

The Impact of the Number of Lifetime Stone Events on Quality of Life: Results From the North American Stone Quality of Life Consortium



S Tapiero,¹ L Limfueco,¹ K Osann,¹ Z Okhunov,¹ RM Patel,¹ R Yoon,¹ JA Antonelli,² NM Streeper,³ KL Penniston,⁴ SY Nakada,⁴ S Sivalingam,⁵ DP Viprakasit,⁶ TD Averch,⁷ T Chi,⁸ VG Bird,⁹ VM Pais,¹⁰ R. Sur,¹¹ S Andonian,¹² NE Canvasser,¹³ BH Chew,¹⁴ RV Clayman¹, J Landman¹

¹University of California, Irvine, CA, ²University of Texas Southwestern Medical Center, Dallas, TX, ³Pennsylvania State University College of Medicine, Hershey, PA, ⁴University of Wisconsin School of Medicine and Public Health, Madison, WI, ⁵Cleveland Clinic, Glickman Urological and Kidney Institute, Cleveland, OH, ⁶University of North Carolina School of Medicine, Chapel Hill, NC, ⁷University of Pittsburgh Medical Center, Pittsburgh, PA, ⁸University of California San Francisco, CA, ⁹University of Florida College of Medicine, Gainesville, FL, ¹⁰Dartmouth Hitchcock Medical Center, Lebanon, NH, ¹¹University of California San Diego, CA, ¹²McGill University Health Center, Montreal, Quebec, Canada, ¹³University of California Davis, Sacramento, CA, ¹⁴University of British Columbia, