	62.0 38.0	40 10	80.0 20.0	3.280	. 0.002*
- Risk factors of stone formation Genetic Kidney disease related Systemic disease Hyperparathyroidism Renal tubular acidosis Sarcoid	13 5 16 3 12 1	26.0 10.0 32.0 6.0 24.0 2.0	10 5 11 3 12 9	20.0 10.0 22.0 6.0 24.0 18.0	- 2.941	0.005*
Types of kidney stones Calcium oxalate Calcium phosphate Ammonium phosphate Cystine	28 20 20 -	56.0 40.0 4.0 -	16 10 12 12	32.0 20.0 24.0 24.0	- 5.235	0.000**
Signs/ Symptoms Pain in the side of abdomen or groin – men may have pain in their testicles. A high temperature. Feeling sweaty. Severe pain that comes and goes. Feeling sick or vomiting. Blood in your urine. Urine infection	50 0 0 0 0 0	100 0 0 0 0 0	23 6 10 3 7 1	46.0 12.0 20.0 6.0 14.0 2.0	- 6.091	0.000**
Preventative strategies Stay hydrated Eat more calcium-rich foods Eat less sodium Eat fewer oxalate-rich foods Eat less animal protein Avoid vitamin C supplements Explore herbal remedies	28 2 3 4 1 3 9	56.0 4.0 6.0 8.0 2.0 6.0 18.0	19 11 4 8 3 5 -	38.0 22.0 8.0 16.0 6.0 10.0 -	1.565	124.
6.Factors that increase the formation of stones Family or personal history Dehydration Certain diets Obesity Digestive diseases and surgery Other medical conditions	46 4 0 0 0 0	92.0 8.0 0 0 0 0	7 13 5 8 3 14	14.0 26.0 10.0 16.0 6.0 28.0	- 9.061	0.000**
Methods of treatments Medication and fluid ESWL Surgery Endoscope	2 0 48 0	4.0 0 96.0 0	13 2 35 0	26.0 4.0 70.0 0	4.046	0.000**

*: Significant at $P \leq 0.05$

** : Highly significant at $P < 0.001$

Table (4) clarified that there was a highly statistically significant correlation between the total mean score of patients' knowledge pre- and post- the self-care program at $P \leq 0.05$.

Table (4): Total mean score of patients knowledge pre and post the program (n= 50)

Total Patients knowledge	Mean \pm Std. Deviation	X ² - value	P-value
Total Patients knowledge pre the program	13.7000 \pm 3.85582	-6.281	0.000**
Total Patients knowledge post the program	18.1800 \pm 7.74251		

Table (5) demonstrated that there were a highly statistically significant relation of all items regarding dietary assessment of the studied subjects at $P \leq 0.05$.

Table (5): Frequency and percentage distribution regarding dietary assessment of studied subjects pre- and post- the program (n= 50)

Dietary assessment items	Pre-program		Post-program		t- value	P-value
	N	%	N	%		
Drinking plenty of fluid: 2-3 quarts/day						
Yes	16	32.0	27	54.0	3.718	0.001*
No	34	68.0	23	46.0		
Limit foods with high oxalate content						
Yes	21	42.0	30	60.0	3.280	0.002*
No	29	58.0	20	40.0		
Eat enough dietary calcium						
Yes	27	54.0	45	90.0	5.250	0.000**
No	23	46.0	5	10.0		
Avoid extra calcium supplements						
Yes	26	52.0	40	80.0	4.365	0.000**
No	24	48.0	10	20.0		
Eat a moderate amount of protein						
Yes	14	28.0	23	46.0	3.280	0.002*
No	36	72.0	27	54.0		
Avoid high salt intake						
Yes	11	22.0	23	46.0	3.934	0.000**
No	39	78.0	27	54.0		
Avoid high doses of vitamin C supplements						
Yes	28	56.0	37	74.0	3.280	0.002*
No	22	44.0	13	26.0		

Table (6) showed that there were a highly statistically significant relation of most items regarding self-care nutritional practices of the studied subjects at $P < 0.001$

