

Knowledge, Attitude and Practice of Kidney Stone Formers in Armenia Regarding
Prevention of Kidney Stone Disease

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by

Vahe Bakunts, MD, MPH Candidate

Advisor: Varduhi Petrosyan, MS, PhD

Reader: Arusyak Harutyunyan, MD, MPH

College of Health Sciences
American University of Armenia
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List of Abbreviations

BMI Body Mass Index

KAP Knowledge, Attitude, Practice

KSD Kidney Stone Disease

SD Standard Deviation

PHPT Primary Hyperparathyroidism

DM Diabetes Mellitus

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Abstract

Background: One of the most common disorders in urology is Kidney Stone Disease (KSD). It affects about 10% of adult male and 5% of female population in the world and has a high recurrence rate. Research shows that future formation of kidney stones can be prevented by special diets (low in salt, spinach, fatty foods, animal proteins, and high in vegetables, water, and fresh fruits).

Objectives: The purpose of the study was to evaluate knowledge, attitude and practice (KAP) about KSD prevention among kidney stone formers in Armenia and identify their relationships with demographic characteristics.

Methods: Study design was cross-sectional telephone survey. The study included all patients from Mikaelyan Surgical Institute who were treated by lithotripsy during 2009-2011. The sampling frame included all the patients treated during this time period. The study team developed the study instrument based on instruments from the KAP Survey on Healthy Nutrition and Lifestyle and the guideline of the Armenian Urological Association. Basic descriptive statistics were used for describing demographic characteristics. Simple and multiple regression analyses were performed to test the associations between the main variables, while controlling for potential confounding and interactions.

Results: The study population included 140 patients, contact and refusal rates were 72.9% and 5.9%, respectively. Mean age of the participants was 46 ± 13.5 years and about 30% completed university education. The proportion of males and females was approximately equal. About half of the respondents (54%) had kidney stones at the time of the survey. In simple linear regression analysis the knowledge score and duration of disease were associated with the practice score ($p < 0.05$), and the association of gender with practice was marginally significant ($p = 0.06$). Multiple linear regression showed statistically significant association between practice score and knowledge score, marital status, gender, and interactions between knowledge and marital status and knowledge and duration of disease.

Conclusion: This is the first study conducted in Armenia that assessed KSD patients' knowledge, attitude, and practice for prevention of recurrence. The study showed that despite respondents' sufficient knowledge about KSD prevention they did not practice protective behavior. More research is needed to identify the reasons for this finding.

1. Introduction

1.1. Background

Kidney stone disease (KSD) is one of the most common disorders among urological diseases (1). The presence of a solid material in the urinary tract, normally devoted to the passage of urine is termed 'nephrolithiasis' or 'renal stone disease'. The solid bodies formed in the urinary tract are termed 'stones'(2). Kidney stones often do not cause any symptoms. The main symptom of a kidney stone disease is an extreme pain in the back, which begins when a moving stone blocks the urethra. Nausea and vomiting can also accompany the pain (3).

1.1.1. Epidemiology

Kidney stone disease is a common disorder with a lifetime prevalence of 10-12% in men and 5-6% in women (4). It has a high recurrence rate: 14.0% after one year, 25.0%-31.5% after five years, 49.0%-52.0% after ten years, and 72.0% after twenty years (5;6).

The prevalence of the KSD and the type of stones varies in different countries. In Iceland the prevalence of nephrolithiasis is lower than reported elsewhere: 4.3% in men and 3.0% in women (7). In the United States of America (US) the distribution of KSD is 12.0% among men and 5.0% among women (1). Adult men are more commonly affected by kidney stones than women; while among children the proportion of the disease is approximately the same in both genders (1%-3%) (8).

1.1.2. Etiology

The etiology of kidney stones is multifactorial, with environmental and genetic factors contributing to the pathogenesis. About 80% of all kidney stones are composed of calcium salts, the other 20% have different components such as uric acid, struvine and cysteine (7).

There are several risk factors associated with the development of kidney stone disease.

Genetic Factor: A recent study based on the Vietnam Era Twin Registry suggested a strong genetic component, which showed an estimated heritability of the risk for kidney stones of 56% (9).

Age: Stone occurrence is relatively uncommon before age 20, and the incidence rate is the highest in the age group 40-60 years old (10). According to another study after age 30 years old the number of stone formers continuously increases among men while among women the peak for stone formation is at the age interval 60 to 69 years old (11).

Gender: Stone disease affects adult men more commonly than adult women; different studies suggest that men are affected two to three times more frequently than women (1).

Climate: A higher prevalence of stone disease is found in hot or dry climates such as mountains and desert areas. The Evans et al study, conducted in 2005, reported that the number of cases of renal colica¹ around military personnel increased after arrival in Kuwait and Iraq (12).

Body Mass Index (BMI) and Weight – There is a strong association between BMI and kidney stone formation (13;14). Studies report that high BMI and weight can decrease urine pH, which can play a big role in the stone formation process (13;14).

Water Intake: There is an inverse association between high water intake and kidney stone formation (15;16). Research suggests that high water intake can lower long-term risk of nephrolithiasis recurrence by approximately 60%(15).

Co-morbidities: Renal tubular acidosis, Dent's disease, hyperparathyroidism(PHPT), primary hyperoxaluria, hypercalciuria, and medullary sponge kidney disease can increase the risk of KSD (1). About 10–20% of patients with primary hyperparathyroidism make stones, which accounts for about 5% of calcium stone formers (17;18). In chronic acidosis of renal origin, such

¹Renal colica is a type of abdominal pain commonly caused by kidney stones.

as distal renal tubular acidosis, the high urinary pH predisposes to the formation of calcium phosphate stones (19).

Occupation: Heat exposure and dehydration are occupational risk factors for stone disease (20;21). For example, steel workers exposed to high temperatures have a significantly higher incidence of stones compared with those working in normal temperatures (20).

Diet: Several studies proved strong association between diet and occurrence of kidney stones (22-27).

1. **Animal protein intake:** Epidemiologic studies from a number of countries show that the incidence of renal stones is higher in populations with high animal protein intake (22).
2. **Fruit and vegetable intake:** Increasing the amount of fruits and vegetables in the daily diet can be very effective in preventing kidney stones (23).
3. **Dietary oxalate intake:** There is evidence about preventive function of low oxalate diet on the stone formation process. Prospective observational studies found strong association between higher oxalate diet and stone formation among men and old women (24). Foods that contain large amount of oxalate are rhubarb, spinach, strawberries, chocolate, wheat bran, nuts, beets, and tea.
4. **Sodium intake:** Increased sodium intake is linked to increased urinary calcium excretion and increased calcium stone formation (25;26;28).
5. **Sucrose and fructose intake:** The role of carbohydrates, such as sucrose and fructose, in renal stone formation process has been shown in a few studies(27).
6. **Calcium intake:** Higher urinary calcium is a common finding among stone formers (28;29). However, if there is no other strong reason to decrease the amount of calcium

intake, restriction of calcium in the consumed food is not recommended. Minimal necessary amount of calcium for adults is about 1,000 mg per day (28;29).

1.2. Situation in Armenia

While kidney stone disease is a public health problem in other countries, there is no official data about the incidence and prevalence of KSD in Armenia. One study providing data about geographical localization of renal stone disease presented Armenia in the list of countries that have high risk of developing renal stones (30).

1.3. Study Aims

This study aimed to assess the current knowledge, attitude, and practice (KAP) of treated renal stone formers about risk factors and preventive methods of kidney stone disease.

The research questions of the study were:

- What are the knowledge, attitude, and practice of the treated stone formers about kidney stone disease prevention?
- What is the relationship between the adherence to the preventive procedures (practice score) and knowledge score about renal stones recurrence prevention after controlling for all possible risk factors and demographic characteristics?

