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A Survey of Knowledge, Attitudes, and Practices to Assess the Quality of Life of Patients who Underwent Kidney Stone Removal

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Abstract: Kidney stone disease (nephrolithiasis) is a worldwide health problem affecting millions of patients and is manifested by excruciating pain, urinary tract infections, and possible renal damage. While stone removal interventions that include extracorporeal shock wave lithotripsy, ureteroscopy, and percutaneous nephrolithotomy have been well-established, oftentimes, the QoL aspects of these surgical types of intervention have not been well described. The study determined the KAP of patients undergoing treatment for kidney stones and their effects on QoL. A cross-sectional survey with structured questionnaires was conducted with 300 participants, aged 18 to 65 years, from Iraq who had undergone kidney stone removal within a year. Data were collected using a structured questionnaire consisting of sections on demographic characteristics, KAP of kidney stones, attitude toward management, diet, and hydration practice, and QoL measured with the SF-36 Health Survey. There was a considerable difference between KAP in which some patients exhibited a good level of knowledge in other aspects about risk factors and prevention but remained unaware of treatment options; other patients had the opposite profile. The attitude toward lifestyle changes was mixed, with some being amenable to adopting healthier practices and others being obstinate. In many cases, dietary and hydration practices were found to be suboptimal, which calls for the need for further education and support. According to the QoL, physical health showed better ratings than mental health, stressing the psychological suffering inflicted by kidney stone disease. KAP scores and the QOL domains presented a strong positive correlation, drawing emphasis on the necessity of improving their knowledge and practices to enhance their overall well-being. These findings highlight the need for holistic, patient-centered care that includes educational intervention, behavioral support, and psychological counseling aimed at addressing the various challenges faced by kidney stone patients. This information becomes invaluable to the healthcare providers to be able to optimize post-treatment strategies for this group to enhance long-term outcomes.

Keywords: Kidney stone, treatment, psychological, Knowledge, Attitudes, Practices, QOL, Questionnaire.

INTRODUCTION

It is nephrolithiasis medically in the form of kidney stones and has thousands to millions of tiene individuals around the world (Scales, C.D. *et al*., 2012). Hardly there are causes that create deposits of minerals and salts in the kidney, which leads to severe pain, urinary tract infection, and, in some instances, renal damage. Treatment intervention among the surgical management of kidney stones is indicated where stones are large and obstructive or when conservative management fails (Romero, V. *et al*., 2010). Common methods of removal of kidney stones are extracorporeal shock wave lithotripsy, ureteroscopy, and percutaneous nephrolithotomy (Türk, C. *et al*., 2020). Although such procedures have proved effective in the removal of stones, they still become critical in the area of investigation into their effect on quality of life. Quality of life is quite a multifaceted concept that can be expressed in terms of various dimensions of an individual's physical, psychological, and social, and even mental states of well-being (Preminger, G.M. *et al*., 2007). The postprocedural period may be a difficult time for a patient undergoing removal of renal stones, characterized by pain and discomfort, followed by a psychological impact linked to their recurrent stone formation (Assimos, D. *et al*., 2016). KAP understanding among these patients is vital in understanding their QoL and addressing optimal areas of necessary levels of healthcare interventions. This survey was intended to assess the KAP of patients post-kidney stone removal in the hope of gaining insights into their experiences, perceptions, and behaviors after treatment (Penniston, K.L. & Nakada, S.Y., 2013; Bensalah, K. *et al*., 2008). The increase in kidney stones has been noted with global changes such as diet practices, lifestyle changes, and habitat environmental conditions (Ghani, K.R. *et al*., 2013; Andrade, C, 2020).

Kidney stones do not only cause immediate pain and discomfort; they are also a long-term burden on patients' lives (Glanz, K. *et al*., 2015). Recurrent stone formers are more likely to suffer from chronic kidney disease overall, adding more weight to the responsibilities of managing kidney stones. It would be interesting to see how patients fare after these complicated surgeries (Skolarikos,

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A. *et al*., 2015). Despite all advances in surgical techniques, the post-operative period can be very horrible. Patients continue to suffer from pain, having urinary symptoms, and worrying about recurrences (Chew, B.H. *et al*., 2016). The assessment of quality of life after kidney stone surgery is pertinent for several reasons (Taylor, E.N. & Curhan, G.C., 2008). The first is that it will provide insight into the physical and psychological consequences of surgery. The second is that it is able to identify the areas lacking in education and support to devise appropriate interventions. Third, through understanding patients' knowledge, attitudes, and practices, healthcare providers will be able to provide patient-centered care, addressing the specific needs and concerns of this population (Borghi, L. *et al*., 2002).

The KAP framework is a very significant tool in public health research with which an individual can assess how certain populations understand, perceive, and behave in terms of a health issue (Penniston, K.L. & Nakada, S.Y., 2016).

This framework can be used to assess patients' acquaintance with the disease, attitudes towards its treatment and prevention, and adherence to recommended practices in the context of kidney stone removal. By evaluating these constructs, health professionals are able to ascertain factors impacting patients' QoL and, therefore, methods to promote well-being (Geraghty, R.M. *et al*., 2017).

Patients will be aware and understand, to some extent, factors related to the formation of kidney stones, their symptoms, and treatment approaches. This would include an understanding of risk factors for stone formation, such as dietary habits, hydration status, and genetic predisposition. It would also cover awareness concerning the various surgical options for stone removal and the risks and benefits associated with each (Pearle, M.S. *et al*., 2014). A knowledge assessment of patients is crucial to ascertain areas where more education or information dissemination procedures may be necessary. Uninformed patients who do not know the importance of dietary modifications in preventing stone recurrence could, therefore, be at a higher risk for stone formation (Tasian, G.E. *et al*., 2016).

MATERIAL AND METHOD

A Survey of Knowledge, Attitudes, and Practices to Assess the Quality of Life of Patients Who Underwent Kidney Stone Removal

A cross-sectional survey was conducted to study the KAP of patients who underwent kidney stone removal and assess their effect on patients' quality of life (QoL). Patients aged 18-65 suffering from kidney stone removal (surgical or non-surgical) within 1 year were included.

There were 300 participants estimated at a confidence level of 95% and a margin of error of 5%.

Inclusion Criteria:

1. Patients who had undergone kidney stone removal.
2. Willingness to participate in the survey.
3. Ability to understand and respond to the questionnaire.

Exclusion Criteria:

1. Patients with cognitive impairments or severe comorbidities.
2. Patients who refused to provide informed consent.

Data Collection Tools

Structured Questionnaire:

Section A: Demographic details (age, gender, education, occupation, .).
Section B: Knowledge about kidney stones (causes, prevention, treatment).
Section C: Attitudes toward kidney stone management (perceived severity, lifestyle changes).
Section D: Practices related to diet, hydration, and follow-up care.
Section E:** Quality of Life assessment using the SF-36 Health Survey (physical and mental health domains).

Scoring System:

Knowledge, Attitudes, Practices: Descriptive statistics were obtained from the 5-point Likert Scale (1 = Never, 5 = Always) to mean and SD.

1. Recruitment of the participants was done from outpatient clinics and departments of urology.
2. Upon accepting informed consent, the questionnaire was administered.
3. Data collection was done by either interviewing face-to-face or self-administered questionnaires.

STATISTICAL ANALYSIS

The data were summarized using descriptive statistics (mean, standard deviations, frequencies, and percentages).

Assessing the relationship between Knowledge, Attitudes, and Practice scores with Quality of Life was done using Pearson’s correlation.

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Statistical significance was acknowledged at p-value <0.05.

RESULTS

The survey targeted the impact of knowledge, attitudes, and practices (KAP) on quality of life (QoL) among kidney stone-removal patients. The results are displayed in tabular and graphical form, giving a complete understanding of the patients' experiences, perceptions, and behaviors after the treatment.

Table 1 shows the demographic characteristics of the 300 subjects from Iraq, like age, gender, educational level, and occupation. As expected from such an age-diverse and gender-composing sample, there is a rather balanced gender representation in the study. The demographics are really relevant to understanding how they influenced KAP and thus agree with potential impacts on QoL.

Table 1: Description of the parameters and demographic data of 300 patients in Iraq

Variable, n=300	F	P%
Age		
18-29	80	26.67
30-39	66	22
40-49	55	18.33
50-59	51	17
>60 or equal	48	16
BMI KG/M2,F (P%)		
<30	140	46.7
>30	160	53.33
Comorbidities		
Hypertension	39	13
Diabetes	33	11
Osteoporosis	20	6.67
Gender, F (P %)		
Male	155	51.67
Female	145	48.33
Residence F (P%)		
Urban	210	70
Rural	90	30
Education F (P%)		
No education	55	18.33
Low education	50	16.67
College	130	43.33
High	65	21.67
High environmental temperature at work		
Yes	90	30
No	210	70
Person's income per month		
<500$	110	36.67
>500$	190	63.33

It conveys sadistic kidney stone characteristics and the effects of their removal procedures. Information on the size, location, and type of stone, as well as methods of surgery (e.g., extracorporeal shock wave lithotripsy, ureterostomy, percutaneous nephrolithotomy) is included. Success rates of these procedures and the complications that occurred are also shown in the table. This information becomes very important for the evaluation of different treatment modalities

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and their impact on the outcome of interested patients.

