

## Original Research Article

# Knowledge regarding renal stone among the nurses working in a selected specialized hospital in Bangladesh

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**Received:** 08 April 2019

**Accepted:** 17 May 2019

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## ABSTRACT

**Background:** Renal stone disease is a considerable burden on public health worldwide. This study aimed to assess the nurse's knowledge regarding renal stone among the nurses working at a selected specialized hospital.

**Methods:** A total of 120 samples were collected through purposive sampling technique. A descriptive cross-sectional study was conducted under quantitative approach. Data were collected using a structured questionnaire through face to face interview. A written informed consent was obtained from the hospital authority and nurses. Data were analysed using SPSS version 20.

**Results:** In this study ninety percent of the respondents were female and about 43.3% of the respondents were in the age group 31-35 years. About 35.8% of the respondents had postgraduate qualification and the majority (63.3%) of the respondents had 4 years and above years of service experience. More than nine-tenths (95.8%) of the respondents mentioned that renal stone is one kind of urological disease and 75.8% of the respondents mentioned that calcium oxalate is responsible elements for formation of renal stone. About 63.3% of them mentioned pain or burning during urination as the symptoms of renal stone. 66.7% of the respondents mentioned that a patient with renal stone should be counseled on stone-specific dietary interventions.

**Conclusions:** The findings reveal that most of the study participants had good level of knowledge regarding the renal stone. It was recommended that a special training on renal stone for nurses might be geared up to increase their level of knowledge.

**Keywords:** Knowledge, Nurses, Renal stone, Respondents, Disease

## INTRODUCTION

Renal stone disease is a crystal concretion formed usually within the kidneys. It is an increasing urological disorder of human health, affecting about 12% of the world population and it has also been associated with an increased risk of end-stage renal failure.<sup>1</sup> Renal stones form when compounds in the urine aggregate into a solid

mass.<sup>2</sup> Renal stones form in the kidneys as a result of precipitation of urinary constituents and may develop in one or both of the kidneys. The lifetime risk of urinary stone disease is 12% in males and 6% in females and the prevalence of the condition is increasing, resulting in approximately 12,000 hospital admissions every year.<sup>3</sup> Renal stone disease is a considerable burden on public health worldwide.<sup>4,5</sup> Kidney stones can cause extreme pain and urinary blockage in severe cases.<sup>6,7</sup>

Very small stones can pass through the entire urinary tract without causing symptoms, but larger stones can become lodged in the kidneys, ureters, bladder, or urethra.<sup>8,9</sup> Renal stones are frequently passed without complications, using only conservative treatment such as pain relief and hydration.<sup>10,11</sup>

Renal stones increase the risk of chronic kidney disease and end-stage renal disease, independently of risk factors shared by stone formers and those with chronic kidney disease such as high blood pressure and diabetes.<sup>12</sup> It is estimated that the risk of chronic kidney disease is twice as high in stone formers compared with non-stone formers.<sup>13</sup>

Renal stone is one of the most vulnerable diseases in the renal system. One person of every 20 people suffers from this disease in Bangladesh. Renal stone is the high risk for male after 40 years, and female are after 50 years. However, in any time of the age of people can suffer renal stone and whose are suffered renal stone in more times, they may suffer renal stone again and again.<sup>14</sup> In Bangladesh, 20 million peoples are suffering from renal diseases. In this type of disease 5 people are died in early age. At present renal stone accounts for about 1 in every 10 patients in worldwide and 63% people die by non-communicable disease.<sup>14</sup>

Lack of knowledge about renal stone, the nurse would not be able to provide the appropriate care to the patients; as a result, there was increased risk of chronic kidney disease. In this situation, the patients suffered and they couldn't take their treatment properly. The management of renal stones largely depends on medical and surgical procedures (according to patients need) and nurses duties are pre and postoperative management of renal stone. If the nurses have proper knowledge about the management of renal stone patients, they would be able to perform their responsibilities efficiently. Therefore, it was important to know the level of nurse's knowledge regarding renal stone. The senior staff nurses working at National Institute of Kidney Diseases and Urology might had not sufficient knowledge about renal stone.

