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Awareness of Kidney Stone among Adults in a Ward of Changunarayan Municipality

Rabita Thayaju[1], Sujita Sigdel[2]*, Shrijana Kayastha[3]

[1]Bhaktapur Hospital, Bhaktapur, rabitathuyaju111@gmail.com,
[2]Department of Adult Health, TU IOM Pokhara Nursing Campus, sujisgd@gmail.com
[3]Department of Adult Health, TU IOM Pokhara Nursing Campus, cayasth@gmail.com
***Corresponding Author:** Sujita Sigdel, sujisgd@gmail.com

ABSTRACT

Introduction: Kidney stones are a common urological problem worldwide. It is a common problem seen in all ages, sexes, and races, but occurs more frequently in men than in women between the ages of 20–49 years. This study aimed to evaluate the level of awareness of kidney stone among adults in Changunarayan Municipality.

Methods: Descriptive cross sectional research design was used among 144 adults selected purposively from Changunarayan Municipality ward-3, Bhaktapur. A Self-developed structured interview questionnaire was used for data collection. The collected data were entered in statistical Package for the Social Sciences. The results were analyzed by using descriptive statistics, i.e., frequency, percentage, mean and standard deviation. Chi-square test was used to measure the associations between levels of awareness among adults with selected background variables.

Results: Among 144 respondents, 42.4 % were from the age group 20-29 years with a mean age of 33.77± SD 8.26. Only 10.4 % had a previous history of kidney stones. Regarding the symptoms of kidney stones, 68.1% reported a strong desire to urinate. A total of 43.1% had inadequate awareness. There was no significant association between age, sex, education status, occupation, previous medical history, health problems and family history.

Conclusion: This study revealed that nearly half of the adults had inadequate awareness. There was no statistically significant association between the level of awareness and selected background information. However, an awareness program focused on prevention could be conducted to increase the level of knowledge and reduce the incidence of kidney stone formation.

Keywords: Adults, Awareness, Kidney Stone

INTRODUCTION

One of the most common urologic problems is a kidney stone. Approximately 12 % of people worldwide experience kidney stones at the same point in their lifetime[1]. Kidney stones are a highly prevalent disease worldwide, with rates ranging from 7 to 13% in North America, 5-9 % in Europe, and 1-5% in Asia. Due to high rates of new and recurrent kidney stones, management of stones is expensive, and the disease has a high level of acute and chronic morbidity. [2]

It affects all ages, sexes, and races, but occurs more frequently in men than in women within the age range of 20–49 years.[3]The age group between 20-30 years with a male predominance has the highest prevalence of kidney stone.[4] The incidence of kidney stones reaches its peak in the population aged over 30 years. [5]Individuals who experienced kidney stone often have a 50 % recurrence rate in the first five years.[6]

Higher incidence and prevalence rates are also observed in affluent developed countries than poorer developing nations, which may be due to differences in diet, with wealthier populations eating higher levels of salt, protein, calcium and purines.[7] In developing countries, kidney stone disease is perceived as uncommon; however, the global prevalence of this

disease has increased over the past two decades due to lifestyle changes. [3]

Multiple risk factors may contribute to the development of kidney stones, such as age, sex, ethnicity, a hot climate, eating habits, physical activity and occupation. Co-morbidities such as diabetes, high blood pressure and obesity are other major factors. [8]The chance of having kidney stones is 1.17 times greater in diabetic individuals, 1.43 times greater in hypertensive individuals, 2.21 times greater in individuals with fatty liver, and 1.35 times greater in overweight individuals. [9]

owing to its high prevalence in adults of working age, kidney stone disease has a substantial impact on the individuals and society, and has become a public health issue, particularly in populations residing in regions with a hot and dry climate.[10]

In Saudi Arabia, a high percentage of positive family history was observed among renal stone patients (34.9%), which could be attributed to high rates of consanguinity. The recurrence rate among Saudis is as high as 50%. [11]

In Nepal, due to a lack of centralized epidemiological data, the prevalence and incidence of kidney stones are not yet known. Few studies have been conducted in this tittle in Nepal. Many risk factors and background information variables contribute to kidney stones. In many countries, even in developing and developed countries, there is still a lack of awareness of kidney stone among the general population. Therefore, researchers were interested in assessing awareness of kidney stone among the adults in a ward of Changunarayan Municipality, Bhaktapur.

