Nutritional Status for Patients with Nephrolithiasis

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Abstract

Background:. Nephrolithiasis is a prevailing health issue of significant concern affecting millions of people globally. Over the last few decades, several dietary patterns have been associated with an increased risk of nephrolithiasis. **The aim** of this study was to assess the nutritional status for patients with nephrolithiasis. **Research design**: A descriptive research design was used. **Setting**: This study was conducted at Urology Outpatient Clinic at Zagazig University Hospitals, Sharqia Governate, Egypt. **Subjects**: A purposive sample of 100 patients with nephrolithiasis was selected from the mentioned setting. **Tools**: two tools were utilized for data collection, Patients' interview questionnaire, and questionnaire to assess the nutritional status for patient with nephrolithiasis**.** **Results**: Revealed that, more than three fifth (61.0%) of the studied patients less than fifty years. about three quarter of the studied patients educated, married and insufficient monthly income(72.0%, 73.0%,74.0% respectively).about three quarters (74.0%) of the studied patients had unsatisfactory total knowledge level regarding nephrolithiasis.Most (92.0%) of studied patient had poor consumption of permitted food. less than three quarters (73.0%) of studied patient had better consumption of restricted food. the most (85.0%) of study subjects had BMI>20 score. more than two third (70.0%) of studied patient had high risks for malnutrition. **Conclusion**: About three quarters of the studied patients **(**74.0%**)** had unsatisfactory total knowledge level regarding nephrolithiasis. Most (92.0%) of studied patient had poor consumption of permitted food. less than three quarters (73.0%) of studied patient had better consumption of restricted food. (70.0%) of studied patient had high risks for malnutrition. **Recommendations:** Implement routine screening for malnutrition among patient with recurrent kidney stones, especially those experiencing unintentional weight loss and poor appetite. Replicate the study across different health care settings and geographic regions to validate and generalize the results for nephrolithiasis patients.

Keywords: *Nephrolithiasis, and Nutritional status*

Introduction

Nephrolithiasis, also named kidney stone diseases, are solid masses that form in the kidney. It is a condition in which there is formation of stone in any Anatomical region of kidney due to the super saturation of urine and is usually characterized by severe pain sudden in onset **(Dahm et al., 2022).** Stones are mineral deposits in the calyces or the pelvis, free or attached to the renal papillae. They contain crystals and organic components, and they are made when urine is supersaturated with minerals **(Tamborino et al., 2024).** These stones can vary significantly in their chemical composition, with the most common types being calcium oxalate, uric acid, and cysteine stones. Understanding the chemical structure of each stone type is crucial for effective diagnosis and treatment **(Sun et al., 2025).**

Nutritional assessment can be defined as the interpretation from dietary, laboratory, anthropometric and

clinical studies. It is used to determine the nutritional status of individual or population groups as influenced by the intake and utilization of nutrients screening is used for the identification of malnourished individuals and nutrition interventions are used for the population subgroups at risk **(Cade& Margetts. 2023).**

Dietary intake, Diet plays a major role in the incidence of nephrolithiasis. Over the last few decades, several dietary patterns have been associated with an increased risk of nephrolithiasis. In particular, the Western-style diet (i.e., a diet high in fat, calories, and animal protein, and low in fiber and plant-based proteins) has been blamed for the increased incidence of kidney stones in Japan **(D'Ambrosio et al., 2022).** Anthropometrical methods occupy a meaningful role in assessing the nutritional status of persons with renal disease, are cost-effective screening techniques for describing body size and body composition **(Dumler, 2020).**

BMI is a nutritional indicator that allows the classification of individuals into categories ranging from low weight to obesity it has some limitations. It does not distinguish between body composition, for example, between fat and lean mass thus, the BMI of individuals with high lean mass (especially as a function of increased muscle tissue) might be included in the overweight range, although their high BMI does not present any risk to their health. BMI is also unable to assess the type of body fat distribution. Therefore, to perform more thorough assessments, other parameters muse be measured, such as WC and body fat percentage **(de Oliveira et al., 2014).** Lifestyle changes represent a cornerstone in obesity management. Obesity, as determined by body mass index (BMI) or waist circumference (WC), is a chronic, multifactorial disease According to the (WHO), a BMI $\geq$ 25.0 kg/m2 is defined as overweight, and a BMI $\geq$ 30.0 kg/m2 as obesity **(Siener& Metzner, 2023)**