2. Methods

2.1. Study Design

A cross-sectional telephone based survey was used to investigate general knowledge, attitudes, and practices related to kidney stone disease risk factors and ways of prevention among treated stone formers in Armenia.

2.2. Study Population

The study was conducted among the patients of Mikaelyan Surgical Institute who were treated for KSD in 2009-2011. The study team approached the two main hospitals that provide lithotripsy services in Yerevan and asked the administration to participate in the study. Only one of the hospitals gave permission to conduct the study.

The study population included patients treated in Mikaelyan Surgical Institute, Department of Urology during the period January 1, 2009 to January 1, 2011. The Armenian Urological Association together with the European Urological Association developed a guideline about treatment and prevention of urological diseases (including kidney stone disease) in 2008 (31), that is why the current study focused on the patients treated after the guideline was in force.

Inclusion Criteria: The inclusion criteria included being 18 years old and over, willing to participate, ability to speak and understand Armenian, and being treated for kidney stones by lithotripsy.

Exclusion Criteria: Absence of contact information was the only exclusion criterion.

2.3 Sample Size Calculation

Sample size was calculated using the formula for estimating proportions (32): $n = z^2 p (100 - p) / e^2$ where n is the required sample size, z is a value of corresponding to significance level, p is the expected percentage of people with adequate knowledge and practices, and e is the level of precision.

Since no information existed based on which the study could come up with an estimated prevalence in Armenia, the most conservative estimate (yielding the largest sample size) of p=50% was used. Thus, assuming the significance level of 5% and precision level of 10%, the required sample size was $n = 1.96^2 * 50(100-50) / 10^2 = 96$. A similar study conducted in Hong

Kong reported a refusal rate of about 30% (33). The final sample size was calculated to be $96/0.7=137$.

2.4. Sampling Strategy

All 140 patients treated in Mikaelyan Surgery Institute in the Department of Urology by lithotripsy during 2009-2011 were included in the study.

2.5. Data Collection

Data were collected in April 2011 by interviewer administered telephone interviews. The student investigator administered all the interviews using a structured questionnaire. To maximize the contact rate the interviews were conducted during the evening hours (from 6pm to 9pm) on workdays and at any time (from 12pm to 9pm) on weekends.

2.6. Study Instrument

The study team used the Guideline of the Armenian Association of Urologists on the kidney stone disease to develop the KAP questions (34). Questions about personal diet were adapted from the KAP Survey on Healthy Nutrition and Lifestyle (35). Questions about demographic characteristics and socio-economic status were taken from the Nationwide Household Health Survey (36). Before the actual data collection the study team pre-tested the instrument among 10 KSD patients.

The questionnaire consisted of 22 close-ended and 9 open-ended questions and the main domains of the questionnaire were (Appendix 1):

1. Kidney stone disease history
2. Knowledge about prevention of KSD
3. Attitude toward prevention of the KSD
4. Practice of personal diet

5. Prescribed medication
6. Socio-demographic characteristics

Each telephone interview lasted approximately 12 minutes.

2.7. Variables

The primary dependent variable of this study was the practice score about kidney stone disease prevention (adherence to physician recommendation on preventive behavior). The main independent variable of interest was the knowledge score; the control variables included age, gender, occupation, education level, marital status and presence of co-morbidities (diabetes mellitus, chronic kidney disease, intestinal abnormalities, and thyroid diseases).

2.8. Data Management and Analysis

After the data collection the student investigator entered the data into the STATA 10 software and cleaned the dataset. To develop a knowledge score the study gave 1 point for every correct answer reported by a respondent and 0 point for every false answer. The same principle was used to calculate the practice score (Appendix 1).

Basic descriptive statistics were used to describe the characteristics of the participants. The study used simple and multiple linear regression analyses to test the relationships between the main variables of interest, and check for confounding and interactions.

2.9. Ethical Considerations

The study protocol received approval from the American University of Armenia's Institutional Review Board within the College of Health Sciences. Oral consent was obtained from each respondent (Appendix 2). Participation in the survey was voluntary, and respondents could skip any question and/or withdraw from the study at any time. Respondents did not receive any incentive for their participation and all the provided data were kept confidential.

3. Results

3.1. Descriptive Statistics

Overall, 140 patients were treated by lithotripsy during 2009 and 2010 in Mikaelyan Surgical Institute. A total of 140 telephone calls were made, out of which 38 phone numbers were incorrect and six patients refused to participate, which resulted in a final number of 96 participants (Figure 1). The refusal rate was 5.9%.

Out of 96 interviewed participants, 47 (49.0%) were men and 49 (51.0%) women. The mean age of participants was 45.9 years (SD 13.7). About one-third of respondents (30.2%) had university education, 82.3% were married and approximately 77.0% were employed (Table 2). The majority of the participants (63.5%) reported that their family average monthly spending was 50,000 - 200,000AMD.

About one-third (34.4%) of participants reported that they worked or continued to work in high temperature conditions (above 30⁰C); among them 14 (42.4%) were farmers and 13 (39.4%) were construction workers. The mean duration of working in high temperature conditions was 11.6 years (SD=3.3) (Table 3).

About 54.2% of the participants reported that they had kidney stones at the time of the survey and 22.9% reported that they did not check it recently (Table 3); 40.6% of the study participants reported having relatives who had the KSD; some participants reported having co-morbidities, including intestinal disorders (33.3%) and thyroid disease (10.4%) (Table 3).

The mean BMI calculated from the reported weight and height data was 27.5 kg/m² (SD=4.9); 65.6% of them were overweight (BMI \geq 25) (Table 2).

Most of the participants (92.7%) received some information concerning KSD prevention, and urologists were the most frequently reported source of information (94.4%) (Table 3).

The mean knowledge score was 15.6 (out of 19) with SD 1.8. None of the participants scored 0, and only one participant had the maximum score. About half of the participants agreed that KSD prevention was expensive; 67.0% of respondents believed that special diets could prevent KSD; and 66.0% agreed that it was more preferable for patients to make efforts to prevent KSD (Table 4). Among the specific knowledge questions, participants were mostly aware of the harmful effects of salt and spinach on the development of kidney stones (94.8% and 84.4%, respectively), and the beneficial effect of more water intake (99.0%), greens not including spinach (93.7%), fruits (92.7%), and low fatty foods (89.6%) in a person's diet for KSD prevention. Awareness of animal proteins and nuts as risk factors for developing KSD was relatively low (48.96% and 63.5%, respectively) (Table 5).

The mean practice score for participants was quite low - 9.1 (out of 19) with SD 1.2. The most commonly reported practices for prevention of KSD development were daily usage of vegetables (83.3%), fresh fruits (71.9%), more than 2 liters of water (79.1%), and reduced salt (73.3%) and fatty foods intake (81.2%) (Table 6).

Only about one-fourth of participants mentioned drugs prescribed for KSD prevention, and 21 out of 22 mentioned phytotherapy (Cyston, Kanephron, and Urinex) prescribed for prevention, which corresponds to the Armenian Urological Association's guideline (Table 6).

3.2. Regression Analysis

3.2.1. Simple Linear Regression

To analyze the relationship between the dependent variable (practice score) and the independent variable (knowledge score) and to check for confounders simple linear regression

for unadjusted bivariate associations was used. There was a statistically significant association between practice score and knowledge score of the participants concerning KSD prevention. Each one point increase in the knowledge score was associated with 0.18 point increase in the practice score, unadjusted for potential confounders (Table 7).

The practice score was also associated with the duration of the disease and the gender of the participants. For every 1 year increase in the duration of the disease, the practice score increased by approximately 0.05. Being a male respondent decreased the practice score by 0.47 (Table 7).