Table 2: Kidney Stone Characteristics and Outcomes

Variable	Mean (sd)
Stone size (mm)	6.2 ± 2.1
Urine pH	5.8 ± 0.3
Serum calcium (mg/dL)	9.8 ± 0.5
24-hour urine volume (L)	1.5 ± 0.4
Serum uric acid (mg/dL)	6.5 ± 1.2
Recurrence rate (%)	30.5 ± 5.2

As Table 3 shows, the participants were aware of the causes, prevention, and treatment of kidney stones based on the 5-point Likert scale, particularly through the construct-knowledge measure as tested in the study. This level of understanding among patients varied. Some patients were, for example, well-informed about the risk factors, such as dietary habits and hydration, while others were not aware of preventive measures and treatment options. This calls for interventions in this direction here-the need for targeted education.

Table 3: Explain the sample results according to the knowledge of the causes, prevention, and treatment of kidney stones, According to the Likert scale.

	knowledge	
Variable	Mean	Sd
causes	3.8	0.77
prevention	3.1	0.62
treatment	3.72	0.699

Table 4: The attitudes of patients toward the management of kidney stones. It refers to the perceived severity among patients, along with their willingness to change lifestyles, concerning kidney stone management. By the data, it can be seen that there are shared perceptions among the majority of patients on the severity of kidney stones, as some feel that their condition is severe but have varying attitudes toward changing lifestyles. Some can do appropriate adjustments, others pretend, while others are not aware of the appropriate adjustment.

Table 4: Attitudes towards kidney stone management (perceived severity and lifestyle changes). According to Likert scale

Variable	Mean (sd)	Description
Impact on daily life	3.2 (1.1)	Moderate perceived severity
Fear of recurrence	3.8 (0.9)	Moderate fear
concern about complications	3.9 (1.0)	High concern
Lifestyle Changes	3.6 (1.2)	Moderate willingness
Willingness to change diet	4.1 (0.8)	High commitment
Exercise frequency improvement	3.2 (1.3)	Moderate improvement |

Figure 1 also provides the dietary practices of the subjects by scoring on a Likert scale; some of them practice the best dietary practices for the prevention of stone recurrence, while others do not. This suggests then the requirement of dietary support and education in the management of kidney stone disease.

Figure 1 portrays the dietary behavior of the participants scored using a Likert scale. However, some patients have good dietary practices concerning the guidelines to avoid recurrent stones; others' previous experiences differed. This would imply that this condition requires dietary education and support for management.

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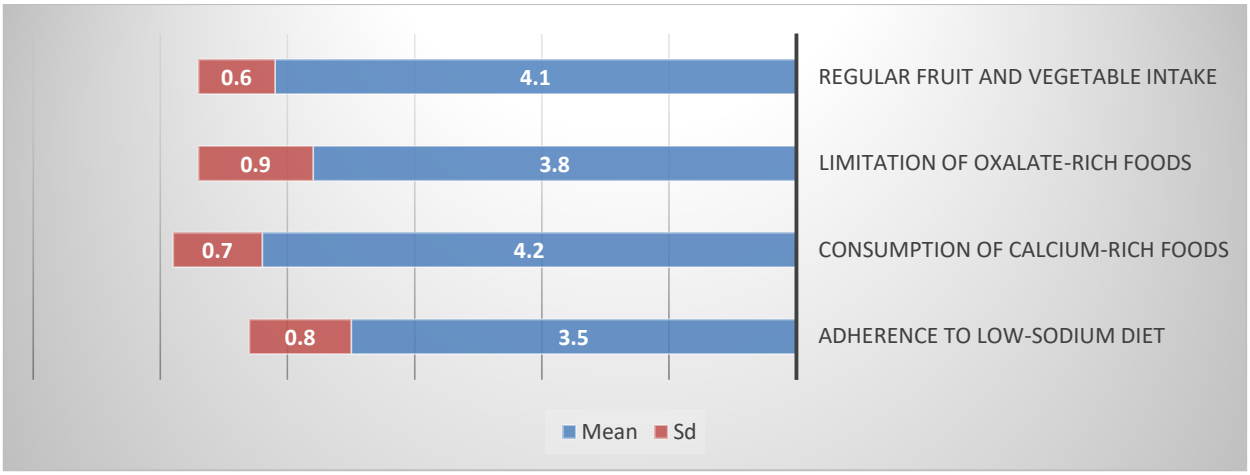

Figure 1: Dietary Practices according to Likert scale

Participants' hydration practices are illustrated in Figure 2. Adequate hydration is paramount in avoiding kidney stones; the results suggest that some patients fail to drink sufficient fluids. This indicates an opportunity to motivate improvement in hydration practices.