Significance of the study:
The prevalence of nephrolithiasis has been increasing in recent years, affecting approximately 10% and 15% of the population with a higher frequency in men, at a ratio of 2–3:1 compared to women **(Carvalho et al., 2025).** It affects about 7%-13% in North America, 5%-9% in Europe and 1%-5% in Asia.in Egypt kidney stone occur as one every 1000 people **(Amin et al ., 2022).**

Aim of the study:
This study aimed to evaluate self-care practices and nutritional status for patients with nephrolithiasis**.**

Research question:
- What is the level of patients' knowledge regarding nephrolithiasis?
- What is the nutritional status for patients with nephrolithiasis?

Subjects and methods:
Research design:
A descriptive research design will be utilized to achieve the aim of this study and to answer the research questions.

Study setting:
It was conducted Urology Outpatient Clinic at Zagazig University Hospitals**.**
Study subjects:
A purposive sample of 100 patients with nephrolithiasis.
Inclusion criteria: Adult aged 18-60 years, both sexes, presence of kidney stone confirmed by computed tomography of kidneys, fully conscious, Agree to participate in the study.

Exclusion criteria: Patients with renal failure, tumors in kidney, severe cerebral vascular illnesses or mental illnesses that may impair cognition.

Tools of data collection

Tool I: Patients' interview questionnaire: it divided into three parts: **Part 1: Patients' demographic data** constructed from seven close ended questions asked about their age, gender, marital status, place of residence, education, Occupation, and monthly income.

 Part II: Patients' medical data which were composed of ten questions about previous medical history (previous diagnosis of kidney stone, number of recurrence**,** family history of kidney stone, previous diagnosis of urinary tract infection ,history of chronic diseases, types of chronic diseases, history of previous urinary tract surgeries, types of surgical intervention, previous hospital admission, and previous method of treatment) and fourteen questions about current health status involves three questions about stones type, number of stones, stone size and five questions about symptoms patient have like pain in back and side, blood in urine, vomiting ,difficulty urination ,and fever, two questions about follow up with nephrologist medication taken, and four questions about weight, height ,body mass index ,and waist circumference)

Part III: knowledge assessment questionnaire for patient with nephrolithiasis : it was adopted from (**Mahmoud et al., 2019)** and modified by the researcher which included twelve multiple choice questions about the definition of nephrolithiasis, its origins, risk factors, food increase and reduce risk for nephrolithiasis, amount of water, symptoms, complications, diagnostic testing, treatment options ,and management strategies**.**

The scoring system:

The total score of the knowledge was 12 grades (100%). if the patient answer is correct, patient would score one grade. if patient select "all of above", patient would score the final marks of the question. But, if patients select, "I don't know" patient score zero grade. Knowledge was considered satisfactory if the percent score was equal or above 70% and unsatisfactory if less than 70% based on statistical analysis.

Tool II: questionnaire to assess nutritional status for patient with Nephrolithiasis. It was divided into three parts :

Part 1: food frequency questionnaire: it was adopted from **(Amaar et al., 2023)**: is dietary assessment tool used to estimate an individual's habitual food and beverages consumption over a specified period it consist of :

Section A :consumption of permitted foods : had nine elements on eating animal proteins (chicken, fish and sea foods), diary , calcium rich food (milk cheese and yogurt) ,fresh fruits low in oxalate (apples and banana) , vegetables low in oxalate (carrots and cauliflower) , whole grains , citrus fruits(oranges and lemon)

The scoring system:

The total score is 27 grades (100%) each items had four responses: daily (3 points), weekly (2 points), monthly (1 point), and never (0 point).With better consumption of permitted food ≥ 70 % and poor consumption of permitted food dietary <70%.

Section B:consumption of restricted foods: included nine elements related to eating canned food(canned salmon), high salt foods(added to food) ,fast food and snakes, animal proteins(red meat, eggs), foods rich in oxalates (Spanish **,**nuts **,** and chocolate), sweetened foods(sweet potato, sweetened juices),caffeinated drinks (tea and coffee) ,and calcium supplements

The scoring system:

The total score is 27 grades (100%) each items had four responses: never take it (3 points), monthly (2 points), weekly (1 point), and daily (0 point).With better consumption of restricted foods ≥ 70% and poor consumption of restricted foods < 70 %.

