

## Public Awareness towards Renal Stone Causes, Symptoms and Management amongst Saudis

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### ABSTRACT

**Introduction:** renal stone is an important health problem in the world and is the most common disease in urinary tract system. It is particularly a common problem in areas of hot climate like Saudi Arabia. Knowledge and lifestyle attitude of individuals towards renal stone plays a role in delivering optimum management.

**Aim:** to determine the public awareness of renal stones causes, symptoms and management amongst Saudis.

**Patients and Methods:** the data of this quantitative cross-sectional study was collected from participants from two regions in Saudi Arabia. Participants were given a self-administered questionnaire written in Arabic from October 2017 till November 2017. Individuals under the age of 18, tourists, medical staff and people unable to read Arabic were excluded. Data were analyzed using SPSS.

**Results:** four hundred and seven participants with a mean age of 35 filled the questionnaire. About half of them had experienced renal stones either personally or in a direct family member. 91.4% of them are aware that increased water intake decreases the formation of renal stones. As for symptoms of urinary stones, 65.36% of them thought that pain and other urinary symptoms would occur when having urinary stones. Radiology imaging was the most chosen mode of diagnosing urinary tract stones especially amongst participants above the age of 35 (p-value= 0.002) with surgical intervention as the best treatment according to the participants. 57.2% of the participants believe that drinking parsley water prevents the formation of renal stones. Individuals who experienced renal stones before were more knowledgeable about the commonest type of renal stones (p-value= 0.005) and the quantity of recommended daily fluid intake (p-value= 0.008).

**Conclusion and Recommendation:** this data indicates that the participants are to some degree aware of some aspects of renal stone prevention, symptoms and modes of diagnosis and treatment. Individuals who experienced renal stones were more knowledgeable in some aspects. Further emphasis on public awareness of renal stones is recommended.

**Keywords:** Kidney diseases, renal stones, public awareness, urinary tract system.

### INTRODUCTION

Renal stone is an important health problem in the world and is the most common disease in urinary tract system. In addition to that, urinary tract stones are common worldwide healthcare problem with high prevalence (20%) in Saudi Arabia. Also, renal stones are more common in men than women with ratio (3.2:1) and most of the cases are idiopathic with ratio (4:1) stones in men reaching the age of 60 is over 20%<sup>(1)</sup>.

The treatment of urinary tract stones has dramatically changed over the last 20 years. Today, the vast majority of stone pass spontaneously with conservative management while the rest of stone can be treated effectively with minimal surgical intervention such as shock wave lithotripsy (SWL) and endourological techniques. However, a major problem is the high recurrence rate even after surgery or SWL<sup>(2)</sup>. Implementing new methods to

increase community's awareness and screening to detect the early renal stone would be a contributing factor to decrease the number of cases. Furthermore, increased awareness of symptoms, causes, and management methods will help in decreasing the number of morbidities and stop disease progression. The aim of this study is to determine the public awareness of renal stone causes, symptoms, screening and management in Al-Riyadh and Al-Hassa cities in Saudi Arabia.

### PATIENTS AND METHODS

#### Study Design and Setting

This is a quantitative cross-sectional study which focused on determining the public knowledge and awareness towards renal stone in Al-Riyadh and Al-Hassa cities in Saudi Arabia. Data have been collected from Saudis with the age group of 18 years and above both male and female who lives in Riyadh

and Al-Hassa regions by using a self-administered questionnaire from October 2017 till November 2017.

### Sampling Method

The target population was waiting patients and visitors present at the waiting area of the primary care outpatient clinics of King Khaled University Hospital in Al Riyadh city and King Fahad Hospital in Al-Hassa region. Exclusion criteria were: who less than 18 years old, who couldn't read Arabic, the tourists and medical staffs. Participants were consecutively selected and asked to fill out a questionnaire.

### Tool of Data Collection

A self-administered questionnaire written in Arabic was given to the participants. Along with the questionnaire was a consent form. The questionnaire included closed ended multiple choice questions related to the following:

1. Demographic data of the participant (Gender, age, education level and employment).
2. Knowledge about renal stones.
3. Knowledge towards renal stones prevention.
4. Knowledge about renal stones management.