## METHODS

A descriptive type of quantitative study was conducted to assess the level of nurse's knowledge regarding renal stone. This study was carried out in "National Institute of Kidney Diseases and Urology, Dhaka Bangladesh for a period of 6 months (June to November, 2018). The study population was all the nurses working at National Institute of Kidney Diseases and Urology.

A purposive sampling technique was used to recruit the study participants. A total of 120 nurses were selected by considering exclusion and inclusion criteria. All registered nurses who had 2-4 years working experience were included and nurses who were sick or unavailable were excluded.

Data were collected using self-administered structured questionnaire and the structured questionnaires were prepared in English in the light of specific objectives. The pilot study was done on four nurses from "Kidney Foundation Hospital and Research Institute" to ensure validity and reliability of the instrument. Necessary correction and modification was made after reviewing by the experts and the research instrument was finalized on the basis of the pre-test. The data were coded numerically and entered into statistical software (SPSS version 20) for analysis.

## Ethical consideration

A formal permission was taken from the authority of Grameen Caledonian College of Nursing and Director of hospital authority. The study purposes were explained to the nurses and then a written consent was taken from the nurses. Confidentiality was assured there would be no risk associated with the study. The identities of the respondents were coded in order to keep confidentiality and anonymity.

## RESULTS

### Socio-demographic characteristics of the respondents

Table 1 showed that ninety percent of the respondents were female and the rest of them were male. About 43.3% of the respondents were in the age group 31-35 years and 86.7% of the respondents were married. Regarding the religion about 76.7% of the study participants were Muslims, followed by Hindu (20%) and the remaining were Christina 93.3%). About 35.8% of the respondents had postgraduate level of education, followed by who had diploma in nursing (30%), B.Sc. in nursing (17.5%) and 16.7% had post basic qualification. The majority (63.3%) of the respondents had 4 years and above years of service experience and the rest had less than 4 years' service experience (36.7%).

### Knowledge about causes of renal stone

Table 2 showed that more than nine-tenths (95.8%) of the respondents mentioned that renal stone is one kind of urological disease and 75.8% of the respondents mentioned that calcium oxalate is responsible elements for formation of renal stone, followed by 5% who mentioned potassium, sodium (3.3%) and 2.5% mentioned carbon as the responsible element for formation of renal stone. Ninety percent of the respondents mentioned that the prevalence of renal stone is increasing globally. About 63.3% of the respondents mentioned that low intake of fluid is the causes of renal stone and 36.7% mentioned that family history is the cause of renal stone and 20% of them mentioned that infections are the causes of renal stone. About 60% of the respondents mentioned that *E. coli* is the responsible bacterium for renal stone, followed by *Proteus mirabilis* (46.7%), *Treponema pallidum* (6.7%) and the rest mentioned *helicobacter pylori* (3.3%).

**Table 1: Socio-demographic characteristics of the respondents (n=120).**

Characteristics	Frequency	Percentage (%)
<b>Gender</b>		
Male	12	10.0
Female	108	90.0
<b>Age (years)</b>		
≤30	36	30.0
31-35	52	43.3
36 & above	32	26.7
<b>Marital status</b>		
Married	104	86.7
Single	16	13.3
<b>Religion</b>		
Muslim	92	76.7
Hindu	24	20.0
Christian	4	3.3
<b>Professional qualification</b>		
Diploma in nursing	36	30.0
B.Sc. in nursing	21	17.5
Post basic	20	16.7
Postgraduate	43	35.8
<b>Working experience</b>		
≤3 years	44	36.7
≥4 years	76	63.3