Table (6): Percentage distribution of patients nutritional practices pre- and post-self-care program among the studied subjects (n=50)

Patients self-care practices regarding permitted and restricted food	Pre- the program				Post- the program				t-value	P-value
	Daily	Weekly	Monthly	Never take it	Daily	Weekly	Monthly	Never take it		
Eat white meat	0	96.0	4.0	0	6.0	90.0	4.0	0	1.769	0.000**
Eat fish and sea food	0	74.0	26.0	0	10.0	64.0	26.0	0	2.333	0.000**
Take fresh fruits	32.0	44.0	24.0	0	48.0	40.0	12.0	0	3.093	0.000**
fiber such as oats / bran	54.0	40.0	6.0	0	66.0	30.0	4.0	0	2.447	0.000**
Eat egg	22.0	78.0	0	0	48.0	52.0	0	0	4.149	0.000**
Eat liver	0	2.0	32.0	66.0	18.0	16.0	30.0	36.0	5.491	0.005*
Take vegetables like Spinach / turnips	0	10.0	40.0	50.0	34.0	30.0	28.0	8.0	7.664	.982
Eat whole grains	8.0	18.0	18.0	56.0	20.0	40.0	18.0	22.0	4.874	0.008
Drink canned food	0	4.0	14.0	82.0	0	0	14.0	86.0	1.429	0.000**
Eat fast meals	0	0	2.0	98.0	0	0	0	100.	- 1.000	733.
Take salty foods	82.0	18.0	0	0	50.0	18.0	0	32.0	- 4.802	0.001**
Eat sweetened food	36.0	14.0	50.0	0	6.0	22.0	72.0	0	- 4.383	.493
Patients practices regarding fluid intake										
Drink Plenty of fluids in hot weather, sweating, hard work	0	4.0	32.0	64.0	42.0	4.0	28.0	26.0	5.905	.804
Drink large amount of fluids in the case of fever and diarrhea	14.0	26.0	18.0	42.0	54.0	26.0	10.0	10.0	5.621	0.000**
Drink water before bedtime and when you wake up .	62.0	18.0	20.0	0	76.0	10.0	14.0	0	2.646	.189
Drink enough fluids with or between meals	22.0	34.0	34.0	0	64.0	26.0	10.0	0	5.729	0.000**
Reduce drinking cola drinks	74.0	10.0	16.0	0	54.0	14.0	30.0	2.0	- 3.569	0.000**
Reduce the consumption of stimulants such as tea and coffee	0	0	0	100.0	4.0	2.0	2.0	92.0	1.927	0.000**
Increase the intake of juices such as cranberry juice	0	4.0	16.0	80.0	2.0	6.0	22.0	70.0	2.064	0.000**
Avoid drinking water from unhealthy resources	28.0	44.0	20.0	8.0	42.0	38.0	20.0	0	3.452	0.000**
Check the amount of urine that should not be less than 2.5 liter/ 24 hours	0	0	0	100.	10.0	8.0	6.0	76.0	1.065	0.000**

Cont'd table (6): Percentage distribution of the patients nutritional practices pre- and post-self-care program among the studied subjects (n=50)

Patients' self-care practices regarding nephrolithiasis	Pre- the program			Post- the program			t-value	P-value
	Usually done	Occasionally done	Not done	Usually done	Occasionally done	Not done		
Keep my weight within normal range.	18.0	14.0	68.0	26.0	14.0	60.0	2.064	0.044
Do regular checkups even when I don't get sick	0	4.0	96.0	0	16.0	84.0	2.585	0.013
Do not smoke	2.0	7.0	91.0	66.0	8.0	26.0	11.241	0.000**
Don't drink alcohol	58.0	0	42.0	89.0	11.0	0	5.957	0.000**
Taking medicine with a prescription	78.0	6.0	16.0	100.0	0	0	3.569	0.001**
Follow my medication system	18.0	22.0	60.0	40.0	28.0	32.0	4.214	0.000**
Follow my diet regimen	14.0	34.0	52.0	34.0	38.0	28.0	3.831	0.000**
Ask for medical help if you notice signs and symptoms of kidney stones	42.0	58.0	0	68.0	32.0	0	4.149	0.000**
Avoid excessive intake of calcium tablets, vitamin D & E	38.0	62.0	0	8.0	64.0	28.0	5.957	0.000**

Table (7) revealed that there were a highly statistically significant correlation of total self-care practices of the studied subjects' pre- and post- the program at $P < 0.001$.