Part2: biochemical measurements: it was adopted from **(de Oliveira et al., 2014) (Denyeif., 2024):it** included three questions about serum calcium level, uric acid level in blood and 24 hour urinary collection test(24 hour urinary calcium level , 24 hour urinary oxalate level , 24 hour urinary uric acid level, and 24 hour urinary citrate level).

The score system:
Normal =0, high=1, low=2.

Part3: malnutrition universal screening tool (MUST) to assess nutritional status for patient with nephrolithiasis:(Fiaccadori et al.,2021) : was a simple and quick method applicable by any health professional, with a high validity for early screening, ideally to antedate a comprehensive nutritional assessment and guide for intervention. Consist of three questions (the patient body mass index, weight loss in the past 3-6 months, and the acute disease effects on patient appetite and food intake for last 5 days.

The scoring system:
The total score was 6 grades (100%).Nutritional risk was assessed by the MUST that addresses: (1) current weight status using BMI, which is scored as 0 if >20 kg/m2, 1 if between 18·5 and 20 kg/m2 and 2 if < 18·5 kg/m2; (2) percentage weight loss over the previous 3–6 months is scored as 0 if < 5 %, 1 if between 5 and 10 % and 2 if >10 %; and (3) the acute disease effect is scored with 2 points if there has been, or if it is likely to be, no nutritional intake for >5 d. The scores given to each component are summed up and the total allows the categorization of patients as in Low risks for malnutrition (0), Medium risk (1) , High risks for malnutrition (<1) ; this score is used to guide patients' reassessment plan as well as the appropriate nutritional care plan.

Content validity and reliability:

Three experts in the fields of medical surgical nursing reviewed the tool's content for clarity relevance, comprehensiveness, applicability, understanding, and ease for, implementation. All recommended modifications were done. There was good internal consistency (reliability) of the tool and acronbach's alpha values were 0.809 for Patient knowledge and 0.*711* for Assessment of nutritional status.

Field work
The data collection phase lasted for 7 months during the period from the beginning of September 2024 to the end of march2025. The first phase of the work is the preparatory phase that done by meeting with nurses the mentioned siting after obtaining the official permissions, to know the average number of patients coming to outpatient clinics and working days and clarify the objective of the study and applied methodology to ensure their cooperation. The second phase that done by meeting the patient, each patient was met individually got a full explanation about the aim of the study and was invited to participate. The patient who gave his/her verbal informed consent to participate was handed the self-administered questionnaire and was instructed during the filling. The data were collected two days a week (Sunday and Tuesday) from 9:00 am to 12:00 pm, the time used for finishing the self- administered questionnaire ranged between 20-30minutes for each patient according to patients' physical and mental readiness.

Pilot study:
It included ten patients (10%) in the setting (urology outpatient's clinic at Zagazig university). The goal was to check the clarity, applicability, relevance and feasibility of the tools. And to identify the difficulties may be faced during the application. It also helped to estimate the time needed to fill in the sheets. Since no modifications were done.

Ethical consideration:

At the interview, each subject (patient) was informed about the purpose, benefits of the study, and they were informed that their participation is voluntary and they have right to withdraw from the study at any time without given any reason. In addition, confidentiality, and anonymity of the subjects were assured through coding of all data. The researcher assured that the data collected will be confidential and would be used only to assess the nutritional status for patients with nephrolithiasis. Ethical code (M.D .ZU.NU.R/253/1/8/2024)

Statistical Design:

The data obtained tabulated and statistically analyzed using SPSS, version 25.0. Quangbtitative data were expressed as the mean ± SD & (range), and qualitative data were expressed as absolute frequencies (number) & relative frequencies (percentage). Percent of categorical variables were compared using Chi square test (χ2) or Fisher's exact test when appropriate. Spearman's rank correlation coefficient (r) was calculated to assess relationship between various study variables, (+) sign indicate direct correlation & (-) sign indicate inverse correlation p-value < 0.05 was considered statistically significant (S), and p-value ≥ 0.05 was considered statistically insignificant (NS). Also, multiple linear regression analysis was used to compare two classes. All tests were two sided. P-value < 0.05 was considered statistically significant (S), and p-value ≥ 0.05 was considered statistically insignificant (NS).