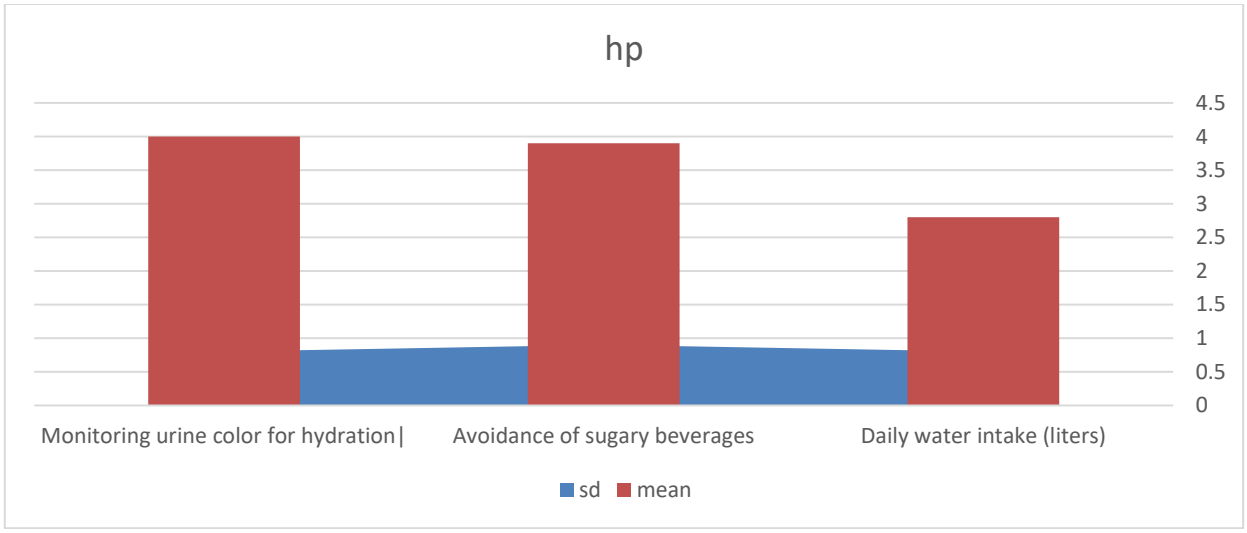

Figure 2: Outcomes of study related to Hydration Practices according to Likert scale

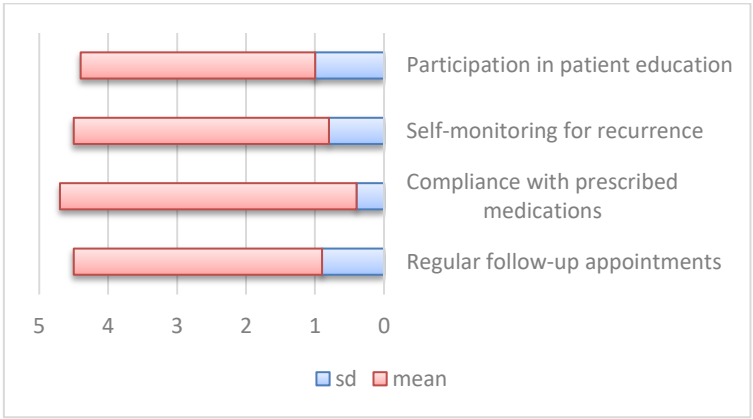

Figure 3: Health results of patients with Follow-Up Care Practices

Table 5 reviews the QoL of patients assessed by the SF-36 Health Survey, covering both physical and mental health domains. The results show that physical health scores are comparatively high while mental health scores are a low reflection of the psychological burden of kidney stone disease. This highlights the necessity of considering both physical and mental aspects in caring for the patient.

