









ORIGINAL ARTICLE

Perception and attitude of medical and paramedical students of Umm Al-Qura University regarding urolithiasis: a cross-sectional study

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ABSTRACT

Background: Urolithiasis encompasses a common emergent problem that needs medical and surgical intervention. Therefore, our study focuses on determining the level of attitude concerning urolithiasis among medical and paramedics students at Umm Al-Qura University.

Methods: An electronic survey was distributed among participants online in June 2022. We utilized convenient sampling methods to stratify students according to their college. After data collection, appropriate statistical analysis was performed using Statistical Package for Social Studies.

Results: This study enrolled a total of 360 students from the department of medicine and paramedics at Umm Al-Qura University. The mean age was 22.2 (SD, 1.66). Most kidney stones generally show excellent and positive attitudes among students except for the incurability of kidney stones, which demonstrated a negative attitude. Furthermore, a significant association was found between the importance of calcium intake and stones analysis in preventing kidney stones and students' departments (p -value, 0.007 and 0.003, respectively).

Conclusion: Detecting kidney stones is vitally crucial in minimizing their recurrence risk. Our finding indicates a negative attitude toward the curability of kidney stones. Thus, education and awareness programs should be employed in health-related departments to maximize the benefit.

Keywords: Urolithiasis, kidney stones, attitude, perception, students, Saudi Arabia.

Introduction

The production of urinary calculi in the urinary system is identified as urolithiasis [1-2]. Although the overall likelihood of producing stones varies worldwide, it is a global public health concern [1,3]. For example, renal calculi are approximately 2.5 times more frequent in Saudis than non-Saudis employed in Saudi Arabia, according to epidemiological research conducted in Riyadh in 2001 [1,4]. One's lifestyle influences stone formation. In a study published in 2004, Siener et al. [5] found that overweight and obese people have a higher risk of acquiring idiopathic calcium oxalate residues in

the kidney, which can lead to renal stone development

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[1]. Furthermore, bad dietary habits such as high salt/high protein diets and fasting for extended periods may contribute to developing renal stones [1,6]. Several researchers have also explored the link between water intake and kidney stone formation since hydration is thought to be a primary predictor of stone formation [1,6]. Renal stone patients are frequently asymptomatic [7,8]. Hematuria, dysuria, loin pain, urinary tract blockage, and urinary tract infection all indicate renal stones [7,8]. Other possible symptoms are restlessness, sweating, pallor, and vomiting [7,8]. Renal stones can be treated medically or surgically. The treatment option depends on the patient, the kind and size of the renal stone, and its location. Oral stone dissolving, extracorporeal shock wave lithotripsy, ureteroscopy, percutaneous nephrolithotomy, and open or laparoscopic lithotomy are all treatment alternatives [7,9]. Healthcare providers' knowledge, attitudes, and practices are essential factors in treatment delays. As a result, it is vital to evaluate future healthcare providers' knowledge, attitudes, and practices regarding urinary tract stones before developing healthcare education programs [10].

Subjects and Methods

This comparative university-centered cross-sectional electronic survey was carried out at Umm Al-Qura University in June 2022. The Umm Al-Qura University ethics committee granted ethical approval. This survey followed the principles of the Declaration of Helsinki. Our study's inclusion criteria were undergraduate medical and paramedic students and interns (female and male) in their second, third, fourth, fifth, and sixth years. Students from other health faculties were excluded. A convenience sampling technique was used to stratify

students by department. The sample size was computed using the Stat Calc of Open Epi software of the Rollin School of Public Health, Emory University, USA [11], reflecting a confidence interval of 95% and a 5% margin of error; the minimum sample size was 303. However, our final dataset comprised 360 samples. In June 2022, we distributed a structured self-report survey using online social media platforms. Students were asked to provide their agreement to continue the study. Additionally, the research team answered all inquiries and questions from participants. The survey contained two sections. We first gathered participants' demographical profiles. Then, the second part examined participants' attitudes toward urolithiasis based on [10]. The recorded data were entered into Microsoft Excel to check their compactness and correct typographical mistakes. Then, they were transferred to a Statistical Package for the Social Studies v.23 spreadsheets (IBM, Armonk, NY). The mean and SD for the continuous variables were used in the descriptive analysis, and a *p*-value of less than or equal to 0.05 was regarded as significant. Categorical variables were expressed as percentages. An independent chi-square test was used to compute the categorical variables.