Results:

According to **table (1):** Indicates that over three-fifths (61.0%) of the patients in the study were under 50 years old, with Mean± SD (44.29±10.70). However, about three-quarters (63%) were employed, and roughly two-thirds (65.0%) were men. Approximately three quarters (74.0%) had inadequate monthly income, according to the same data. Of the patients in the study, almost three quarters (72.0%) had a high level of education, roughly three quarters (77.0%) were married, and roughly three fifths (58.0%) lived in a rural location.

Table (2) Shows that , more than three fifth (63.0%) of the studied patients had diagnosed with kidney stones before this time, quarter (25.0%) of studied patient had diabetes and about half (46.0%) hypertension about half (49.0%) of studied patient had medication and fluid, about three fifth (59.0%) using analgesic, more than three fifth (62.0%) of studied patient had calcium oxalate stones, more than half (52.0%) had large formed stone size and two third (66.0 %) of the patients had multiple kidney stones, three quarters (75.0%) of studied patient had back or side pain, about three quarters (73.0%) nausea or vomiting, two thirds (65.0%) fever or high temperature, more than half (52.0%) dysuria and most (94.0 %) of the patients had follow up with nephrologist.

Table(3) demonstrate that about three quarters of the studied patients **(74.0%)** had unsatisfactory total knowledge level regarding nephrolithiasis with Mean± SD = 44.29±10.70.

Table (4) clarifies that about three fifth (58.0% & 57.0% respectively) of patient had consume permitted animal proteins weekly. Additionally, (more than two fifth 42.0%, 43.0% & more than three fifth 62.0% respectively) of the studied subjects never attain dairy calcium rich foods from milk, cheese and yoghurt. Regarding to consumption of fruits low in oxalate two fifth (40.0%) of studied patient had consumed it weekly. While vegetables low in oxalate, about three fifth (58.0%) never consumed it, (58.0%) had weekly consumed citrus fruit and about three fifth (58.0%) never had high fiber die. Majority (92.0%) of studied patient had poor consumption of permitted food with Mean± SD =13.0±4.01.

Table (5) Clarifies that, 42.0% and 55.0% respectively of study subjects had eating canned food and salty foods daily, 50% of patients eaten animal proteins (red meat) weekly, more than half (54%) had food rich in oxalate weekly, three quarters (75.0%) of them had caffeinated drinks daily and 64% of the sample never had calcium supplements with less than three quarters (73.0%) of studied patient had better

consumption of restricted food

Table (6) Indicates that, the majority (85.0%) of study subjects had BMI>20: score, about half (46.0%) of study subjects had 5-10% weight loss in the past 3-6 months, about three fifth(57.0%) of study subjects feel acutely sick right now, most (83.0%) of study subjects had intake of food been poor for the last 5 days therefore, more than two third (70.0%) of studied patient had high risks for malnutrition with Mean± SD =2.33±1.27.

Table (7) Shows that, there were high statistically significant differences between nutritional status measured by total malnutrition screening scores (MUST) of study subjects and their gender (p< 0.01) while there were no statistical differences between nutritional status and patients age occupation and educational level.

Table 1: Frequency and Percentage Distribution of the Studied Patients according to their Demographic Characteristics (n=100).

Demographic characteristics	No	%
Age (years)		
<50	61	61.0
>-50	39	39.0
Mean± SD 44.29±10.70		
Range 22-59		
Gender		
Male	65	65.0
Female	35	35.0
Occupation		
Working	63	63.0
Not working	37	37.0
Monthly income		
Sufficient	26	26.0
Insufficient	74	74.0
Educational Level		
Educated	72	72.0
Illiterate	28	28.0
Marital status		
Single	27	27.0
Married	73	73.0
Place of residence		
Urban	42	42.0
Rural	58	58.0

Table (2): Medical data: Frequency and Percentage Distribution of the Studied Patients according to previous and current Medical History (n=100).