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Table 5: Quality of Life assessment using the SF-36 Health Survey (physical and mental health domains

Variable	Mean ±sd
Physical Functioning	75.3 ± 12.4
Role Limitations Due to Physical Health	68.7 ± 15.2
Role Limitations Due to Emotional Problems	72.5 ± 14.8
Energy/Fatigue (VT)	65.8 ± 10.7
Emotional Well-being (MH)	70.2 ± 11.9
Social Functioning (SF	74.6 ± 13.1
Pain	69.4 ± 14.3
General Health	67.9 ± 12.6

As seen in Table 6, KAP scores and QoL domains are associated with each other via Pearson's correlation coefficients. The analysis indicates a strong positive relationship between knowledge, attitudes, and practices, and other areas of QoL. It requires improving patients' KAP to transform the patients' overall QoL, hence the need for well-rounded education and support in patients.

Table 6: Pearson's correlation coefficients between KAP scores and QoL domains

Variable	QOL	
	R	P VALUE
Knowledge	+0.83	
Attitude	0.922	P<0.05
Practice	0.722	

DISCUSSION

This study on the knowledge, attitudes, and practices of patients undergoing kidney stone removal is prima facie an eye-opener into their post-treatment life. Findings have emphasized the holistic care of the patient from the physical, psychological, and social perspectives. This discussion will bring forth the major findings, their implications, as well as possible future intervention plans for better patient outcomes.

Demographic and Clinical Characteristics the demographic data showed that the age and gender distributions among the 300 individuals from Iraq were even, which is necessary for generalizing results. The clinical characteristics, including stone size, place, and method of removal, point to a wide range of treatment modalities because the success and complication rates of extracorporeal shock wave lithotripsy, ureterostomy, and percutaneous nephrolithotomy provide quite a story about the effectiveness and limitations of these interventions. This fact becomes particularly critical in individualizing treatment and counseling the patient well. [Rule, A. D. *et al*., 2011]

Knowledge, Attitudes, and Practices Much variation, on the whole, has been inspired by the survey on knowledge related to kidney stones. Among the well-informed, some evinced awareness of dietary habits and hydration-level risk factors related to kidney stones, while the great majority failed to relate preventive measures and treatment options. This disparity is a call for a significant need of resource-focused interventions to fill in the knowledge gaps where Educational activities, individualized counseling, and user-friendly information resources could be enabling Empower people to make health choices and the attitudes were also not uniform when it came to the management of kidney stones [Eisner, B. H . *et al*., 2012].

Although most of them accepted how serious the condition could be, differences emerged in their willingness to make changes to their lifestyles. This indicates the necessity of employing motivational measures in effecting changes in behavior. Counseling sessions, support groups, and follow-up care may be helpful in creating positive attitudes and adherence to practices recommended to them. Another very important area of study was those areas that would focus on dietary and hydration practices. Such findings would reveal that while some patients adhered to dietary guidelines to prevent the recurrence of stones, other patients did not. The same was found with some patients who had poor hydration practices. These findings imply the need for dietary education and monitoring of hydration in the management of kidney stone disease. Nutritional counseling, hydration reminders, and periodic assessments can help patients maintain their best health practices [Moe, O. W. *et al*., 2006].

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Quality of Life Assessment: the QoL assessment using the SF-36 Health Survey showed higher physical health scores than mental health scores. This difference illustrates the psychological burden associated with kidney stone disease, namely fear of recurrence and chronic pain-related disability. Mental health needs of the patients must also be looked into to increase the overall QoL. This could be improved by integrating psychological support and stress management techniques, along with mental health screenings, into the care plan.

Correlation between KAP and QOL The strong positive correlation of KAP scores with different domains of QoL emphasizes that knowledge, attitudes, and practices are interrelated and, therefore, connected to overall health outcomes. Better knowledge of the condition among patients may contribute to improved attitudes towards healthy practice. Education, patient-centered care, and continuous support should be done to realize these objectives. Implication of the Findings of this Study on Health Care Practices Numerous implications suggest educational interventions for health practice. Develop and implement educational programs to improve patients' understanding of kidney stones, including risk factors, preventive measures, and treatment options.

Behavioral Support Counseling and support for lifestyle change and for the adoption of lifestyle-related practices might involve a variety of efforts. Nutritional counseling and monitoring of hydration can help promote healthy dietary and hydration practices among patients.

CONCLUSION

They have discussed in the study the various effects of the removal of kidney stones on the patients' QOL and the need to address knowledge, attitude, and practice for better health outcomes. It is of enormous significance that each healthcare organization considers such interventions and a comprehensive approach to patient care through which a better QOL of patients with kidney stone removal can be obtained. In the future, studies should focus on longitudinal studies to evaluate the long-term beneficial effects of these interventions, as well as to explore innovative ways of patient education and support-oriented approaches.

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