Table (7): Total mean scores of the total patients practices pre and post the self-care program (n = 50)

Total Patients practice	Mean ± Std. Deviation	X ² - value	P-value
Total Patients practice pre the self-care program	27.3600± 5.49865	10.144	0.000**
Total Patients practice post the self-care program	22.8400± 4.06759		

Table (8) showed a highly statistically significant positive correlation between the demographic data, total knowledge and practice pre- and post- the program.

Table (8): Correlation between patient's demographic characteristics, their knowledge and practice pre- and post the program (n = 50)

	Age in years	Gender	Occupation	Education level	History of smoking	Patient knowledge pre-program	Patient knowledge post program	Patient practice pre-program	Patient practice post program
Age in years	1.000	** .825	** .899	** .879	** .895	** .840	** .933	** .943	** .684
Gender	-----	1.000	** .800	** .810	** .785	** .819	** .856	** .869	** .605
Occupation	-----	-----	1.000	** .949	** .882	** .821	** .954	** .953	** .720
Education level	-----	-----	-----	1.000	** .872	** .816	** .948	** .938	** .678
History of smoking	-----	-----	-----	-----	1.000	** .794	** .855	** .860	** .778
Patient knowledge pre-program	-----	-----	-----	-----	-----	1.000	** .894	** .891	** .705
Patient knowledge post program	-----	-----	-----	-----	-----	-----	1.000	** .993	** .691
Patient practice pre-program	-----	-----	-----	-----	-----	-----	-----	1.000	** .719.
Patient practice post program	-----	-----	-----	-----	-----	-----	-----	-----	1.000

** . Correlation is significant at the 0.001 level (2-tailed).

DISCUSSION

Diet is one of the many environmental variables that might impact the frequent medical illness known as nephrolithiasis. Dietary modification has become an essential technique for the medical therapy of nephrolithiasis since nutritional habits are crucial in the genesis and recurrence of kidney stones illness. The goal of dietary recommendations is to lower most lithogenic risk factors, which include uric acid, calcium phosphate, and calcium oxalate, which are the main causes of hyper saturation in urine ⁽¹¹⁾.

In order to support and empower patients to improve their quality of life, the self-care management approach incorporates a number of techniques, including action plans, problem solving, self-monitoring, coping skills, stress management, experience sharing, coaching, motivation and confidence, positive feedback, and peer role models. When it comes for supporting and encouraging patients to self-medicate, nurses are crucial and play the most significant role in health education ⁽¹²⁾.

The results of the current study revealed that, more than half of the study subjects were males, while less than two thirds of them were married, and more than one quarter of them were house wives. About two fifth of them had secondary school, the majority of them lived in urban place and more than half of them were not smokers. As regards age, more than one third of them their ages ranged between 30 - < 40 while small percentage of them were less than 60 years. These findings are consistent with a research by **Mahmoud et al.** ⁽¹⁰⁾ who found that men made up more than two thirds of the study group. The physical difference between males and females may be the reason of this; the male urethra is longer than the female's, which may lead to urine buildup and stagnation in the bladder for extended periods of time.

Additionally, the age ranged of the patients in the current study did not match that of **Abbas** ⁽¹³⁾ study, which indicated that the majority of patients were between 40 and 50 years old. This finding may be explained by the fact that the prevalence of urolithiasis rose with age. The current research's findings also run counter to those of **Mahmoud et al.** ⁽¹⁰⁾ whose investigation revealed that two thirds of the study group and the control group lived in rural regions.