**Table 2: Knowledge about causes of renal stone (n=120).**

Items	Frequency	Percentage (%)
<b>Renal stone is one kind of urological disease</b>		
Yes	115	95.8
No	5	4.2
<b>Responsible elements for formation of renal stone</b>		
Calcium oxalate	91	75.8
Carbon	3	2.5
Sodium	4	3.3
Potassium	6	5.0
None of them	16	13.3
<b>Prevalence of renal stone globally</b>		
Increasing	108	90.0
Decreasing	12	10.0
<b>Causes of renal stone (multiple response)</b>		
Low intake of fluid	76	63.3
Exercise too or little	16	13.3
Infections	24	20.0
Family history	44	36.7
All of them	36	30.0
<b>Responsible bacterium for renal stone (multiple response)</b>		
<i>Proteus mirabilis</i>	56	46.7
<i>E. coli.</i>	72	60.0
<i>Treponema pallidum</i>	8	6.7
<i>Helicobacter pylori</i>	4	3.3
None of them	32	26.7

**Knowledge about symptoms of renal stone**

Table 3 showed that about 76.7% of the respondents, mentioned that Pain in the back, belly, or side is the symptoms of renal stone and 63.3% of them mentioned Pain or burning during urination as the symptoms of renal stone. More than three-fifths (67.5%) of the respondents mentioned "urgent need to go" as the symptoms of renal stone and 43.3% also mentioned blood in the urine as the symptom of renal stone. More than half (55.8%) of the respondent mentioned cloudy or smelly urine as the symptoms of renal stone and 35% of them mentioned "Going a small amount at a time" as the symptom of renal stone. Half of the respondents stated that nausea and vomiting are the symptoms of renal stone and 17.5% of the respondents mentioned fever and chills as the symptoms of renal stone.

**Table 3: Knowledge about Symptoms of Renal Stone (n=120)**

Items	Yes N (%)	No N (%)
<b>Pain in the back, belly, or side</b>	92 (76.7)	28 (23.3)
<b>Pain or burning during urination</b>	76 (63.3)	44 (36.7)
<b>Urgent need to go</b>	81 (67.5)	39 (32.5)
<b>Blood in the urine</b>	52 (43.3)	68 (56.7)
<b>Cloudy or smelly urine</b>	67 (55.8)	53 (44.2)
<b>Going a small amount at a time</b>	42 (35.0)	78 (65.0)
<b>Nausea and vomiting</b>	60 (50.0)	60 (50.0)
<b>Fever and chills</b>	21 (17.5)	99 (82.5)

**Knowledge about prevention and management of renal stone**

Table 4 showed that about 66.7% of the respondents mentioned that a patient with renal stone should be counseled on stone-specific dietary interventions and 55.8% of the respondents mentioned that a patient with renal stone should be assessed for risk of chronic kidney disease. About 76.7% of the respondents mentioned that to prevent renal stones, medication use should be evaluated and modified as needed and 59.2% of them stated that a patients with renal stone should increase fluid intake to at least 2 L per 24 hours. Little above three-tenths (35.8%) of the respondents mentioned that renal stone type should be identified when possible, even on initial stone occurrence and 49.2% of them stated that urine characteristics should be obtained in patients with renal stones to guide treatment and prevention. About 48.3% mentioned that patients should avoid calcium supplements unless their health care provider approves and 32.5% of them stated that decreasing animal protein and oxalate intake is recommended. About 35% of them mentioned that completely eliminating oxalate-containing foods is unnecessary. (E.g. chocolate, coffee, strawberries and tea).