previous Medical History	No	%
Personal history of kidney stones.		
Yes	63	63.0
No	37	37.0
number of recurrences (n= 63)		
Once	32	32.0
Twice	18	18.0
More than twice	13	13.0
Family history of kidney stones		
Yes	65	65.0
No	35	35.0
History of urinary tract infection		
Yes	60	60.0
No	40	40.0
Presence of chronic diseases		
Diabetes	25	25.0
Hypertension	46	46.0
Cardiac diseases	11	11.0
Gout	9	9.0
Previous urinary tract surgeries		
Yes	16	16.0
No	84	84.0
Type of surgical intervention)		
Kidney stone removal	10	10.0
Ureteric double J stent	4	4.0
Nephrectomy	2	2.0
Previous hospitalization		
Yes	32	32.0
No	68	68.0
Methods of treatment for kidney stone		
Medication and fluid	49	49.0
Analgesic	59	59.0
Chock wave lithotripsy (ESWL)	29	29.0
Surgery	10	10.0
Endoscope	12	12.0
Current Medical History	**No**	**%**
Types of stones formed		
Calcium oxalate stones	62	62.0
Calcium phosphate stones	10	10.0
Uric acid stones	13	13.0
Cysteine stones	1	1.0
Struvite stones	14	14.0
Stone size		
Small	18	18.0
Medium	30	30.0
Large	52	52.0
Number of stone		
Single	34	34.0
Multiple	66	66.0
Present symptoms		
Back or side pain	75	75.0
Hematuria	46	46.0
Nausea or vomiting	73	73.0
Dysuria	52	52.0.
Fever or high temperature	65	65.0
Follow up with nephrologist		
Yes	94	94.0
No	6	6.0

Table (3): Frequency and Percentage Distribution of Satisfied Knowledge among Patients with Nephrolithiasis (n=100).

Satisfied knowledge	No	%
Definition of nephrolithiasis	61	61.0
Types of nephrolithiasis	19	19.0
Risk factor for nephrolithiasis	30	30.0
Relationship between stone formation and diet	59	59.0
Foods reduces the chance of stone formation	46	46.0
Foods increase the chance of stone formation	42	42.0
Amount of water should drink throughout the day	37	37.0
Signs/symptoms of nephrolithiasis	59	59.0
Complications of nephrolithiasis	33	33.0
Diagnostic tests for nephrolithiasis	44	44.0
Prevention of nephrolithiasis	81	81.0
Treatment methods for kidney stones	62	62.0
≥ 70 % Satisfactory	26	26.0
<70Unsatisfactory	74	74.0
Mean± SD	44.29±10.70	

Table (4): Frequency and Percentage Distribution of permitted foods to assess the nutritional status among Patients with Nephrolithiasis (n=100).

Permitted food	Never		Monthly		Weekly		Daily	
	No	%	No	%	No	%	No	%
Animal proteins								
Chicken	18	18.0	21	21.0	58	58.0	3	3.0
Fish and sea foods	14	14.0	28	28.0	57	57.0	1	1.0
Dairy and calcium rich food								
Milk	42	42.0	24	24.0	15	15.0	19	19.0
Cheese	43	43.0	5	5.0	16	16.0	36	36.0
Yogurt	62	62.0	18	18.0	16	16.0	4	4.0
Fruits low in oxalate (Apples, banana)	11	11.0	31	31.0	40	40.0	18	18.0
Vegetables low in oxalate (Carrots and cauliflower)	58	58.0	20	20.0	18	18.0	4	4.0
Citrus fruits (lemon, oranges)	14	14.0	4	4.0	58	58.0	24	24.0
High fiber diet (whole grains)	58	58.0	11	11.0	15	15.0	16	16.0

Permitted food	No.	%
≥ 70 % Better consumption of permitted food	8	8.0
<70% Poor consumption of permitted food	92	92.0
Mean ± SD	13.0±4.01	

Table (5): Frequency and Percentage Distribution of restricted foods consumption to assess the nutritional status among Patients with Nephrolithiasis

Restricted food	Never		Monthly		Weekly		Daily	
	No	%	No	%	No	%	No	%
Canned foods (salmon, soups, and vegetables	25	25.0	15	15.0	18	18.0	42	42.0
High salt foods (added to meals)	22	22.0	5	5.0	18	18.0	55	55.0
Fast food and snakes (chips and crackers)	31	31.0	14	14.0	25	25.0	30	30.0
Animal proteins (red meat)	3	3.0	39	39.0	50	50.0	8	8.0
Food rich in oxalate (spinach, nuts, and chocolate)	15	15.0	17	17.0	54	54.0	14	14.0
Sweeteners (sweet potato)	4	4.0	10	10.0	48	48.0	38	38.0
Caffeinated drinks (tea and coffee)	3	3.0	3	3.0	19	19.0	75	75.0
Soft drinks (soda)	29	29.0	11	11.0	37	37.0	23	23.0
Calcium supplements	64	64.0	4	4.0	2	2.0	30	30.0

Restricted food	No.	%
<70% Better consumption of restricted food	73	73.0
≥ 70 %Poor consumption of restricted food	27	27.0
Mean ± SD	16.05±4.49	

Table (6): Frequency and Percentage Distribution of Malnutrition screening to assess the nutritional status among Patients with Nephrolithiasis (n=100).

Malnutrition Universal screening Tool(MUST)	No.	%
The patient body mass index		
BMI>20: Score	85	85.0
BMI18.5-20: Score	13	13.0
BMI<18.5: score	2	2.0
Weight loss in the past 3-6 months		
<5%	39	39.0
5-10%	46	46.0
10%	15	15.0
Feel acutely sick right now		
Yes	57	57.0
No	43	43.0
Intake of food been poor for the last 5 days		
Yes	83	83.0
No	17	17.0
low risks for malnutrition (0)	7	7.0
Medium risk (1)	23	23.0
High risks for malnutrition (>1)	70	70.0
Mean ± SD	2.33±1.27	

Table (7): Relation between Total Malnutrition Screening and demographic Characteristic among Studied Patients **(N=100)**

Demographic data	Total Malnutrition Screening						χ²	P-Value
	Low risk		Medium risk		High risk			
	No.	%	No.	%	No.	%		
Age (year)							2.376	0.331
<50	3	3.0	12	12.0	46	46.0		
>-50	4	4.0	11	11.0	24	24.0		
Gender							9.069	0.007[*]
Male	4	4.0	9	9.0	52	52.0		
Female	3	3.0	14	14.0	18	18.0		
Occupation							5.335	0.067
Working	4	4.0	10	10.0	49	49.0		
Not working	3	3.0	13	13.0	21	21.0		
Monthly income							1.254	0.552
Sufficient	3	3.0	5	5.0	18	18.0		
Insufficient	4	4.0	18	18.0	52	52.0		
Educational Level							4.392	0.096
Educated	3	3.0	15	15.0	54	54.0		
Illiterate	4	4.0	8	8.0	16	16.0		
Marital status							2.335	0.362
Single	2	2.0	9	9.0	16	16.0		
Married	5	5.0	14	14.0	54	54.0		
Place of residence							2.378	0.364
Urban	1	1.0	10	10.0	31	31.0		
Rural	6	6.0	13	13.0	39	39.0		

Discussion

Among demographic characteristics of the studied patients the present study, shows that three fifths (61.0%) of the studied patients their ages less than 50 years with Mean± SD (44.29±10.70).The finding of the present study in the same context with **(Degheili et al.,2022)** who reported in the study about "Epidemiology and composition of nephrolithiasis in a Lebanese tertiary care center" that more than half of the studied patients their ages less than 50 years with mean age was 46.58±16.5 years.

According to the present analysis, about two thirds of the studied patients (65.0%) were males. In agreement with **(Hanan et al., 2022),** in the study about "Prevalence of Kidney Stone Diseases in Benghazi; Libya." showed that, more than two thirds of the patients were males. This finding is supported by **(Singh et al., 2023),** in the study about "Risk factors of incident kidney stones in Indian adults: a hospital-based cross-sectional study." who reported that, more than two thirds of patients were male. In contrast **(Tundo et al., 2018),** in the study about "Gender Equivalence in the Prevalence of Nephrolithiasis among Adults Younger than 50 Years in the United" stated that, about half of the patients were female .

The current analysis found that shows that more than two- third of the studied patients had insufficient monthly income. This result can be explained by limited access to health care , delayed diagnosis , inadequate treatment and poor dietary habits such as higher consumption of processed or salty food. In the same context with **(Khan et al., 2022)** in the study entitled "risk Factors of Nephrolithiasis in a

Tertiary Care Hospital in Rawalpindi: A Descriptive Cross-Sectional Study" who stated that about two third of the studied population have lower socioeconomic status. In contrast **(Zahirian et al, 2022),** in the study about "Kidney stones among Iranian adults: Prevalence and socioeconomic inequality assessment in a cohort-based cross-sectional study" stated that, he probability of kidney stones among the richest group was about 1.5 times higher than the poorest group, as the reference group .

