A Study to Assess the Factors Influencing the Re-Occurrence of Renal Calculi Among Patients Attending the Urology OPD At NMCH, Jamuhar, Bihar.

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***Abstract*—Background of the Study Renal calculi (kidney stones) are a common urological disorder characterized by the formation of crystalline deposits within the kidneys. The condition is associated with a high recurrence rate and poses a significant health burden worldwide. Factors such as inadequate fluid intake, excessive salt consumption, high oxalate diet, recurrent urinary tract infections, metabolic abnormalities, and environmental influences contribute to the recurrence of renal calculi. Recurrent episodes result in repeated hospital admissions, increased healthcare expenditure, loss of productivity, and diminished quality of life. Identifying the factors responsible for recurrence is essential for planning preventive strategies and improving patient outcomes.**

Methodology A quantitative research approach with a descriptive cross-sectional research design was adopted for the study. The study was conducted in the Urology Outpatient Department of Narayan Medical College and Hospital (NMCH), Jamuhar, Bihar. A total of 30 patients with a history of renal calculi were selected using a non-probability purposive sampling technique. Data were collected through a structured questionnaire designed to assess factors influencing the recurrence of renal calculi. The collected data were analyzed using descriptive statistics such as frequency, percentage, mean, and standard deviation, and inferential statistics including Chi-square test and t-test. Results The findings revealed that 80% of the participants had experienced recurrence of renal calculi. Major risk factors identified were low fluid intake (56.7%), high salt intake (73.3%), high oxalate diet (63.3%), and recurrent urinary tract infection (76.7%). The majority of participants were males (66.7%) and belonged to rural areas (83.3%). Most respondents (60%) had moderate to high-risk scores for recurrence. A statistically significant association was found between recurrence of renal calculi and factors such as water intake, dietary habits, and selected socio-demographic variables ($p < 0.05$). Aim of the Study The aim of the study was to assess the factors influencing the re-occurrence of renal calculi among patients attending the Urology OPD at NMCH, Jamuhar, Bihar.

Recommendations The study recommends providing health education regarding adequate fluid intake, dietary modifications including reduction of salt and oxalate-rich foods, regular follow-up and screening of high-risk individuals, and awareness programs targeting rural populations. Further studies with larger sample sizes and broader settings are also recommended.

Conclusion The study concluded that recurrence of renal calculi is highly prevalent among patients attending the Urology OPD and is significantly influenced by modifiable factors such as fluid intake, dietary habits, lifestyle practices, and environmental conditions. Early identification of risk factors and implementation of preventive measures can effectively reduce recurrence rates and improve the overall quality of life of affected individuals.

***Index Terms*—Renal Calculi, Kidney Stones, Recurrence, Risk Factors, Fluid Intake, Dietary Habits, Urology OPD.**

I. INTRODUCTION

Renal calculi, commonly known as kidney stones, are hard deposits formed in the kidneys due to the accumulation of minerals and salts in urine. It is one of the most common disorders of the urinary system and can cause severe pain, urinary obstruction, hematuria, and recurrent infections. Despite advances

in treatment, recurrence remains a major health concern.[1]

The prevalence of kidney stones has increased worldwide over the last few decades. In developed countries, the condition affects approximately 11% of men and 7% of women. Factors such as dehydration, obesity, climate change, and diets high in salt and animal protein have contributed to this rise. Countries with hot and dry climates report higher rates of stone disease.[2]

India falls within the Afro-Asian Stone Belt, where urinary stone disease is highly prevalent. Approximately 12% of the Indian population is affected by renal calculi, with a higher prevalence in Northern India. The condition is most common among adults aged 30–50 years and occurs more frequently in males than females.[3]

Bihar is considered a high-risk area for renal calculi due to high temperatures, dehydration, and dietary habits. In Rohtas district and surrounding regions, consumption of oxalate-rich foods and mineral-rich water may increase the risk of stone formation and recurrence.[4]