**Table 4: Knowledge about prevention and management of renal stone (n=120).**

Items	Yes N (%)	No N (%)
<b>A patient with renal stone should be counseled on stone-specific dietary interventions</b>	80 (66.7)	40 (33.3)
<b>A patient with renal stone should be assessed for risk of chronic kidney disease</b>	67(55.8)	53 (44.2)
<b>To prevent renal stones, medication use should be evaluated and modified as needed</b>	92 (76.7)	28 (23.3)
<b>A patients with renal stone should increase fluid intake to at least 2 L per 24 hours</b>	71 (59.2)	49 (40.8)
<b>Renal stone type should be identified when possible, even on initial stone occurrence</b>	43 (35.8)	77 (64.2)
<b>Urine characteristics should be obtained in patients with renal stones to guide treatment and prevention</b>	59 (49.2)	61 (50.8)
<b>Patients should avoid calcium supplements unless their health care provider approves</b>	58 (48.3)	62 (51.7)
<b>Decreasing animal protein and oxalate intake is recommended</b>	39 (32.5)	81 (67.5)
<b>Completely eliminating oxalate-containing foods is unnecessary. (e.g. chocolate, coffee, strawberries and tea)</b>	42 (35.0)	78 (65.0)

### Overall knowledge level about renal stone

Figure 1 showed that most of the respondents (31.0%) had good level of knowledge regarding the renal stone and 29.0% of them had very good level of knowledge. About 16.7% of the respondents had average level of knowledge regarding the renal stone and 13.3% of the study participants had poor level of knowledge regarding the renal stone. However only 10% had excellent level of knowledge about the renal stone.

## DISCUSSION

In this study more than nine-tenths (95.8%) of the respondents mentioned that renal stone is one kind of urological disease and ninety percent of the respondents mentioned that the prevalence of renal stone is increasing globally. A study reported that a renal stone is an important health problem in the world and is the most common disease in urinary tract system.<sup>15</sup>

A study reported that the symptoms of kidney stone are related to their location whether it is in the kidney, ureter, or urinary bladder.<sup>16</sup> About 76.7% of the respondents, mentioned that Pain in the back, belly, or side is the symptoms of renal stone and 63.3% of them mentioned Pain or burning during urination as the symptoms of renal stone. More than half (55.8%) of the respondent mentioned cloudy or smelly urine as the symptoms of renal stone and half of the respondents stated that nausea and vomiting are the symptoms of renal stone. A Study reported that some conditions may result in nausea and vomiting with associated suffering from the stone event.<sup>17</sup>

More than six-tenths of the respondents mentioned that a patient with renal stone should be counseled on stone-specific dietary interventions. A study reported that a different environments and diets contribute variably to the incidence and composition of urinary stones.<sup>18,19</sup>

Most of the respondents (31.0%) had good level of knowledge regarding the renal stone and 29.0% of them

had very good level of knowledge. This is inconsistent with the finding of another study from India which reported that 10.42% of the respondents had good level of knowledge regarding the renal stone.<sup>20</sup> In this study also 16.7% of the respondents had average level of knowledge regarding the renal stone and 13.3% of the study participants had poor level of knowledge regarding the renal stone. However only 10% had excellent level of knowledge about the renal stone. Another similar study reported that about 89.58% of the study participants had average level of knowledge regarding the renal stone.<sup>20</sup>

## CONCLUSION

Based on the findings of the current study, it can be concluded that most of the study participants (31.0%) had good level of knowledge regarding the renal stone and 13.3% of the study participants had poor level of knowledge regarding the renal stone. However only 10% had excellent level of knowledge about the renal stone. It was recommended that a special training on renal stone for nurses might be geared up to increase their level of knowledge. A further study should be necessary because there was limited information regarding the nurse's knowledge about the renal stone.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

## REFERENCES

1. Alelign T, Petros B. Kidney Stone Disease: An Update on Current Concepts. *Advances in Urology*. 2018;(2018):3068365.
2. Aggarwal KP, Narula S, Kakkar M, Tandon C. Nephrolithiasis: molecular mechanism of renal stone formation and the critical role played by modulators. *Biomed Res Int*. 2013;2013:292953.
3. Cunningham P, Noble H, Al-Modhefer A.K, Walsh I. Kidney stones: pathophysiology, diagnosis and management. *Br J Nurs*. 2016;25(20):1112-6.