Simple linear regression analyses did not detect statistically significant associations between the major outcome variable - practice score of the participants and independent variables such as age, number of lithotripsy, current KSD status, genetic predisposition toward KSD, co-morbidities, education, marital status, employment status, average monthly income, and BMI.

Testing for Confounding

Table 8 presented the results of simple linear regression for associations between practice score, knowledge score, and other independent variables. Gender of the participants, duration of the KSD, and number of lithotripsy procedures were statistically significantly associated with the practice score of the participants. Having intestinal disorders, being married, working in hot condition and average family spending per month were statistically significantly associated with knowledge score. This analysis did not identify confounders for the relationship between the practice score and the knowledge score.

3.2.2. Multiple Linear Regression

The study checked for the potential interaction between knowledge score and other independent variables; only the interaction between the knowledge score and marital status was statistically significant (interaction term -0.35, $p=0.027$). Among the single patients every one point increase in knowledge score was associated with 0.46 point increase in the practice score ($p=0.001$), while this association for married respondents was not statistically significant ($p=0.230$) unadjusted for other variables of interest (Table 9).

Multiple linear regression analysis was performed to detect associations between the dependent and independent variables after adjusting for other independent variables and an interaction. The final model explaining the practice score included knowledge score, marital status, gender of the participant, duration of the disease, and interaction between knowledge score and marital status. Being a male patient was associated with a 0.48 decrease in the practice score ($p=0.060$), while being married increased it by 4.00 point ($p=0.080$) after adjusting for all other variables of interest (Table 10). Finally there was a strong association between the duration of KSD and the practice score: one year increase in the duration of KSD was associated with 0.05 points increase in the practice score ($p=0.001$).

The adjusted interaction term between the knowledge score and marital status was - 0.31 ($p=0.042$). The association between knowledge score and practice score was statistically significant only among single patients and after adjusting for gender and duration of the disease the study found that each unit of increase in the knowledge score was associated with 0.42 increase in the practice score (Appendix 4).

4. Discussion

Results of this study indicate that respondents generally were well aware of risk factors for developing KSD (the mean knowledge score was 15.6 (out of 19)). At the same time their practice score was quite low, approximately 9.1 (out of 19). This study suggests that there was a disconnection between the knowledge level of participants and their behavior.

The associations between knowledge score and practice score were different for single and married respondents. Knowledge score of patients had a greater positive impact on the practice score for single patients; this association was not statistically significant for the married patients. However, independent of the knowledge score, being married itself substantially improved the practice score. More research is needed to understand the reasons of such differences between single and married patients.

Statistically significant associations were also detected between practice score and gender and duration of the disease. Men were more likely to report lower practice score than women. The reason of such a finding could be that women are more attentive about health problems than men (37). Being married was also associated with a better preventive behavior. This could be due to spouses' influence on the behavior of the patients encouraging them to adopt better health practices (38). In addition, the association between the duration of KSD and practice score was strong: a longer time period from the time of the first diagnosis was associated with a higher practice score, because patients would improve their knowledge with longer experience of having the disease (39).

5. Strengths and Limitations

This is the first study conducted in Armenia to explore KAP among kidney stone formers. The patients included in the study were from different regions of Armenia.

However, the study was conducted only in one medical facility which can reduce the generalizability of the findings to all kidney stone formers in Armenia.

6. Conclusion

This study was the first study conducted to assess KAP related to KSD in Armenia. According to the study results participants generally had high knowledge about KSD prevention. Unfortunately, having good knowledge about prevention of KSD was not enough to change the behavior of the kidney stone formers to prevent future formation of kidney stones. This study suggested the need to conduct qualitative studies to explore barriers that restrict transformation of good knowledge into KSD recurrence prevention practice. In addition, conducting similar studies including the patients of other hospitals in Armenia would make the findings more generalizable.

Reference List

- (1) Pearle MS, Calhoun EA, Curhan GC. Urologic diseases in America project: urolithiasis. *The Journal of urology* 2005;173(3):848-57.
- (2) Andreucci VE. Preface. *Nephron* 1999;81(1):1.
- (3) Wikipedia.org. Kidney stone. Wikipedia org 2011 May 10 [cited 2011 Oct 10]; Available from: URL: http://en.wikipedia.org/wiki/Kidney_stone
- (4) Parks JH, Coe FL, Evan AP, Worcester EM. Urine pH in renal calcium stone formers who do and do not increase stone phosphate content with time. *Nephrology Dialysis Transplantation* 2009;24(1):130.
- (5) Uribarri J, Oh MS, Carroll HJ. The first kidney stone. *Annals of internal medicine* 1989;111(12):1006.
- (6) Ljunghall S, Hedstrand H. EPIDEMIOLOGY OF RENAL STONES IN A MIDDLE AGED MALE POPULATION. *Acta Medica Scandinavica* 1975;197(1 6):439-45.
- (7) Stamatelou KK, Francis ME, Jones CA, Nyberg LM, Curhan GC. Time trends in reported prevalence of kidney stones in the United States: 1976-1994. *Kidney international* 2003;63(5):1817-23.
- (8) Stapleton FB. Childhood stones. *Endocrinology and metabolism clinics of North America* 2002;31(4):1001-16.
- (9) Goldfarb DS, Fischer ME, Keich Y, Goldberg J. A twin study of genetic and dietary influences on nephrolithiasis: a report from the Vietnam Era Twin (VET) Registry. *Kidney international* 2005;67(3):1053-61.
- (10) HIATT RA, DALES LG, FRIEDMAN GD, HUNKELER EM. Frequency of urolithiasis in a prepaid medical care program. *American Journal of Epidemiology* 1982;115(2):255.
- (11) Knoll T, Schubert AB, Fahlenkamp D, Leusmann DB, Wendt-Nordahl G, Schubert G. Urolithiasis Through the Ages: Data on More Than 200,000 Urinary Stone Analyses. *The Journal of urology* 2011;185(4):1304-11.
- (12) Evans K, Costabile RA. Time to development of symptomatic urinary calculi in a high risk environment. *The Journal of urology* 2005;173(3):858-61.
- (13) Li WM, Chou YH, Li CC, Liu CC, Huang SP, Wu WJ, et al. Association of body mass index and urine pH in patients with urolithiasis. *Urological research* 2009;37(4):193-6.
- (14) Semins MJ, Shore AD, Makary MA, Magnuson T, Johns R, Matlaga BR. The association of increasing body mass index and kidney stone disease. *The Journal of urology* 2010;183(2):571-5.