Renal calculi often recur even after successful treatment. Studies indicate that recurrence occurs in about 10% of patients within one year, 35% within five years, and nearly 50% within ten years. Recurrent stones frequently require repeated hospital visits and surgical interventions, increasing the physical and financial burden on patients.[5]

Several factors such as inadequate fluid intake, dietary habits, urinary tract infections, obesity, and lifestyle practices contribute to the recurrence of renal calculi. Assessing these factors among patients attending the Urology OPD at NMCH, Jamuhar, Bihar, will help in developing effective preventive measures, health education programs, and nursing interventions to reduce recurrence and improve patient outcomes.[6]

II. NEED OF THE STUDY

Renal calculi are a common urological disorder with a high tendency to recur. Studies indicate that the recurrence rate of kidney stones is approximately 10–15% within one year, 35–40% within five years, and nearly 50% within ten years if appropriate preventive measures are not followed. Therefore, renal calculi should be considered a chronic condition requiring long-term management rather than a one-time illness.[7]

The recurrence of renal calculi imposes a significant economic burden on patients and their families. The costs associated with diagnostic investigations, medications, hospital visits, and surgical procedures such as PCNL, URSL, and ESWL can be substantial. In addition, recurrent stone episodes often result in loss of workdays and reduced productivity, particularly among rural populations who depend on daily wages and farming for their livelihood.[8]

Although several studies have identified factors such as inadequate fluid intake, unhealthy dietary habits, urinary tract infections, obesity, and metabolic disorders as contributors to stone recurrence, there is limited evidence available from the Rohtas region of Bihar. Local environmental conditions, dietary patterns, and lifestyle practices may influence recurrence differently in this population. Hence, region-specific data are needed to understand the factors responsible for recurrent renal calculi among patients attending NMCH, Jamuhar.[9]

The findings of this study will be beneficial for healthcare professionals, especially nurses, in planning effective patient education and preventive strategies. Identification of modifiable risk factors can help develop targeted interventions related to hydration, diet modification, and lifestyle changes. The study will also assist the urology department in identifying high-risk patients and implementing appropriate follow-up care.[10]

Therefore, the present study is undertaken to assess the factors influencing the re-occurrence of renal calculi among patients attending the Urology OPD at NMCH, Jamuhar, Bihar, with the aim of reducing recurrence, improving quality of life, and promoting cost-effective preventive care.[11]

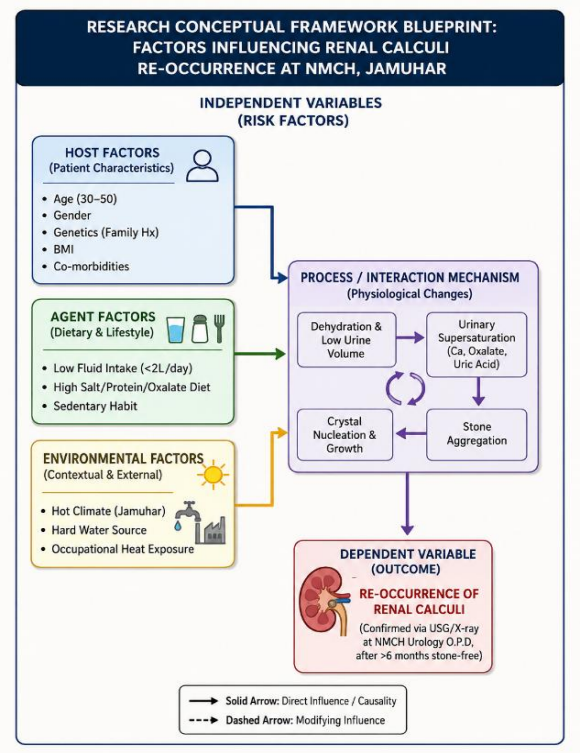
OBJECTIVES

1. To assess the factors influencing re- occurrence of renal calculi among patient attend urology OPD, NMCH, Jamuhar.
2. To associate the factors influceing re - occurrence of renal calculi with their socio demographical variables among patient attending Urology OPD at NMCH, Jamuhar Bihar.