### Statistical Analysis

The data have been analyzed by using the Statistical Package for Social Science (SPSS) version 22.0) with a p-value <0.5 was considered statistically significant.

### Ethical Concerns

The Authors report no conflict of interest in the conduction of this study. **The study was done after approval of ethical board of King Saud university.**

## RESULTS

Data was collected from 407 participants. 44% of them had family members who experienced kidney stones in the past. While 9.6% of the participants have experienced kidney stones themselves. 91.4% of the participants think that increasing fluid intakes prevents the formation of urinary stones and 41.3% of the participants consume 1-1.5 L of water per day. Table 1 displays proportions of participants regarding the formation of urinary stones.

**Table 1:** Demographic data of the participants.

	Number (407)	%
Age ( Mean±SD)	33.03±12.20	
Educational level		
None	4	0.98
Primary school	10	2.46
Intermediate school	14	3.44
High school	91	22.36
Undergraduate	258	63.39
Postgraduate	30	7.37
Experienced kidney ureter bladder stone	39	9.6
Any member of family experienced kidney stone	179	44.0

Increased fluid intake and boiled parsley got the top two preventive measures against urinary stones, while sedentary life style and urinary tract infections were seen as the top two promoters of urinary stones. Most of the participants were unsure if red meat, coffee, tea, chocolate, disorders of parathyroid gland and gout increase the possibility of forming urinary tract stones. The response of the patients was recorded and presented in **Table 2**.

**Table 2: Response to Knowledge Items regarding the formation of urinary stones**

Knowledge Items	Affirmative responses	
	Number	%
Fluid intake prevents urinary stones.	372	91.4
Urinary tract infections increase the likelihood of urinary stones formation.	222	54.5
Sedentary life style increases the likelihood of urinary stone formation.	207	50.9
High calcium and uric acid in the blood increases the likelihood of stone formation.	191	46.9
Red meat increases the likelihood of stone formation.	145	35.6
Coffee and tea contribute to the formation of stones.	92	22.6
Endocrine diseases increase the likelihood of stone formation.	121	29.7
Family history of urinary stones increases one's likelihood to develop urinary stones.	94	23.1
Boiled parsley water can prevent the formation of stones.	233	57.2

Furthermore, Half of the participants (50.9%) associated obesity with the development of urinary stones.

On the other hand, about half of them did not see a family history of urinary tract stones as a risk factor. Participants were going more with calcium component stones as the most common types of urinary stones. Amongst the urinary stones symptoms, pain was the most selected with a percentage of 16.95%. Moreover,

65.36% though that pain is associated with other symptoms (Table 3).

Radiology imaging was the most chosen mode of diagnosing urinary tract stones especially amongst participants above the age of 35 (p-value 0.002) with surgical intervention as the best treatment according to the participants. As a home remedy, 57.2 % thought that boiling parsley can prevent and treat urinary stones as shown in Table 3.

**Table 3:** Response to knowledge, attitude and management of urinary stones

	Number	%
Experienced kidney ureter bladder stone	39	9.6
Any member of family experienced kidney stone	179	44.0
Most common type of kidney stones		
calcium component	173	42.5
uric acid	146	35.9
ammonium phosphate	88	21.6
Amount of fluid you approximately take daily		
less than 4 glasses	91	22.4
4-6 glasses	168	41.3
6-8 glasses	104	25.6
8-10 glasses	22	5.4
more than 12 glasses	22	5.4
The best amount of fluid should be taken in a day		
less than 1 liter	2	.5
1 to 2 liters	193	47.4
2 to 3 liters	194	47.7
I don't know	18	4.4
Do you know what could be the complications of leaving stones and not treating them early?		
obstructions of urinary tract and kidney failure	382	93.9
no complications	10	2.5
getting diabetes	8	2.0
heart stroke	7	1.7
What could be used to know if kidney stones are existing?		
radiology imaging	235	57.7
urine analysis	98	24.1
blood workup	20	4.9
taking sample from the kidney	8	2.0
fecal analysis	4	1.0
I don't know	42	10.3
What could be the best treatment for kidney stones?		
drinking parsley water	106	26.0
drinking milk daily	3	.7
diuretics medication	63	15.5
surgical intervention	235	57.7
Have you encountered an awareness campaigns of kidney stones in public places or malls or even gardens in the Kingdom of Saudi Arabia?		
yes	41	10.1
no	366	89.9