METHODOLOGY

A descriptive cross-sectional research design was used to assess the awareness of kidney stones among adults in a community. 144 adults aged 20-49 years were selected via the non-probability purposive sampling technique, calculating the sample size from the previous study. Ethical approval for the study was obtained from the IRC Tribhuwan University Institute of Medicine (Ref no: 656 080/081). Then, a request letter for permission to collect the data for the study setting was obtained from Tribhuvan University, Institute of Medicine, Pokhara Nursing Campus. Then formal permission was taken for data collection from the concerned authorities of Changunarayan municipality ward no. 3, Bhaktapur. The Data was collected through a structured interview schedule. Face-to-face interviews were conducted by the researcher herself at their convenience. The time duration for each respondent was 20 - 25 minutes. A total of 20 to 25 respondents were interviewed each day.

The purpose of the study was explained to the respondents, and informed consent was obtained from all respondents. Privacy was maintained by conducting the interviews separately. Confidentiality was maintained by not disclosing the collected information to others. Data were collected within two weeks' period from 2023/12/17 to 2023/12/30

After the data were collected, checking and compiling were performed manually on the same day of data collection. The collected data were coded and entered into statistical package for social science software (SPSS) for further analysis. Descriptive statistics such as the mean, frequency, and percentage were used to analyze the background information and inferential statistics such as chi square test were used to determine the association between background variables and level of awareness. The study findings are presented in the form of a table. Level of awareness was calculated as per the mean score obtained from the total score and categorized as inadequate awareness (below the mean score) and adequate awareness (equal to or above the mean score).

The Validity of the instrument was maintained by an extensive review of literature and consultation with the research advisor, and corrections from expertise. Simple and understandable language was used in the questionnaire to obtain response from the respondents and direct leading questions were avoided. The questionnaire was developed in English and translated into Nepali language. The research tool was sent to experts for content validity, and their feedback was incorporated into the study.

Pretesting of the instrument was performed in 10% of the total sample size (i.e., 14) in ward no 2 Changunarayan municipality, before the instrument was finalized to identify the accuracy, adequacy

and completeness. After the pre-test, required modifications were made.

The reliability of the tool was measured via Cronbach's α test to measure internal consistency, which was 0.79.

RESULTS

Table 1 shows that 42.4 % of the adults were between 20 and 29 years of age. The majority of adults (79.2%) were Janajati, and 70.8 % were female. Similarly, 32.6% of adults had secondary level education, and 32.6 percent were homemakers. Only 10.4% of the adults had a previous history of kidney stones, and 25% of the adults had a family history. Similarly, most of the adults (86.8%) had no other illness.

Table 2 shows that most adults (84.7%) reported that a stone occurred in the kidney. With respect to the cause of kidney stones, the majority (77.8%) of the adults reported holding their urine for a long period of time. With respect to dietary patterns that increase the risk of kidney stones, most (84.0%) of the adults reported excessive consumption of red meat. Similarly, 35.4 % of adults responded as increase in environmental temperature poses risk to the formation of kidney stones.

Table 3 shows that 68.1% of adults reported that symptoms of kidney stones were strongly desired to urinate. Regarding the location of pain in kidney stones, the majority (78.5%) of adults reported severe pain on the side and back, i.e. below the ribs. Similarly, 56.9 % reported that a foul smell in urine occurs in kidney stones.

With respect to treatment, most adults (83.3%) and (81.1%) reported that kidney stone were treated through surgery and lithotripsy, respectively. Almost all of the adults (93.1%) reported the recurrence of kidney stones. Similarly, as preventive measures, almost (97.2%) of all adults responded that drinking more water can prevent kidney stone formation. The majority (76.4%) of the adults stated that dietary modification is needed for kidney stones. Almost all of the adults (97.9%) and (93.1%) who responded that untreated stone can lead to kidney failure and infection, respectively (Table 4).

Table 5 reveals that out of 144 adults, more than half (56.9%) have an adequate level of awareness.

Table 1: Background Information of Adults **n=144**

Background Information	Number	Percent
Age (in completed years)		
20 to 29 years	61	42.4
30 to 39 years	35	24.3
40 to 49 years	48	33.3
Mean age±S.D (33.77±8.265)		
Ethnicity		
Janajati	114	79.1
Chettri	22	15.3
Brahmin	4	2.8
Dalit	4	2.8
Sex		
Male	42	29.2
Female	102	70.8
Education status		
No formal education	16	11.1
Basic level (1-8)	41	28.5
Secondary level (9-12)	47	32.6
Higher level (bachelor and above)	40	27.8
Occupation status		
Homemaker	47	32.6
Agriculture	34	23.6
Services	21	14.6
Business	20	13.9
Labor	12	8.4

Student	10	6.9
Previous history of kidney stone		
Yes	15	10.4
No	129	89.6
Any other Illness		
Hypertension	8	5.6
Diabetes mellitus	5	3.5
Urinary tract infection	2	1.4
Gout	2	1.4
Heart related disease	2	1.4
No any illness	125	86.7
Family history of kidney stone		
Yes	36	25.0
No	108	75.0

Table 2: Awareness of Risk Factors, Causes and Site of Kidney Stones in Adults **n=144**

Correct Responses	Number	Percent
Risk factor for stone in the urinary tract *		
Lack of exercise	77	53.5
Prolonged sitting without movement	36	25.0
Sleeping on one side without changing position	27	18.8
Prolonged immobility in bed in case of fractures and heart diseases	21	14.6
Dietary patterns that increase the risk of kidney stone *		
Excessive consumption of red meat	121	84.0
Excessive consumption of beans	34	23.6
Excessive consumption of calcium-containing food/supplementation	39	27.1
Excessive salt consumption increases the risk of kidney stone	72	50.0
High calcium and uric acid in the blood increase the formation of kidney stone	68	47.2
Increase temperature poses risk to the formation of kidney stone	51	35.4
Causes of kidney stone *		
Hold urine for long time	112	77.8
Sedentary lifestyle	73	50.7
Urinary tract infection	63	43.8
Family history	28	19.4
Site of formation of kidney stone *		
Kidney	122	84.7
Ureter	119	82.6
Urinary bladder	73	50.7

**multiple responses*

Table 3: Awareness of Symptoms on Kidney Stones of Adults **n=144**

Correct Responses	Number	Percent
Symptoms of kidney stone *		
Strong desire to urinate	98	68.1
Pass a small amount of urine	90	62.5
Increase the frequency of urinate	80	55.6
Fever and chills	37	25.7
Nausea and vomiting	36	25.0
Location of pain in kidney stone *		
Severe pain in the side and back, below the ribs	113	78.5

Pain that radiates to the lower abdomen and groin	79	54.9
Pain during urinating	64	44.4
Foul smell urine odor occurs in kidney stone	82	56.9

**Multiple response*

Table 4: Awareness of the Treatment, Prevention and Complications of Kidney Stones in Adults, n=144

Correct Responses	Number	Percent
Treatment of kidney stone *		
Through surgery	120	83.3
Lithotripsy	117	81.3
Through medicine	113	78.3
Kidney stone can reoccur	134	93.1
Medicine only cannot treat kidney stone	107	74.3
Drinking more water can prevent kidney stone formation	140	97.2
Dietary modification is needed in kidney stone	110	76.4
Dietary modification is needed in kidney stone if yes *		
Decrease protein intake	77	53.5
Limit salt intake	75	52.1
Limit calcium consumption/supplementation	39	27.1
Stone can damage kidney	142	98.6
Untreated stone can lead to kidney failure	141	97.9
Untreated stone can lead infection	134	93.1

**Multiple response*

Table 5: Level of Awareness of Kidney Stones among Adults, n=144

Level of awareness	Number	Percent
Adequate	82	56.9
Inadequate	62	43.1
Mean ± S.D (22.72±6.18)		

DISCUSSION

This study assessed the level of awareness among the adult population in Changunarayan Municipality Ward No. 3. This study revealed that, out of 144 adults, more than half (56.9%) had adequate awareness. Most of the adults were females aged between 20 and 29 years and had a formal education. Only (10.4%) of the adults had a previous history of kidney stones. Only (25%) of the respondents had a family history that was supported (44.1%) by the study. [1]