- (15) Fink HA, Akornor JW, Garimella PS, MacDonald R, Cutting A, Rutks IR, et al. Diet, fluid, or supplements for secondary prevention of nephrolithiasis: a systematic review and meta-analysis of randomized trials. *European urology* 2009;56(1):72-80.
- (16) Borghi L, Meschi T, Amato F, Briganti A, Novarini A, Giannini A. Urinary volume, water and recurrences in idiopathic calcium nephrolithiasis: a 5-year randomized prospective study. *The Journal of urology* 1996;155(3):839-43.
- (17) Silverberg SJ, Shane E, Jacobs TP, Siris E, Bilezikian JP. A 10-year prospective study of primary hyperparathyroidism with or without parathyroid surgery. *New England Journal of Medicine* 1999;341(17):1249-55.
- (18) Parks J, Coe F, Favus M. Hyperparathyroidism in nephrolithiasis. *Archives of Internal Medicine* 1980;140(11):1479.
- (19) Moe OW. Kidney stones: pathophysiology and medical management. *The Lancet* 2006;367(9507):333-44.
- (20) Atan L, Andreoni C, Ortiz V, Silva EK, Pitta R, Atan F, et al. High kidney stone risk in men working in steel industry at hot temperatures. *Urology* 2005;65(5):858-61.
- (21) Pin NT, Ling NY, Siang LH. Dehydration from outdoor work and urinary stones in a tropical environment. *Occupational Medicine* 1992;42(1):30.
- (22) Taylor EN, Curhan GC. Diet and fluid prescription in stone disease. *Kidney international* 2006;70(5):835-9.
- (23) Meschi T, Maggiore U, Fiaccadori E, Schianchi T, Bosi S, Adorni G, et al. The effect of fruits and vegetables on urinary stone risk factors. *Kidney international* 2004;66(6):2402-10.
- (24) Taylor EN, Curhan GC. Oxalate intake and the risk for nephrolithiasis. *Journal of the American Society of Nephrology* 2007;18(7):2198.
- (25) Health Canada. *Dietary Reference Intakes*. Health Canada 2005 [cited 2011 Oct 10]; Available from: URL: http://www.hc-sc.gc.ca/fn-an/nutrition/reference/table/ref_elements_tbl-eng.php
- (26) Nouvenne A, Meschi T, Prati B, Guerra A, Allegri F, Vezzoli G, et al. Effects of a low-salt diet on idiopathic hypercalciuria in calcium-oxalate stone formers: a 3-mo randomized controlled trial. *The American journal of clinical nutrition* 2010;91(3):565.
- (27) Taylor EN, Curhan GC. Fructose consumption and the risk of kidney stones. *Kidney international* 2007;73(2):207-12.
- (28) Cappuccio FP, Kalaitzidis R, Duneclift S, Eastwood JB. Unravelling the links between calcium excretion, salt intake, hypertension, kidney stones and bone metabolism. *Journal of nephrology* 2000;13(3):169-77.

- (29) Curhan GC, Willett WC, Speizer FE, Spiegelman D, Stampfer MJ. Comparison of dietary calcium with supplemental calcium and other nutrients as factors affecting the risk for kidney stones in women. *Annals of internal medicine* 1997;126(7):497.
- (30) Mandel NS, Mandel GS. Urinary tract stone disease in the United States veteran population. II. Geographical analysis of variations in composition. *The Journal of urology* 1989;142(6):1516.
- (31) Türk C.,Knoll T.,Petrik A., Sarica K., Seitz C., Straub M., Traxe O. Guidelines on Urolithiasis. European Association of Urology 2010. Available from: URL: <http://www.uroweb.org/gls/pdf/Urolithiasis%202010.pdf>
- (32) Lu Ann Aday LJC. *Designing and conducting health surveys: a comprehensive guide*. San Francisco: Jossey-Bass; 1996.
- (33) Chan SWH, Ng CF, Man CW, Chung R, Li SK. OBJECTIVES. To investigate the prevalence and characteristics of patients with renal stone in Hong Kong, and awareness of corresponding prevention strategies. *Hong Kong Med J* 2008;14:427-31.
- (34) Armenian Urological Association. *Armenian Urological Association guidelines*. Yerevan Armenia; 2008.
- (35) American University of Armenia, Center for health services and research and development. *Knowledge, Attitude and Practice Survey on Healthy Nutrition and Lifestyle*. 2011.
- (36) American University of Armenia, Center for Health Services Research and Development. Primary Health Care Reform Project. Household Health Survey: Baseline Evaluation. 2006.
- (37) Wu B, Goins RT, Laditka JN, Ignatenko V, Goedereis E. Gender differences in views about cognitive health and healthy lifestyle behaviors among rural older adults. *The Gerontologist* 2009;49(S1):S72.
- (38) Wood RG, Avellar S, Goesling B. The effects of marriage on health: A synthesis of recent research evidence. Nova Science; 2009.
- (39) Gazmararian JA, Williams MV, Peel J, Baker DW. Health literacy and knowledge of chronic disease. *Patient education and counseling* 2003;51(3):267-75.

Table 1. Participants' socio-demographic characteristics

Variable		n (%)
Age (years)	Mean (SD)	45.9 (13.7)
Gender	Male	47 (49.0%)
	Female	49 (51.0%)
BMI (kg/m²)	<25	33 (34.4%)
	≥25	63 (65.6%)
Education	School (< 10 years)	9 (9.4%)
	School (10 years)	30 (31.2%)
	Prof. Technical education (10-13)	27 (28.1%)
	University	28 (29.2%)
	Postgraduate	1 (1.0%)
	Missing	1 (1.0%)
Marital status	Married	15 (15.6%)
	Single	1 (1.0%)
	Divorced	1 (1.0%)
	Widowed	79 (82.3%)
Employment status	Employed	4 (4.2%)
	Not employed	3 (3.1%)
	Self-employed	9 (9.4%)
	Seasonal worker or farmer	16 (16.7%)
	Student	15 (15.6%)
	Retired	49 (51.0%)
Household income (last month)	Less than 50,000 drams	10 (10.4%)
	From 50,000 - 100,000 drams	34 (35.4%)
	From 100,000 - 200,000 drams	27 (28.1%)
	From 201,000 - 300,000 drams	7 (7.3%)
	Above 300,000 drams	9 (9.4%)
	Don't know	9 (9.4%)

Table 2. Participants' KSD risk factors related characteristics

Variables	n (%)
Working in a hot condition (more than 30⁰C)	
Yes	33 (34.4%)
No	63 (65.6%)
Years of work in a hot condition	
Mean (SD)	11.6 (3.3)
Occupation of participants who worked in a hot condition	
Construction worker	13 (39.4%)
Farmer	14 (42.4%)
Manager	2 (6.1%)
Driver	3 (9.1%)
Mechanic	1 (3.0%)
Number of lithotripsy procedures	
One time	64 (66.7%)
Two or more times	32 (33.3%)
Existing stones in kidney currently	
Yes	52 (54.2%)
No	22 (22.9%)
Don't know	22 (22.9%)
KSD among close relatives	
Yes	3 (3.1%)
No	54 (56.3%)
Don't know	39 (40.6%)
Co-morbidities	
Diabetes mellitus	7 (7.3%)
Chronic kidney disease	8 (8.3%)
Intestinal abnormalities	32 (33.3%)
Thyroid diseases	10 (10.4%)
Receive any information about KSD reoccurrence prevention	
Yes	89 (92.7%)
No	7 (7.3%)
Information source	
Physician (urologist)	84 (94.4%)
Mass media (TV)	3 (3.4%)
Internet	1 (1.1%)
Other	1 (1.1%)

Table 3. Attitude of participants towards KSD prevention

Statements	n (%)		
	Agree	Disagree	Not Sure
KSD prevention is expensive	48 (50.0%)	31 (32.3%)	17 (17.7%)
Obesity is a sign of good health	3 (3.1%)	90 (93.8%)	3 (3.1%)
It is unlikely that a certain diet could prevent KSD development	23 (24.0%)	64 (66.7%)	9 (9.4%)
There is no need to make efforts to prevent KSD	24 (25.0%)	63 (65.6%)	9 (9.4%)

Table 4. Knowledge of participants about KSD prevention

Variable	n (%)
Sources of animal protein	
Red meat	95 (99.0%)
Chicken	95 (99.0%)
Greens	0
Cheese	81 (86.2%)
Fruit	0
Beans	0
Working in hot conditions is a KSD risk factor	20 (20.8%)
Consumption of certain foods to prevent KSD*	(only correct responses)
Vegetables	83 (86.5%)
Fruits	89 (92.7%)
Sugary foods	72 (75.0%)
Fish and sea foods	57 (59.4%)
Meat	47 (49.0%)
Greens	90 (93.8%)
Nuts	61 (63.5%)
Salty foods	91 (94.8%)
Water	95 (99.0%)
Fatty foods	86 (89.6%)
Dark chocolate	72 (75.0%)
Spinach	81 (84.4%)
Eggs	38 (39.6%)