HYPOTHESIS

RH_1: There is a significant association between medical and urological history and the recurrence of renal calculi.

RH_2: There is a significant association between dietary factors and the recurrence of renal calculi.
RH_3: There is a significant association between lifestyle/environmental factors and the recurrence of renal calculi.
RH_4: There is a significant association between overall risk score and the recurrence of renal calculi.
RH_5: There is a significant association between demographic variables and the recurrence of renal calculi.



Conceptual Framework

III. METHODOLOGY

RESEARCH APPROACH

A quantitative research approach was adopted for the present study to assess the factors influencing the re-occurrence of renal calculi among patients attending the Urology Outpatient Department (OPD) at Narayan Medical College and Hospital (NMCH), Jamuhar, Bihar.

RESEARCH DESIGN

The design of this study was descriptive cross-sectional. The design was suitable for evaluation of factors related with the recurrence of renal calculi in a cross-sectional manner without any manipulation of the research variables.

RESEARCH SETTING

The study was conducted in the Outpatient Department (OPD) of Narayan Medical College and Hospital (NMCH), Jamuhar, Bihar.

RESEARCH VARIABLES

Independent Variable
Independent Variables
Factors influencing the recurrence of renal calculi, including:

- Demographic factors (age, gender, education, occupation, family history)
- Medical and urological factors (history of renal calculi, urinary tract infection, comorbidities, previous treatment)
- Dietary factors (daily fluid intake, salt intake, oxalate-rich food consumption, dietary practices)
- Lifestyle and environmental factors (physical activity, climate exposure, smoking, alcohol consumption, BMI, urinary habits)

Dependent Variable

- Re-occurrence of renal calculi among patients attending the Urology OPD.

IV. POPULATION AND SAMPLE

The target population comprised all adult patients diagnosed with renal calculi attending the Urology OPD at NMCH, Jamuhar, Bihar. The accessible population consisted of patients diagnosed with renal calculi who attended the Urology OPD during the period of data collection and fulfilled the eligibility criteria.

SAMPLING TECHNIQUE

A non-probability purposive sampling technique was employed to select participants who met the predefined inclusion criteria.

INCLUSION CRITERIA

Patients aged 30–50 years.
Male and female patients diagnosed with renal calculi.
Patients attending the Urology OPD at NMCH, Jamuhar.
Patients willing to participate and provide informed consent.

EXCLUSION CRITERIA
Critically ill patients.
Patients with congenital renal abnormalities.
Patients unable to communicate effectively.
Patients unwilling to participate in the study.

V. DATA COLLECTION PROCEDURE

Formal permission for data collection was acquired from the appropriate authorities of Narayan Medical College and Hospital (NMCH), Jamuhar, Bihar before data collection. The participants who visited Urology OPD and met the inclusion criteria were identified. The goal and objectives of the study were described to each participant and written informed consent was obtained prior to their participation. All information was guaranteed to be secret and used only for research reasons, and participants were informed of this. Data were obtained by face-to-face interview with the use of structured questionnaire. Each interview took about 20-25 minutes to finish. The filled questionnaires were checked daily for completeness, accuracy and consistency of the data collected.

PLAN FOR DATA ANALYSIS
The collected data were coded, tabulated, and analyzed using appropriate statistical methods. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to summarize the demographic characteristics and study variables. Inferential statistics were applied to determine the association between recurrence of renal calculi and selected risk factors. The Chi-square test was used to assess the association between categorical variables, while the independent t-test was used to compare mean risk scores where applicable. A p-value of less than 0.05 was considered statistically significant.

VI. DATA ANALYSIS

Data analysis is the process of organizing, summarizing, and interpreting data to draw meaningful conclusions. The data collected from 30 patients attending the Urology OPD at NMCH, Jamuhar, Bihar, were analyzed using descriptive and inferential statistics.
Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to describe the study variables. Inferential statistics such as Chi-square test and independent t-test were used to determine associations and compare risk scores. Statistical significance was considered at $p < 0.05$.