Results

We interviewed students from the Department of Medicine and Paramedics via an online survey. A total of 360 students were enrolled in this survey. Their demographical profiles are shown in Table 1. The students' age mean was 22.2 (SD = 1.66). Most students' age groups ranged from 22 to 24-year-old (*n* = 235, 65.3%). Male participants demonstrated the most responses (*n* = 326, 90.6%). Students from 6th-year have the highest responding rate representing (*n* = 129,

Table 1. Demographic data.

| Variable | Category | N | (%) |
|---------------|------------------|-----|------|
| Age groups | 19-21 | 108 | 30.0 |
| | 22-24 | 235 | 65.3 |
| | >24 | 17 | 4.7 |
| Gender | Male | 326 | 90.6 |
| | Female | 34 | 9.4 |
| Academic year | Second year | 30 | 8.3 |
| | Third year | 55 | 15.3 |
| | Fourth year | 43 | 11.9 |
| | Fifth year | 76 | 21.1 |
| | Sixth year | 129 | 35.8 |
| | Intern | 27 | 7.5 |
| Social status | Single | 343 | 95.3 |
| | Married | 17 | 4.7 |
| College | Medicine | 340 | 94.4 |
| | Paramedics | 20 | 5.6 |
| Age Mean (SD) | 22.2 (SD = 1.66) | | |

Table 2. The frequency of students' attitudes toward kidney stones.

| Category | Answers | N | % |
|---|-------------------|-----|------|
| The implication of calcium intake in kidney stone prevention formation | Strongly agree | 155 | 43.1 |
| | Agree | 112 | 31.1 |
| | Not sure | 53 | 14.7 |
| | Disagree | 26 | 7.2 |
| | Strongly disagree | 14 | 3.9 |
| The effectiveness of declining dietary oxalate in reducing the risk of kidney stone recurrence | Strongly agree | 78 | 21.7 |
| | Agree | 134 | 37.2 |
| | Not sure | 120 | 33.3 |
| | Disagree | 20 | 5.6 |
| | Strongly disagree | 8 | 2.2 |
| Individuals at greater risk of kidney stones should significantly raise their fluid intake | Strongly agree | 138 | 38.3 |
| | Agree | 129 | 35.8 |
| | Not sure | 47 | 13.1 |
| | Disagree | 31 | 8.6 |
| | Strongly disagree | 15 | 4.2 |
| Limiting salt intake lowers urinary calcium and thus prevents recurring stones | Strongly agree | 64 | 17.8 |
| | Agree | 146 | 40.6 |
| | Not sure | 116 | 32.2 |
| | Disagree | 24 | 6.7 |
| | Strongly disagree | 10 | 2.8 |
| Reducing animal protein consumption is an effective therapy for those at risk of stone recurrence | Strongly agree | 47 | 13.1 |
| | Agree | 79 | 21.9 |
| | Not sure | 173 | 48.1 |
| | Disagree | 50 | 13.9 |
| | Strongly disagree | 11 | 3.1 |
| Stone analysis is essential in the preventative measures of recurring kidney stones | Strongly agree | 105 | 29.2 |
| | Agree | 139 | 38.6 |
| | Not sure | 84 | 23.3 |
| | Disagree | 26 | 7.2 |
| | Strongly disagree | 6 | 1.7 |
| The importance of medical management in kidney stones | Strongly agree | 65 | 18.1 |
| | Agree | 120 | 33.3 |
| | Not sure | 112 | 31.1 |
| | Disagree | 50 | 13.9 |
| | Strongly disagree | 13 | 3.6 |
| Stone disease is incurable | Strongly agree | 11 | 3.1 |
| | Agree | 29 | 8.1 |
| | Not sure | 48 | 13.3 |
| | Disagree | 124 | 34.4 |
| | Strongly disagree | 148 | 41.1 |
| The importance of awareness and education in reducing stone disease | Strongly agree | 149 | 41.4 |
| | Agree | 141 | 39.2 |
| | Not sure | 48 | 13.3 |
| | Disagree | 14 | 3.9 |
| | Strongly disagree | 8 | 2.2 |

Table 3. The association between students' college and their attitude toward kidney stones.