* Correct answers are available in Appendix 3

Table 5. Practice of participants related to KSD prevention

Variables	Values: n (%)
Medication prescribed to prevent KSD	
Yes	22 (22.9%)
No	48 (50.0%)
Don't know	26 (27.1%)
Prescribed medication to prevent development of new kidney stones	
Alkaline citrates	1 (4.6%)
Magnesium	0
Allopurinol	0
Phytotherapy	21 (95.5%)
Adherence to medical treatment among those who were prescribed medication	20 (90.9%)
Frequency of consumption of certain food items** (only correct responses)	
Milk and milk products	14 (14.6%)
Eggs	66 (68.8%)
Red meat	38 (39.6%)
Fish and sea foods	41 (42.7%)
Fresh fruits	88 (91.7%)
Vegetables	91 (94.8%)
Dark chocolate	69 (71.9%)
Nuts (almond, walnut, peanut)	88 (91.7%)
Tea	25 (26.0%)
Salty foods	78 (81.3%)
Fatty foods	88 (91.7%)
Water - more than 2 liters	94 (97.9%)
Spinach	93 (96.9%)

** Correct answers are available in Appendix 3

Table 6. Simple linear regressions: associations between the practice score and independent variables

Variable	β coefficient	95% CI		P - value
Knowledge score	0.18	0.04	0.32	0.011
Gender	-0.47	-0.97	0.02	0.060
Duration of KSD	0.05	0.02	0.08	0.001

Table 7. Simple linear regression: testing for confounding

Variable	Practice score				Knowledge score			
	β coef.	CI 95%		p value	β coef.	CI 95%		p value
Age	0.01	-0.01	0.03	0.397	0.02	-0.010	0.41	0.246
Gender (Male)	0.47	-0.20	0.97	0.060	0.25	-0.46	0.96	0.494
Duration of the disease	0.05	0.021	0.08	0.001	0.01	-0.38	0.05	0.785
Number of lithotripsy	0.30	-0.02	0.63	0.065	0.09	-0.38	0.55	0.711
Current KSD status	-0.003	-0.10	0.003	0.331	-0.01	-0.02	0.003	0.158
Genetic predisposition	0.37	-0.14	0.88	0.160	1.50	-1.12	4.12	0.260
Diabetes Mellitus status	-0.62	-1.58	0.34	0.200	-0.28	-1.65	1.09	0.680
Chronic. Kidney disease status	0.35	-0.40	0.23	0.610	0.35	-0.08	0.8	0.110
Intestinal Disease	-0.25	-0.78	0.28	0.350	0.75	0.01	1.49	0.050
Thyroid disease	0.18	-0.65	1.01	0.660	0.59	-0.56	1.75	0.310
Marital status	-0.05	-7.00	0.60	0.880	1.22	0.32	2.12	0.010
BMI	0.01	-0.04	0.06	0.680	0.05	-0.03	0.12	0.200
Work in hot condition	-0.01	-0.04	0.01	0.350	-0.06	-0.09	-0,024	0.001
Average family spending	0.005	-0.005	0.015	0.300	0.005	-0.01	0.02	0.020
Education	-0.29	-0.83	0.25	0.293	-0.3	-1.07	0.47	0.440

Table 8. Interaction between marital status and knowledge score

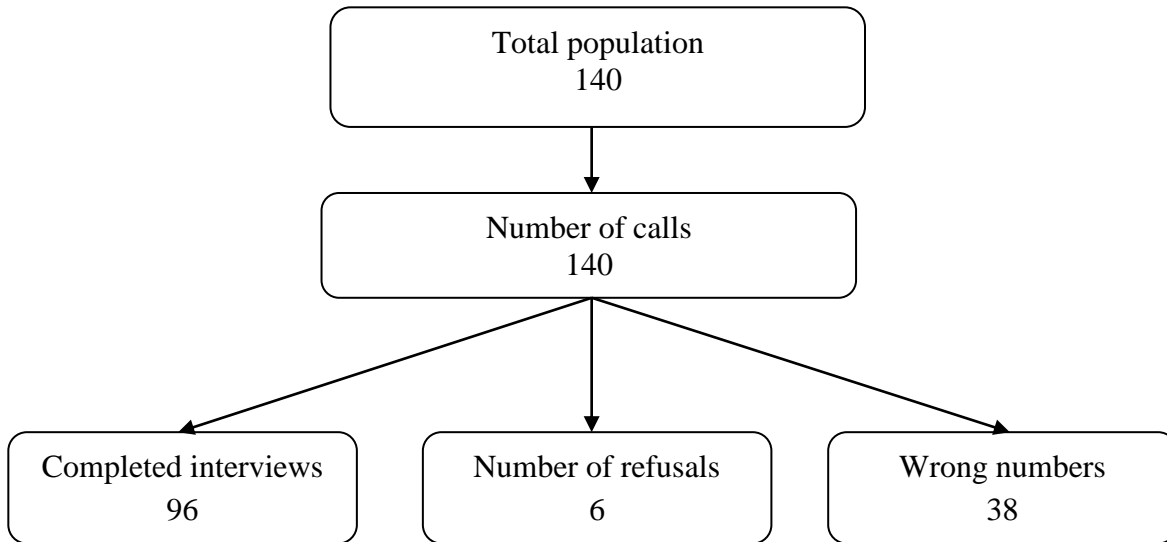
Marital status	β coefficient	95% CI		p- value
Single	0.46	0.19	0.73	0.001
Married	0.10	-0.07	0.27	0.230
Interaction term - Knowledge*marital status	-0.36	-0.68	-0.04	0.027

Table 9. Multiple linear regression: associations between the practice score and KSD risk factors

Variable	β coefficient	95% CI		p- value
Knowledge score	0.42	0.17	0.68	0.001
Gender	-0.48	-0.93	-0.04	0.035
Being married	4.00	-0.48	8.48	0.080
Duration of the disease	0.05	0.02	0.08	0.001
Interaction term - Knowledge*marital status	-0.31	-0.61	0.01	0.042

Figures

Figure 1.



Appendix 1

Questionnaire: English and Armenian versions

American University of Armenia

Knowledge, attitude and practice of the kidney stone formers in Armenia regarding prevention of kidney stone disease (KSD)

Questionnaire

Demographic Information

Date ____/____/____

ID _____

Starting time _____

1. Age (in years) _____

2. Gender

1. Male 2. Female

Kidney Stone Disease History

3. When have you been diagnosed with kidney stone disease for the first time? _____ (in years)

4. How many times did you undergone through lithotripsy? _____

5. Do you currently have KSD?

1.Yes 2.No 88.Don't know

6. From your direct relatives (parents, sisters and brothers) did anyone ever have kidney stone disease?

1. Yes 2.No 88. Don't know

7. Besides kidney stone disease have you been diagnosed with any of these diseases? (Check one answer for each disease)

Disease	Yes	No	Not sure
7.1.Diabetes mellitus	1	2	88
7.2.Chronic kidney disease	1	2	88
7.3.Intestinal abnormalities	1	2	88
7.4. Thyroid diseases	1	2	88
7.5. Other _____			

Questions about attitude of the treated patients toward prevention of the KSD

Do you agree or disagree with the following statements?	Agree	Disagree	Not Sure
8. KSD prevention is expensive	1	2	88
9. Obesity is a sign of good health	1	2	88
10. It is unlikely that a certain diet could prevent KSD development	1	2	88
11. There is no need to make efforts to prevent KSD	1	2	88

Knowledge about prevention of KSD

12. Did you receive any information about kidney stone disease prevention?

1. Yes
2. No (*If no, go to question 15*)

13. Who provided the information? (Check all that apply)

1. Physician (Urologist)
2. Printed brochures
3. Mass media (TV)
4. Internet
5. Other _____

14. Do you think that the information received helped you to make changes in your diet and lifestyle?

1. Yes
2. To some extent
3. No

15. Do you think that health experts recommend consuming more, the same amount or less of these foods to prevent KSD? (Check one box per food)