The data were organized under the following sections:
Section I:
Frequency and percentage distribution of socio-demographic variables.

Table 4.1: Frequency and Percentage Distribution of Socio-Demographic Variables Among Patients with Renal Calculi (N = 30)

S. No	Demographic Variables	Frequency (f)	Percentage (%)
1	Age (Years)		
	30–40	18	60.0
	41–50	12	40.0
2	Gender		
	Male	20	66.7
	Female	10	33.3
3	Religion		
	Hindu	25	83.3
	Muslim	4	13.3
	Others	1	3.4
4	Educational Status		
	Illiterate/Primary	15	50.0
	Secondary & above	15	50.0
5	Occupation		
	Agriculture/Labour	22	73.3
	Business/Employed	6	20.0
	Homemaker	2	6.7
6	Residence		
	Rural	25	83.3
	Urban	5	16.7
7	Monthly Family Income (₹)		
	≤10,000	18	60.0
	10,001–20,000	10	33.3
	>20,000	2	6.7

Section II:
Distribution of medical and urological history among patients.

Section III:
Distribution of dietary factors influencing recurrence of renal calculi.

Section IV:
Distribution of lifestyle and environmental factors influencing recurrence.

Section V:
Assessment of recurrence status and overall risk scores.

Section VI:
Association between factors influencing recurrence and selected socio-demographic variables using Chi-square test.

Section VII:
Comparison of mean risk scores between recurrent and non-recurrent patients using independent t-test.

VII. RESULT

The study was conducted among 30 patients attending the Urology OPD at NMCH, Jamuhar, Bihar, to assess the factors influencing the re-occurrence of renal calculi.

The socio-demographic findings revealed that the majority of participants 18 (60%) belonged to the age group of 30–40 years, 20 (66.7%) were males, and 25 (83.3%) were from rural areas. Most participants 22 (73.3%) were engaged in agriculture or labor work, and 18 (60%) had a monthly family income of ₹10,000 or less.

Regarding medical and urological history, a large proportion of participants had a previous history of renal calculi and recurrent urinary tract infections. Family history of renal calculi and previous hospitalization due to stone disease were also reported among several participants.

Assessment of dietary factors showed that low fluid intake, high salt consumption, and frequent intake of oxalate-rich foods were common among the participants. More than half of the respondents consumed less than 2 liters of water per day, while a majority reported regular consumption of salty and high-oxalate foods.

With respect to lifestyle and environmental factors, most participants were exposed to hot climatic conditions, excessive sweating, inadequate physical activity, and delayed urination habits, all of which may contribute to stone recurrence.

The study found that 24 (80%) participants had experienced recurrence of renal calculi, while only 6 (20%) reported no recurrence. Based on the overall risk score, the majority of participants were classified under moderate to high-risk categories.

Statistical analysis revealed significant associations between recurrence of renal calculi and selected factors such as water intake, dietary habits, recurrent urinary tract infection, family history, and selected socio-demographic variables ($p < 0.05$). The comparison of mean risk scores also showed significantly higher scores among patients with recurrent renal calculi than those without recurrence.

The findings indicate that recurrence of renal calculi is strongly associated with modifiable risk factors, particularly inadequate fluid intake, dietary practices, urinary tract infections, and lifestyle behaviors.

Interpretation:
The chart shows that the majority of patients 18 (60%) had a moderate risk level for recurrence of renal calculi, whereas 6 (20%) patients each belonged to the low-risk and high-risk categories. This indicates that most participants possessed multiple risk factors associated with recurrent renal calculi.

For your thesis in Word, you can manually place the values 20%, 60%, and 20% above the bars after inserting the chart. This is the standard format commonly used in nursing dissertations.