Other co-morbidities included obesity, metabolic syndrome, diabetes mellitus, arterial hypertension, and a higher risk of developing chronic kidney disease were linked to stone disease. Additionally, individuals with urolithiasis are more likely to experience multi-organ consequences such vascular calcifications, metabolic bone disease, and cardiovascular events ⁽¹⁴⁾. This research's findings are consistent with those of **El-Shishtawy and Mohamed** ⁽¹²⁾, who found that almost one-third (34% & 30%) of the patients in the study group and the control group respectively, had a positive family history of kidney stones. The whole study group (100%) of patients had previously

undergone extracorporeal shock wave lithotripsy (ESWL) therapy. In the control group, the majority of patients (98.0%) received therapy using ESWL. All 100 patients in the study and control groups had recurrent urinary tract infections, and 25% of them had hypertension.

The results of the current investigation made it clear that there was a strong statistical relationship between the patients' overall mean knowledge scores before and after the programme. **Rahmah et al.** ⁽¹⁵⁾ provided evidence to corroborate this, demonstrating a substantial correlation between the attitudes score and the knowledge score.

The results of the current study showed that, as compared to before the self-care programme, participants had better understanding of nephrolithiasis on all items. This is in line with **Mohammed et al.** ⁽¹⁶⁾ who claimed that the best method for reducing urinary tract stone recurrences is patient education. This is consistent with the findings of **Shah and Calle** ⁽¹⁷⁾ who showed that the introduction of the educational programme for the study group led to a considerable improvement in the patients' knowledge.

The present investigation revealed a highly statistically significant relationship between all items and the dietary assessment of the subjects. This finding is corroborated by **Krzemińska et al.** ⁽¹⁸⁾ who reported a weak but positive correlation between the degree of dietary adherence and the ability to take care of oneself.

Kidney stone occurrence in families with a high protein, sugar, and salt diet; cystinuria and urinary tract infections (UTIs) can primarily cause struvite stones in patients. Metabolic diseases (low urine volume, hyperoxaluria, and hypercalcemia), obesity may induce kidney stones, congenital anomalies (Medullary sponge kidney, horseshoe kidney and clogged ureteropelvic junction), hereditary factors (positive family history), and environmental factors (hot dry climate; persons working outside in warm weather are susceptible to stone development from excessive fluid loss). Additional, dietary variables linked to kidney stones include vitamin D, oxalate, and different types of drinks ⁽¹⁹⁾.

About the correlation between practice and knowledge, the study's findings clearly showed that there was a favourable association between practice and overall understanding. **Sedek et al.** ⁽²⁰⁾ observed no significant association between knowledge and practices, which contradicted this result. Additionally, the current study's findings align with those of **Rasouli-Ghahroudi et al.** ⁽²¹⁾ who demonstrated a strong and substantial link between knowledge and practice as well as attitude.

Based on the current study's results, self-care practices for nephrolithiasis have improved. These practices included eating balanced meals, exercising frequently, getting regular checkups, maintaining a normal weight range, taking prescription medications,

adhering to a medication schedule, following a diet plan, seeking medical attention when necessary, and avoiding consuming excessive amounts of calcium and vitamin D. Additionally, because the majority of the patients did not smoke and did not drink alcohol, there were statistically significant variations in the self-care practices score after the intervention regarding refraining from smoking and drinking. These results are corroborated by **Sohgaura and Bigoniya** ⁽²²⁾ where they concluded that nephrolithiasis could be prevented and its recurrence could be reduced by altering unhealthy behaviours, supervising medical professionals, exercising regularly, drinking plenty of water, and maintaining a nutritious diet.

CONCLUSION

The overall self-care practices of the research participants showed a very statistically significant positive association between pre- and post-program demographic data, as did the total knowledge and practice of the individuals before and after the programme.

RECOMMENDATIONS

- 1- Encourage patients with nephrolithiasis for self-care management programs to provide healthy lifestyle.
- 2- Patients suffering from nephrolithiasis should participate in ongoing educational programs.
- 3- More studies with a bigger sample size are necessary in order to reach generalisation.

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