Food item	More	Less	Not sure
15.1. Vegetables	1	2	88
15.2. Fruits	1	2	88
15.3. Sugary foods	1	2	88
15.4. Fish and sea foods	1	2	88
15.5. Meat	1	2	88
15.6. Greens	1	2	88
15.7. Nuts	1	2	88
15.8. Salty foods	1	2	88
15.9. Water	1	2	88
15.10. Fattyfoods	1	2	88
15.11. Dark chocolate	1	2	88
15.12. Spinach	1	2	88
15.13. Eggs	1	2	88

16. In your opinion, which of the mentioned food items are sources of animal proteins? (Check all that apply)

- 1. Red meat
- 2. Chicken
- 3. Greens
- 4. Cheese
- 5. Fruit
- 6. Beans
- 88. Don't know

17. In your opinion, could working in a hot condition/under sun lead to KSD?

- 1. Yes
- 2. No
- 88. Don't know

Personal diet of the participants

18. How frequently do you consume the following food items? (Check one box per food)				
Food	Daily	Weekly	Monthly	Never
18.1. Milk and milk products (cheese, cottage etc)	1	2	3	4
18.2. Eggs	1	2	3	4
18.3. Red meat	1	2	3	4
18.4. Fish and sea foods	1	2	3	4
18.5. Fresh fruits	1	2	3	4
18.6. Vegetables	1	2	3	4
18.7. Dark chocolate	1	2	3	4
18.8. Nuts (almond, walnut, peanut)	1	2	3	4
18.9. Tea	1	2	3	4
18.10. Salty foods	1	2	3	4

Food	Daily	Weekly	Monthly	Never
18.11. Fatty foods	1	2	3	4
18.12. Water - more than 2 liters	1	2	3	4
18.13. Spinach	1	2	3	4

19. Did your physician prescribe you any medication to prevent KSD?

1. Yes 2. No (Skip to question 23) 88. Don't know / Don't remember (Skip to question 23)

20. What was prescribed by your physician to prevent further development of the kidney stones?

1. Alkaline citrates (Blemaren, Uralit-U, Uracit-K)
2. Magnesium (Magne-B6)
3. Allopurinol
4. Phytotherapy (Cyston, Kanephron, Urinex)
5. Other_____

21. Did you/do you use prescribed medications as they were/are prescribed?

1. Yes 2. No 88. Don't know / Don't remember

Socio-demographic questions

22. Marital status

1. Married
2. Separated/Divorced
3. Widowed
4. Single

23. Indicate the highest level of education that you have completed:

1. School (less than 10 years)
2. School (10 years)
3. Professional technical education (10-13 years)
4. Institute/University
5. Postgraduate

24. **Height** (in centimeters) _____

25. **Weight** (in kilograms) _____

26. Are you currently employed?

1. Yes
2. No
3. Self-employed
4. Seasonal worker or farmer
5. Student
6. Retired
7. Other (*specify*) _____

27. Did you ever work in a hot condition/under sun (more than 30 C⁰)?

1. Yes
2. No (Skip to the question 31)

28. How long have you worked in the hot condition/under sun?(in years)

29 Can you specify what kind of work you did/do?

30. Did you change your work after being diagnosed with KSD?

1. Yes

2.No

31. In average, how much money does your family spend monthly?

1. Less than 50,000 AMD
2. From 50,000 to 100,000 AMD
3. From 100,000 to 200,000 AMD
4. From 200,000 to 300,000 AMD
5. Above 300,000 AMD
88. Don't know/refusal

Thank you!

Interview end time __:__

**Երիկամաքարային հիվանդների գիտելիքները, վերաբերմունքը և պրակտիկան
երիկամաքարային հիվանդության կանխարգելման վերաբերյալ Հայաստանում**

Հարցաթերթիկ

Ամսաթիվ __/__/____/

ID _____

Հարցազրույցի սկիզբը _____ :_____

1. Տարիքը _____

2. Սեռը

1. Արական 2. Իգական

Երիկամային հիվանդության պատմություն

3. Առաջին անգամ ե՞րբ է ձեզ մոտ ախտորոշվել երիկամաքարային հիվանդություն (ԵՔՀ) _____ (տարեթիվը)

4. Քա՞նի անգամ եք Դուք ենթարկվել քարափշրման _____

5. Ներկայումս Դուք ու՞նեք ԵՔՀ

1. Այո 2. Ոչ 88. Չգիտեմ

6. Ձեր ուղղակի հարազատներից (ծնողներ, քույր, եղբայր) որևէ մեկը երբևէ ու՞նեցել է ԵՔՀ

1. Այո 2. Ոչ 88. Չգիտեմ

7. Բացի ԵՔՀ-ից Դուք երբևէ ա՞խտորոշվել եք հետևյալ հիվանդություններով

Հիվանդություն	Այո	Ոչ	Համոզված չեմ
7.1.Շաքարային դիաբետ	1.	2.	88.
7.2.Քրոնիկ երիկամային հիվանդություն	1.	2.	88.
7.3.Աղիքային հիվանդություն	1.	2.	88.
7.4. Վահանագեղձի հիվանդություններ (զոք)	1.	2.	88.
7.5.Այլ _____	1.		

Հարցեր ստուգելու համար ԵՔՀ-ի կանխարգելման վերաբերյալ երիկամաքարային հիվանդների վերաբերմունքը

Հավատում եք, թե՝ ոչ, հետևյալ պնդումներին	Հավատում եմ	Չեմ հավատում	Վստահ չեմ
8. ԵՔՀ-ն կանխարգելումը ծախսատար է	1.	2.	88.
9. Գիրությունը առողջության նշան է:	1.	2.	88.
10. Անհավանական է որ որոշակի դիետան կարող է կանխել ԵՔՀ-ի զարգացումը	1.	2.	88.
11. Կարիք չկա ջանք գործադրել որպեսզի կանխարգելել ԵՔՀ-ը	1.	2.	88.

ԵՔՀ-ն վերաբերյալ գիտելիքները

12. Դուք ստա՞ցել եք որևէ տեղեկություն ԵՔՀ-ն կանխարգելման վերաբերյալ

1. Այո 2. Ոչ (Անցնել 15-րդ հարցին)

13. Ո՞վ է տրամադրել այդ տեղեկությունը (*կարդալ պատասխանները*)

1. Բժիշկը (Ուրոլոգ)
 2. Տպագիր գրքույկեր
 3. Ջանգվածային լրատվամիջոցներ (Հեռուստատեսություն)
 4. Համացանց(Ինտերնետ)
 5. Այլ աղբյուր_____

14. Ձեր կարծիքով ստացված տեղեկությունները օ՞գնել են Ձեզ փոփոխություններ մտցնել Ձեր սննդակարգի և ապրելակերպի մեջ

1. Այո 2. Որոշ չափով 3. Ոչ

<p>15. Ձեր կարծիքով մասնագետները խորհուրդ են տալիս սննդի մեջ ավելացնել, թե՛ պակասեցնել հետևյալ սննդամթերքների պարունակությունը ԵՔՀ-ի կանխարգելման համար: (Նշեք մեկ պատասխան ամեն սննդատեսակի համար)</p>			
Մննդատեսակ	Ավելացնել	Պակասեցնել	Համոզված չեմ
15.1. Բանջարեղեն	1.	2.	88.
15.2. Մրգեր	1.	2.	88.
15.3. Քաղցրավենիք և շաքարով հարուստ այլ սննդամթերք	1.	2.	88.
15.4. Ձկներեն և ծովամթերք	1.	2.	88.
15.5. Կարմիր միս	1.	2.	88.
15.6. Կանաչեղեն	1.	2.	88.
15.7. Ընկուզեղեն	1.	2.	88.
15.8. Աղի ուտելիքներ	1.	2.	88.
15.9. Ջուր	1.	2.	88.
15.10. Ճարպոտ սնունդ	1.	2.	88.
15.11. Սև շոկոլատ	1.	2.	88.
15.12. Սպանախ	1.	2.	88.
15.13. Հավի ձու	1.	2.	88.