| Category | Answers | College | | p-value |
|---|-------------------|----------|------------|---------------|
| | | Medicine | Paramedics | |
| The implication of calcium intake in kidney stone prevention formation | Strongly agree | 151 | 4 | 0.007* |
| | Agree | 106 | 6 | |
| | Not sure | 48 | 5 | |
| | Disagree | 21 | 5 | |
| | Strongly disagree | 14 | 0 | |
| The effectiveness of declining dietary oxalate in reducing the risk of kidney stone recurrence | Strongly agree | 75 | 3 | 0.288 |
| | Agree | 122 | 12 | |
| | Not sure | 116 | 4 | |
| | Disagree | 19 | 1 | |
| | Strongly disagree | 8 | 0 | |
| Individuals at greater risk of kidney stones should significantly raise their fluid intake | Strongly agree | 127 | 11 | 0.087 |
| | Agree | 125 | 4 | |
| | Not sure | 46 | 1 | |
| | Disagree | 27 | 4 | |
| | Strongly disagree | 15 | 0 | |
| Limiting salt intake lowers urinary calcium and thus prevents recurring stones | Strongly agree | 62 | 2 | 0.067 |
| | Agree | 140 | 6 | |
| | Not sure | 106 | 10 | |
| | Disagree | 24 | 0 | |
| | Strongly disagree | 8 | 2 | |
| Reducing animal protein consumption is an effective therapy for those at risk of stone recurrence | Strongly agree | 45 | 2 | 0.439 |
| | Agree | 72 | 7 | |
| | Not sure | 166 | 7 | |
| | Disagree | 46 | 4 | |
| | Strongly disagree | 11 | 0 | |
| Stone analysis is essential in the preventative measures of recurring kidney stones | Strongly agree | 101 | 4 | 0.003* |
| | Agree | 124 | 15 | |
| | Not sure | 84 | 0 | |
| | Disagree | 26 | 0 | |
| | Strongly disagree | 5 | 1 | |
| The importance of medical management in kidney stones | Strongly agree | 62 | 3 | 0.751 |
| | Agree | 112 | 8 | |
| | Not sure | 108 | 4 | |
| | Disagree | 46 | 4 | |
| | Strongly disagree | 12 | 1 | |
| Stone disease is incurable | Strongly agree | 9 | 2 | 0.390 |
| | Agree | 27 | 2 | |
| | Not sure | 45 | 3 | |
| | Disagree | 117 | 7 | |
| | Strongly disagree | 142 | 6 | |
| The importance of awareness and education in reducing stone disease | Strongly agree | 129 | 4 | 0.225 |
| | Agree | 145 | 12 | |
| | Not sure | 46 | 2 | |
| | Disagree | 13 | 1 | |
| | Strongly disagree | 7 | 1 | |

35.8%). Furthermore, most students were single ($n = 343$, 95.3%). Additionally, the department of medical students has the highest response rate ($n = 340$, 94.4%) (Table 1).

Table 2 shows the students' attitude frequency regarding kidney stones. Most students have a positive attitude toward most kidney stones; their general attitude includes the importance of calcium intake, increased fluid intake, and declining dietary oxalate and salts. Furthermore, students show a positive attitude toward stone analysis, medical management, and the efficacy of awareness and education to prevent stone disease. On the other hand, students have reported a negative attitude toward the incurability of stone disease, as the majority corresponds to "strongly disagree" ($n = 148$, 41.1%). Moreover, most students show an undermining attitude toward the importance of reducing animal protein products in lowering the risk of stone recurrence ($n = 173$, 48.1%) (Table 2).

A significant association was found between students from the department of medicine and their attitude toward the implication of calcium intake for kidney stone prevention, as the majority corresponded to "strongly agree" ($n = 151$). In contrast, students from the department of paramedics have significantly corresponded to "agree" ($n = 6$) ($p = 0.007$). Furthermore, a significant variation was shown between the importance of the analysis and students from the department of medicine and paramedics, as the majority corresponded to "agree" ($n = 124$ and 15 , respectively) ($p = 0.003$) (Table 3).

Discussion

Our study demonstrated an overall good attitude toward urolithiasis. A study done by Baatiah et al. [1] showed an inadequate level of knowledge among their participants despite a high level of urolithiasis. However, [10] revealed a good level of knowledge and a poor attitude. Additionally, [1] a study of urologists reported a suboptimal level of knowledge about stone recurrence prevention programs, in which they inadequately apply guidelines on stone prevention in their daily practice. Another study conducted among students reported that participants had some knowledge of the symptoms, mode of diagnosis, and prevention of kidney stone disease [12]. A study conducted in Sweden among 100 patients referred for active stone removal revealed favorable sentiments toward preventing recurrent kidney stones [13]. A study conducted in Hong Kong to assess the public's knowledge of renal stone prevention techniques revealed that the public and the city's stone patients lack sufficient information and awareness [4]. Another patient study revealed a negative attitude toward lithotripsy [14]. Our study has some possible limitations, including non-response bias, as it collected data from an online survey. Another limitation is that the number of male participants and students from the medical department exceeds the number of female participants and students from the paramedic department, which could have affected overall attitudes.

Conclusion

Our finding indicates a negative attitude toward the curability of kidney stones. Thus, education and awareness programs should be employed in health-related departments to maximize the benefit. We also recommend an extensive investigation based on a sizable population as a public health measure due to the rising incidence of kidney stones.

List of Abbreviations

SPSS Statistical Package for the Social Sciences

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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Consent to participate

Written informed consent was obtained from all the participants.

Ethical approval

The study was approved by the Medical Ethics Committee of Umm Al-Qura University. Ethical approval code: (HAPO-02-K-012-2022-06-1135) in 2022.

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