Regarding the site of kidney stone, the majority (84.7%) of respondents reported the kidney, 82.6% reported the ureter which is supported by study conducted in United Arab Emirates. [12]

In the present study, most of the adults (84.0%) reported that excessive consumption of red meat, whereas only (6.3%) reported that excessive consumption of fruits increased the risk of kidney stone. A total of 50.0 % adults identified that excessive salt consumption increases the risk of kidney stone. These findings were consistent with those of a study conducted in Albha city where the prevalence was (72.0%)[13]. Similarly, 47.2% of the participants reported that high calcium and uric acid levels in blood can increase the formation of kidney stone, which is nearly similar (46.9%). Only (35.4%) of adults reported that increased environmental temperature poses a risk to the formation of kidney stone. Another study conducted in Jeddah, Saudi Arabia reported positive findings (48%)[14].

In the present study, most (77.8%) of the adults are reported as holding urine for a long time due to kidney disease, and 50.7 % reported having a sedentary

lifestyle. A total of 43.8% responded as urinary tract infection. Our result is supported by another study conducted in the United Arab Emirates and Riyadh, Saudi Arabia where the finding was 56.1% & 54.5%, respectively and only (19.4%) reported as family history as a cause of kidney stone which is similar to study conducted in Jeddah, Saudi Arabia where 20% of the respondent had a family history of kidney stone[14].

In terms of symptoms of kidney stones, the majority (68.1%) of adults reported a strong desire to urinate, which is similar to the findings of a previous study (67.5%).[15] The majority (62.5%) of adults reported that a small amount of urine was passed through, which is similar to previous findings (62.0% & 65.0%). Similarly, 55.6% of adults reported an increased frequency of urinating, which is dissimilar (10.0%) to the findings of a previous study [13.] Only 25.7% and 25.0% of the respondents reported fever and chills, which is supported (17.5%) by nausea and vomiting, respectively. [15]

In the present study, most of the adults (78.5%) reported severe pain on the side and back, below the ribs as the location of pain in kidney stone was similar (76.6% & 74.0%) to that reported in previous study .[15] Similarly, 54.9% of the participants reported pain that radiated to the lower abdomen and groin this finding is dissimilar (18.0%) to that reported in the study. [13] A total of 44.4% reported pain while urinating as a location of pain in kidney stones. Similarly,56.9%of the participants correctly responded that a foul smell odor occurs in a kidney stone, which is similar to the percentage (55.8%) reported in the previous study. [15]

Almost all of the adults (97.2%) correctly reported that drinking more water can prevent kidney stones, which is nearly similar (94.0%) to studies conducted by Almuhanna AM and other on Saudi Arabia[13]. Most of the adults (76.4%) reported that dietary modification is needed for kidney stone. Our result accords with the study of Alahsa, Saudi Arabia.[16]

In this study, the majority of adults agreed that the treatment of kidney stone through surgery was 83.3%. Almost all adults 97.9 % reported that untreated stones can lead to kidney failure. On the other hand, our study suggested that there is no association between family history of kidney stone and level of awareness. In the analysis, we found that there was no significant association between education and level of awareness. This is in accordance with the study conducted Bisha Population, Saudi Arabia. [1]

In the present study, out of 144 adults, 42.3% had inadequate awareness, which is similar to the findings of a study conducted in Jeddah, Saudi Arabia, where 33.7% had inadequate awareness [14] A similar study conducted in the United Arab Emirates showed that 56.3% had a poor level of knowledge[17] which is higher than that reported in our study. There was no significant association between age, sex, education status, occupation, previous medical history, health problems, and family history. This finding is similar to that of the previous study, which revealed that there was no significant association between age, sex, education status, or previous history. [13] Similarly, there is no association between family history and health problems. [1]

CONCLUSION

This study revealed that nearly half of the adults had inadequate awareness. There was no statistically significant association between the level of awareness and selected background information. However, an awareness program focused on prevention could be conducted to increase the level of knowledge and reduce the incidence of kidney stone formation. Further studies are needed to assess awareness of kidney stones and associated factors

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