16. Ձեր կարծիքով նշված սննդատեսակներից որո՞նք են համարվում կենդանական սպիտակուցի աղբյուր (*կարդալ պատասխանները*)

1. Կարմիր միս
2. Հավի միս
3. Կանաչեղեն
4. Պանիր
5. Մրգեր
6. Լոբի
88. Չգիտեմ

17. Ձեր կարծիքով շոգ պայմաններում/արևի տակ աշխատելը կա՞րող է բերել ԵՔՀ-ի զարգացման:

1. Այո

2. Ոչ

88. Չգիտեմ

Մասնակիցների անհատական սննդակարգը

18. Որքան հաճախ եք օգտագործում հետևյալ սննդատեսակները				
Սննդատեսակ	Ամեն օր	Շաբաթական մի քանի անգամ	Ամիսը մի քանի անգամ	Երբեք
18.1. Կաթ և կաթնամթերք (պանիր, կաթնաշոռ)	1.	2.	3.	4.
18.2. Հավի ձու	1.	2.	3.	4.
18.3. Կարմիր միս	1.	2.	3.	4.
18.4. Չկնեղեն և ծովամթերքներ	1.	2.	3.	4.
18.5. Թարմ մրգեր	1.	2.	3.	4.
18.6. Բանջարեղեն	1.	2.	3.	4.
18.7. շոկոլադ	1.	2.	3.	4.

18.8. Ընկուզեղեն (նուշ, ընկույզ, գետնանուշ)	1.	2.	3.	4.
18.9. Թեյ	1.	2.	3.	4.
18.10. Աղի ուտելիքներ	1.	2.	3.	4.
18.11. Ճարպոտ սննունդ	1.	2.	3.	4.
18.12. Ջուր մոտ 2 լիտր և ավել	1.	2.	3.	4.
18.13. Սպանախ	1.	2.	3.	4.

19. Ձեր բժիշկը նշա՞նակել է որևէ դեղամիջոց ԵՔՀ-ի կանխարգելման համար

1. Այո 2. Ոչ (Անցնել 22-րդ հարցին) 88. Չգիտեմ /Չեմ հիշում (Անցնել 22-րդ հարցին)

20. Ինչ դեղորայք է նշանակվել Ձեր բժշկի կողմից ԵՔՀ-ի հետագա կանխարգելման համար :

Նշել բոլոր հնարավոր պատասխանները (կարողալ պատասխանները)

1. Ալկալիական ցիտրատներ (Բլեմառեն, Ուռալիթ- Ս, Ուռացիտ- K)
2. Մագնեզիում (Մագնի-Յ6)
3. Ալլոպուրինոլ
4. Ֆիտոթերապիա (Ցիստոն, Կանեֆրոն, Ուրինեքս)
5. Այլ _____

21. Դուք օ՞գտագործել եք/օ՞գտագործում եք այդ դեղամիջոցները ինչպես նշանակվել է/

նշանակված է:

1. Այո 2. Ոչ 88. Չգիտեմ

Սոցիալ դեմոգրաֆիկ տեղեկություններ

22. Ամուսնական կարգավիճակը

1. Ամուսնացած
2. Առանձնացած / Ամուսնալուծված
3. Այրի
4. Միայնակ

23. Նշեք Ձեր ստացած կրթության ամենաբարձր մակարդակը

1. Թերի միջնակարգ (10 տարուց պակաս)
2. Միջնակարգ (10 տարի)
3. Միջնակարգ մասնագիտական (10-13 տարի)
4. Համալսարան , ԲՈՒՀ
5. Հետդիպլոմային

24. Ձեր հասակը (սանտիմետրերով)_____

25. Ձեր քաշը (կիլոգրամներով)_____

26 Ներկայումս Դուք ա՞շխատում եք

1. Այո
2. Ոչ
3. Տանն աշխատող
4. Սեզոնային աշխատող կամ հողագործ
5. Ուսանող
6. Թոշակառու
7. Այլ նշել_____

27. Դուք աշխատել եք/ա՞շխատում եք շոգ պայմաններում/արևի տակ (30 C° և բարձր)

- 1.Այո 2.Ոչ (Անցնել 31-րդ հարցին)

28.Ո՞րքան ժամանակ եք աշխատել/աշխատում շոգ պայմաններում/ արևի տակ (տարիներով)

29. Կա՞րող եք նշել ինչպիսի աշխատանք եք կատարել/կատարում

30. Դուք փո՞խել եք ձեր աշխատանքը ԵՔՀ-ով ախտորոշվելուց հետո

Այո

Ոչ

31. Միջինում ամսական ի՞նչքան գումար է ծախսում ձեր ընտանիքը

1. 50,000 դրամից քիչ
2. 50,000- ից 100,000 դրամ
3. 100,000-ից 200,000 դրամ
4. 200,000-ից 300,000 դրամ
5. 300,000 դրամից շատ

88.Զգիտեմ/ Հրաժարվում եմ պատասխանել

Շնորհակալություն

Հարցազրույցի ավարտի ժամը ____: ____

Appendix 2

Consent form: English and Armenian versions American University of Armenia

Title of Research Project: Knowledge, attitude and practice of kidney stone formers regarding kidney stone disease prevention in Armenia

Hello, my name is Vahe Bakunts. I am a medical student and a graduate student in the College of Health Sciences at the American University of Armenia. The AUA College of Health Sciences is conducting a study to investigate knowledge, attitudes and practices regarding prevention of kidney stone disease. The research is being conducting among patients who are treated stone formers living in Armenia.

You have been selected to participate in this study because you were treated in the department of Urology of the Mikaelyan Surgical institute from January 1 2009 to January 1 2011. If you are willing to participate I will ask you several questions regarding your disease history and your practice regarding disease prevention. The interview will last no more than 15 minutes.

Your participation in the study is voluntary. You may skip any question you think is inappropriate and even stop the interview at any moment you want without any undesirable consequences for you or your treatment. You can ask any questions you may have about this research study.

Your participation in the study poses no risk for you. The information obtained from you is important for the study. There is no direct benefit from the participation in this interview, but your participation in this study will help to understand how to improve medical care for kidney stone disease patients.

The information you provide is fully confidential and will be used only for the study. Your name will not appear on the questionnaire. Only general findings will be presented in the report. Your contact information will be destroyed upon completion of data collection. If you have more questions about this study you can contact Dr. Varduhi Petrosyan, the Associate Dean of the College of Health Sciences at AUA calling 512592.

If you feel you have not been treated fairly or think you have been hurt by joining this study, please contact Dr. Hripsime Martirosyan, AUA Human Subjects Administrator at 51 25 61.

If you consent to participate, we can start.