## DISCUSSION

Urolithiasis is one of the hallmark urological problems that affect both sexes. It is considered to be a multifactorial problem that is influenced by genetic predisposition, race, age, sex, diet, weather and body weight<sup>(3,4,5,6)</sup>. Relevantly, it was found that metabolic syndrome, a common disorder amongst Saudis, is a key factor in the development of urinary stones<sup>(7,8,9)</sup>. This disorder has financial and lifestyle consequences. Determining the knowledge and attitude of the community on this disorder, its prevention and management helps in targeting aspects that could decrease its incidence.

Different environments and diets contribute variably to the incidence and composition of urinary stones<sup>(1,10,11)</sup>. In Saudi Arabia it is expected that with the inadequate water intake and the high temperatures of the region that urinary stones would be high.<sup>(1)</sup> Indeed, there was study done in the western region of Saudi Arabia that show an increase presentation of stone colic pain to the Emergency Room (ER) during the hot months of June, July and August<sup>(12)</sup>.

The association between body weight and metabolic syndrome which was mentioned earlier may be the cause behind some cases of urinary stones in Saudi Arabia. This is particularly relevant in Saudi Arabia with one study reporting an alarming metabolic syndrome prevalence of 28.3%<sup>(13)</sup>.

Increased urinary acid excretion maybe the cause behind this increase incidence amongst this group<sup>(9,14)</sup>. A study calculated an incidence rate of 111/100000 of urinary stones in Eastern Saudi Arabia with the majority of the patients having metabolic abnormalities<sup>(10)</sup>. Of interest, half of the participants in this study associated obesity with the development of urinary stones which could indicate an increasing awareness of the morbidities associated with obesity.

Although there are numerous literature published regarding the attitude of physician in care providing to patients suspected to have urinary stones<sup>(15,16,17)</sup>, very few publications addressed the knowledge and attitude of non-health care individuals in this regard<sup>(18)</sup>.

In this study, participants had positive attitudes towards preventing renal stones with 91.4% of them agreeing that increasing fluid intake prevents the formation of renal stones. However, the majority thought that the controversial home remedy

of boiling parsley would prevent and cure urinary stones while they were mostly unsure about the other dietary factors.

A study within Saudi Arabia Shows that urologists' knowledge of stone recurrence preventive programs is suboptimal. They do not apply effectively the best stone prevention practice guidelines in their daily practice as well. Efforts to increase knowledge and enforce its application in daily practice are strongly warranted<sup>(17)</sup>.

Amongst the participants of this study 44% of them had family members that experienced urinary stones and 9.6% had urinary stones themselves and this demonstrates how common this condition in this region.

Although this study attempted to measure some aspects of knowledge and attitude towards urinary stones, it is limited by the lack of a comprehensive inquiry of preexisting medical conditions and a detailed inquiry of fluid intake. A detailed inquiry of how the community incorporates behaviors that prevent urinary stones is worth investigating. A larger study incorporating these points is recommended. Moreover, the lack of knowledge in some areas that were demonstrated in this study importune the need for public health interventions that seek to spread awareness and knowledge of this problem, particularly its association with metabolic syndrome.

## CONCLUSION AND RECOMMENDATION

Participants responded variably to different aspects of knowledge and attitude towards urinary stones. This data indicates that the participants are to some degree aware of some aspects of renal stone prevention, symptoms and modes of diagnosis and treatment. Individuals who experienced renal stones were more knowledgeable in some aspects. A public health intervention aiming at correcting misconceptions and enhancing preventive measures in recommended.

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