  Regarding family history of nephrolithiasis, the results of the present study showed that more than three fifth of the patients had previous family history of kidney stones. These findings were in agreement with **Mahmud et al., (2024),** in the study entitled "Assessment of risk factors for nephrolithiasis in Rawat, founded that, more than half of the studied patients have family history of nephrolithiasis. This finding is in contrast with **Safdar et al ., (2021)),** in the study entitled "the prevalence of renal stones among local residents in Saudi Arabia." who reported that about only one third of the studied patient have family history of kidney stones among first degree relatives

  Concerning Current health history, types of stone formed, the present study revealed that about two third of the studied patients have calcium oxalate stone**.** This is may be due to calcium oxalate has poor solubility compared to other salts. The present finding is supported by **Seiner et al., (2022)**, in his study about "Urinary stone composition in Germany: Results from 45,783 stone analyses" stated that, more than two third of the studied patients have calcium oxalate stones .this is supported by, **Singh et al., (2015),** in a study about "Stone Composition Among First-Time Symptomatic Kidney Stone Formers in the Community." showed that, about three quarter of the studied patients had calcium oxalate stones.

  The current analysis found that, about three quarter of the studied patients had unsatisfactory total knowledge level regarding nephrolithiasis. In the same context with **(Amin et al., 2022),** who reported in the study entitled "Management of Kidney Stone Patients." that, two fifths of the studied patients had poor total knowledge about kidney stone. This is supported by**(Baatiah et al.,2020)** , who reported in the study entitled" Urolithiasis: Prevalence, risk factors, and public awareness regarding dietary and lifestyle habits in Jeddah, Saudi Arabia in 2017" that about two third of the studied population have low awareness level**.**

  Concerning consumption of permitted food , the present study revealed that, about three fifth of the studied patient had consume permitted animal proteins**,** more than two fifth never attain dairy calcium rich foods and about three fifth never had high fiber diet(whole grains). In the same context with **(Amaar et al ., 2023**), who reported that, about three quarter of the studied patient consume permitted animal protein weekly about half don't take enough dietary calcium and about three fifth never eat whole grains.

  Regarding consumption of restricted food, the present study revealed that, more than half of study subjects had eating salty foods daily, more than half had food rich in oxalate weekly, and half of patients eaten animal proteins (red meat) weekly .this is in the same line with **Mahmoud et al., (2019)** who reported that about two fifth of the studied patients consume salty food daily majority consume food rich in oxalate weekly Regarding the and the majority consumed red meat weekly.

  The present study revealed that, about two third of the studied patient had high risk for malnutrition .This is in the same context with **(Lee et al., 2021)** who reported in the study entitled "Nutritional status assessed by the Controlling Nutritional Status (CONUT) score as a predictor of recurrence of urolithiasis". That more than half of the studied patients had poor nutrition COUNT score>-2. This is

in contrast with **(Jackson, et al 2019)** who reported in the study entitled "A new renal inpatient nutrition screening tool (Renal iNUT) " that only one fifth of the studied patients at increased malnutrition risk using MUST scale . Also **(Leandro-Merhi et al ., 2015)** who reported in the study entitled "Which patients surgically treated for urolithiasis need nutritional care? " that only tenth of the kidney stone patients undergone percutaneous nephron lithotripsy at nutritional risk according to nutritional risk screening scale.

Conclusion

Based on the current study's findings, it can be said that around three-quarters of the patients under investigation knew insufficiently about nephrolithiasis overall. The majority of the patients in the study did not exercise proper self-care. Over two-thirds of the patients in the study were at high risk of malnutrition.

Recommendations

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- Conduct regular health educational sessions to Raise awareness about the importance of self -care practices among patients with nephrolithiasis.
- Implement routine screening for malnutrition among patient with recurrent kidney stones, especially those experiencing unintentional weight loss and poor appetite.
- Develop multidisciplinary care teams including nephrologist dietitians and primary care providers to deliver comprehensive care plans tailored to each patient's medical and nutritional status
- Replicate the study across different health care settings and geographic regions to validate and generalize the results for nephrolithiasis patients**.**

Author's contributions

R.M.A; Conceived and designed the study, developed the research tools, conducted data collection, and contributed significantly to data interpretation and manuscript writing. M.A.M; Supervised all stages of the study, revised multiple drafts critically for intellectual content. H.K.Z; Provided the first draft of the manuscript before its publication, participated in all the steps of research. N.M.T; Conducted the overall supervision of the manuscript before its publication and approved the final version for publication. All authors reviewed and approved the final manuscript and take full responsibility for the integrity of the work.

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