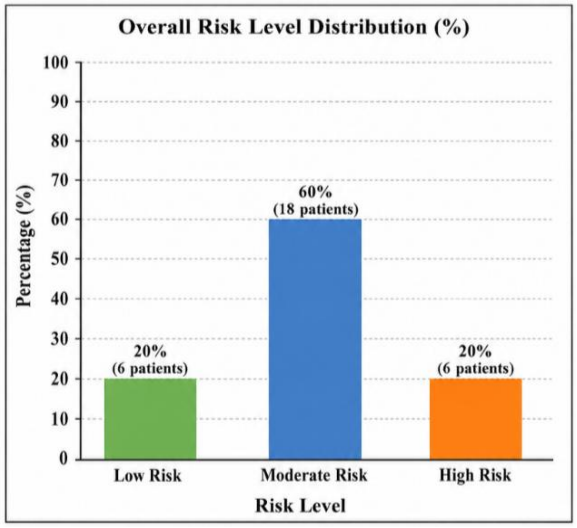


Figure 4.5: Distribution of Overall Risk Levels Among Patients (N=30)

SUMMARY OF DATA ANALYSIS

The present study was conducted among 30 patients attending the Urology OPD at NMCH, Jamuhar, Bihar, to assess the factors influencing the re-occurrence of renal calculi. A quantitative descriptive cross-sectional design was adopted, and data were collected using a structured questionnaire.

The findings revealed that the majority of participants were males (66.7%), aged 30–40 years (60%), and from rural areas (83.3%). The study identified low fluid intake, high salt intake, oxalate-rich diet, recurrent urinary tract infections, and exposure to hot climatic conditions as major factors influencing recurrence. About 80% of participants had experienced recurrence of renal calculi, and most were categorized as having moderate to high risk. Significant associations were found between recurrence and selected dietary, lifestyle, medical, and socio-demographic variables.

The study concludes that recurrence of renal calculi is highly prevalent and largely influenced by modifiable risk factors. Appropriate preventive measures and health education can help reduce recurrence and improve patient outcomes.

VIII. DISCUSSION

The present study found that recurrence of renal calculi was common among patients attending the Urology OPD. The majority of recurrent cases were males and belonged to the age group of 30–40 years. Low fluid intake, high salt consumption, oxalate-rich foods, recurrent urinary tract infections, and hot environmental conditions were identified as important risk factors.

The findings support previous studies which reported that inadequate hydration and unhealthy dietary habits increase the risk of recurrent stone formation. Exposure to hot climates and excessive sweating may further contribute to dehydration and stone recurrence. Significant associations between recurrence and selected risk factors indicate that many of these factors are preventable through lifestyle modification and patient education.

Therefore, early identification of risk factors and implementation of preventive strategies are essential to reduce the recurrence of renal calculi and improve quality of life among affected patients.

IX. NURSING IMPLICATIONS

Nursing Practice

Nurses play a vital role in preventing recurrence of renal calculi through patient education and counseling. They should educate patients regarding adequate fluid intake, dietary modifications, medication adherence, and regular follow-up care. Nurses should also encourage healthy lifestyle practices and early reporting of urinary symptoms.

Nursing Education

The findings of the study can be utilized in nursing education programs to enhance students' knowledge regarding risk factors, prevention, and management of recurrent renal calculi. Educational materials and awareness programs can be developed based on the identified risk factors.

Nursing Administration

Nursing administrators can organize health education programs, screening camps, and awareness activities focusing on prevention of renal calculi. Standardized patient education protocols may be developed to improve the quality of care provided to high-risk patients.

Nursing Research

The findings provide a foundation for future research on preventive interventions, lifestyle modification programs, and patient education strategies related to renal calculi recurrence. Similar studies with larger sample sizes and different settings are recommended to strengthen the evidence base.

Community Nursing

Community health nurses can conduct awareness campaigns regarding adequate hydration, healthy dietary practices, and prevention of urinary tract infections. Early identification of high-risk individuals in the community may help reduce recurrence and improve overall kidney health.

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