4. Koeppen BM. The kidney and acid-base regulation. *Adv Physiol Educ*. 2009;33(4):275-81.
5. Lewis JL. MSD Manual Professional Version. Acid-Base Regulation: 2013. Available from: <https://www.msmanuals.com/professional/endocrine-and-metabolic-disorders/acid-base-regulation-and-disorders/acid-base-regulation>. Accessed on 3 May 2019.
6. University of Maryland Medical Center (UMMC). Health Information: Medical Reference Guide: Kidney Stones: 2015 Available at <http://umm.edu/health/medical/reports/articles/kidney-stones>. Accessed on 3 May 2019.
7. Singh KJ, Kaur J. Comparison of three different endoscopic techniques in management of bladder calculi. *Indian journal of urology: IJU: journal of the Urological Society of India*; 2011;27(1):10-3.
8. National Library of Medicine (NLM). Kidney Stones (Renal Calculi): 2015. Available from: <http://www.ncbi.nlm.nih.gov/pubmedhealth/PMHT0022762/>. Accessed on 3 May 2019.
9. Johns Hopkins Health Library. Kidney Stones. 2015: Available from: [http://www.hopkins-medicine.org/healthlibrary/conditions/kidney\\_and\\_urinary\\_system\\_disorders/kidney\\_stones\\_85,P01494/](http://www.hopkins-medicine.org/healthlibrary/conditions/kidney_and_urinary_system_disorders/kidney_stones_85,P01494/) Accessed on 3 May 2019.
10. Aliotta P.J, Alvero R. Ferri's Clinical Advisor. Urolithiasis (Nephrolithiasis): 2015 Available from: [www.clinicalkey.com](http://www.clinicalkey.com). Accessed on 3 May 2019.
11. Antonelli J, Maalouf N. ePocrates. Nephrolithiasis: 2015. Available from: <https://online.epocrates.com/>. Accessed on 3 May 2019.
12. Frassetto L, Kohlstadt I. Treatment and prevention of kidney stones: an update. *Am Family Physician*. 2011;84(11):1234-42.
13. Keddis MT, Rule AD. Nephrolithiasis and loss of kidney function. *Current Opinion Nephrol Hypertension*. 2013;22(4):390-6.
14. Samad MA. More than twenty million people are suffering from kidney diseases in Bangladesh. *Kaler Kantho*: 2017: Available at: <http://www.kalerkantho.com/online/national/2017/02/26/468266>. Accessed on 3 May 2019.
15. Khan AS, Rai ME, Gandapur, Pervaiz A, Shah AH, Hussain AA, et al. Epidemiological risk factors and composition of urinary stones in Riyadh Saudi Arabia. *J Ayub Med Coll Abbottabad*. 2004;16(3):56-8.
16. Kumar SB, Kumar KG, Srinivasa V, Bilal S. A review on urolithiasis. *Int J Universal Pharmacy Life Sci*. 2012;2(2):269–80.
17. Teichman JM, Joel MH. Acute renal colic from ureteral calculus. *N Eng J Med*. 2004;350(7):684–93.
18. Alkhunaizi AM. Urinary stones in Eastern Saudi Arabia: *Urol Ann*. 2016;8(1): 6–9.
19. Chan SW, Ng CF, Man CW, Chung R, Li SK. A report on a randomly sampled questionnaire survey about renal stone disease in Hong Kong. *Hong Kong Med J*, 2008;14(6):427–31.
20. Shanthi S, Shambhavi, Souza V. Assess the knowledge of Renal Calculi among Patients Admitted in Urology Ward at Selected Hospital in Madurai with a View to Prepare a Pamphlet. *Int J Nur Edu Res*. 2014;2(4):294-6.

**Cite this article as:** Halim KMA, Sultana S, Khatun R, Islam S, Muhammad F. Knowledge regarding renal stone among the nurses working in a selected specialized hospital in Bangladesh. *Int J Community Med Public Health* 2019;6:2768-72.