Բանավոր համաձայնագիր

Բարև Ձեզ, ես Վահե Բակունցն եմ: Ես Հայաստանի ամերիկյան համալսարանի առողջապահության մագիստրատուրայի և բժշկական համալսարանի ավարտական կուրսի ուսանող եմ: Հայաստանի ամերիկյան համալսարանի հանրային առողջապահության ֆակուլտետը իրականացնում է հետազոտություն, որի նպատակն է բացահայտել երիկամաքարային հիվանդության բուժում ստացած հիվանդների անձնական փորձառությունը երիկամաքարային հիվանդության կանխարգելման գործում:

Դուք ընտրվել եք մասնակցելու այս հետազոտությանը, քանի որ 2009 թվականին հունվարի 1-ից մինչև 2011 հունվարի 1-ը ընկած ժամանակահատվածում Դուք բուժվել եք Միքայելյան Վիրաբուժության Ինստիտուտի Ուրոլոգիայի բաժանմունքում: Ձեր հեռախոսահամարը ձեռք է բերվել բժշկական կենտրոնից:

Եթե Դուք համաձայն եք մասնակցելու այս հետազոտությանը, կլինդրեի պատասխանել մի քանի հարցերի Ձեր հիվանդության պատմության և անհատական կանխարգելիչ միջոցառումների վերաբերյալ: Հարցազրույցը կտևի ոչ ավել քան 15 րոպե:

Ձեր մասնակցությունը այս հետազոտությանը կամավոր է: Դուք իրավունք ունեք չպատասխանել այն հարցին, որոնց հարմար չեք գտնում պատասխանել և նույնիսկ ցանկացած պահի դադարեցնել հարցազրույցը, ինչը Ձեզ վրա կամ Ձեր բուժման վրա որևէ բացասական հետևանք չի ունենա: Դուք կարող եք հարցեր տալ հետազոտության վերաբերյալ: Ձեր մասնակցությունը այս հետազոտությանը որևէ վտանգ չի ներկայացնում Ձեզ համար:

Ձեր կողմից տրամադրված տվյալները կարևոր են հետազոտության համար : Այս հարցազրույցին Ձեր մասնակցությունը չի ենթադրում որևէ ուղղակի շահ Ձեր համար, բայց Ձեր կողմից տրամադրված ինֆորմացիան կարող է օգնել հասկանալու, թե ինչպես ավելի արդյունավետ բուժում տրամադրել մյուս հիվանդներին:

Ձեր կողմից տրամադրված տվյալները գաղտնի են պահվելու և օգտագործվելու են միայն հետազոտության նպատակով: Անանունության սկզբունքը պահպանվելու է, Ձեր անունը չի երևալու հարցաթերթիկի վրա կամ որևէ այլ տեղ: Միայն ամփոփիչ արդյունքներն են ներկայացվելու հետազոտության զեկույցի մեջ: Ձեր հեռախոսահամարը կոչնչացվի տվյալների հավաքագրումից անմիջապես հետո:

Հետազոտության հետ կապված հարցերի համար Դուք կարող եք զանգահարել Հայաստանի ամերիկյան համալսարանի հանրային առողջապահության ֆակուլտետի փոխդեկան Վարդուհի Պետրոսյանին 512592 հեռախոսահամարով: Եթե գտնում եք, որ Ձեզ հետ անարդարացի են վարվել կամ մտածում եք, որ մասնակցությունը վնաս է հասցրել Ձեզ, Դուք կարող եք զանգահարել ՀԱՀ Էթիկայի

Եթե համաձայնեք, կարող ենք սկսել:

Appendix 3

The correct answers of questions from the study questionnaire

Do you think that health experts recommend to consume more, the same amount or less of these foods to prevent KSD?(Check one box per food)			
Food item	More	Less	Not sure
Vegetables	1	0	0
Fruits	1	0	0
Sugary foods	0	1	0
Fish and sea foods	1	0	0
Meat	0	1	0
Greens	1	0	0
Nuts	0	1	0
Salty foods	0	1	0
Water	1	0	0
Fatty foods	0	1	0
Dark chocolate	0	1	0
Spinach	0	1	0
Eggs	1	0	0

In your opinion, which of the mentioned food items are sources of animal proteins? (Check all that apply)

- | | | |
|-------------|---------------|---------------|
| 1. Red meat | 1.Yes 1 point | 2. No 0 point |
| 2. Chicken | 1.Yes 1 point | 2. No 0 point |
| 3. Greens | 1.Yes 0 point | 2. No 1 point |
| 4. Cheese | 1.Yes 1 point | 2. No 0 point |
| 5. Fruit | 1.Yes 0 point | 2. No 1 point |
| 6. Beans | 1.Yes 0 point | 2. No 1 point |

In your opinion, could working in a hot condition/under sun lead to KSD?

- | | | |
|----------------|---------------|------------------------|
| 1. Yes 1 point | 2. No 0 point | 88. Don't know 0 point |
|----------------|---------------|------------------------|

How frequently do you consume the following food items? (Check one box per food)				
Food	Daily	Weekly	Monthly	Never
Milk and milk products (cheese, cottage etc)	0	0	1	1
Eggs	1	1	0	0
Red meat	0	0	1	1
Fish and sea foods	1	1	0	0
Fresh fruits	1	1	0	0
Vegetables	1	1	0	0
Dark chocolate	0	0	1	1
Nuts (almond, walnut, peanut)	0	0	1	1
Tea	0	0	1	1
Salty foods	0	0	1	1
Fatty foods	0	0	1	1
Water - more than 2 liters	1	1	0	0
Spinach	0	0	1	1

What was prescribed by your physician to prevent further development of the kidney stones?

- | | |
|--|---------------------------|
| Alkaline citrates (Blemaren, Uralit-U, Uracit-K) | Yes 1 point
No 0 point |
| Magnesium (Magne-B6) | Yes 1 point
No 0 point |
| Allopurinol | Yes 1 point
No 0 point |
| Phytotherapy (Cyston, Kanephron, Urinex) | Yes 1 point
No 0 point |
| Other | Yes 1 point
No 0 point |

Did you/do you use prescribed medications as they were/are prescribed?

- | | |
|-----------------------------|---------|
| Yes | 1 point |
| No | 0 point |
| Don't know / Don't remember | 0 point |

Appendix 4 STATA OUTPUTS

1. Interaction between knowledge score and marital status

```
regress pr_score kn_score marital1 kn_marital1
```

Source	SS	df	MS		Number of obs =	96
Model	17.866901	3	5.95563366	Prob> F	F(3, 92) =	4.30
Residual	127.372682	92	1.38448568		=	0.0069
					R-squared	= 0.1230
					Adj R-squared	= 0.0944
Total	145.239583	95	1.52883772		Root MSE	= 1.1766

pr_score	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
kn_score	.4619048	.1366732	3.38	0.001	.19046	.7333496
marital1	5.08462	2.416312	2.10	0.038	.2856158	9.883625
kn_marital1	-.3604592	.1604301	-2.25	0.027	-.6790872	-.0418313
_cons	2.438095	2.014141	1.21	0.229	-1.562162	6.438353

```
. lincom kn_score + kn_marital1
```

```
( 1) kn_score + kn_marital1 = 0
```

pr_score	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
(1)	.1014455	.0840133	1.21	0.230	-.0654121	.2683032

2. Interaction between knowledge score and marital status adjusted for gender and duration of the disease

```
regress pr_score kn_score marital1 kn_marital1 gender1 dur_d
```

Source	SS	df	MS		Number of obs =	96
Model	38.8194848	5	7.76389697	Prob> F	F(5, 90) =	6.57
Residual	106.420098	90	1.18244554		=	0.0000
					R-squared	= 0.2673
					Adj R-squared	= 0.2266
Total	145.239583	95	1.52883772		Root MSE	= 1.0874

pr_score	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
kn_score	.4251169	.1268104	3.35	0.001	.173186	.6770478
marital1	4.001094	2.256625	1.77	0.080	-.4820847	8.484273
kn_marital1	-.3080417	.1494047	-2.06	0.042	-.6048602	-.0112232
gender1	-.4818032	.224691	-2.14	0.035	-.928191	-.0354153
dur_d	.050487	.0139975	3.61	0.001	.0226786	.0782955
_cons	3.019236	1.867438	1.62	0.109	-.6907561	6.729229

```
. lincomkn_score+ kn_marit1
```

```
( 1)  kn_score + kn_marit1 = 0
```

```
-----  
pr_score |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]  
-----+-----  
      (1) |   .1170752   .0779987     1.50   0.137    - .0378828   .2720332  
-----
```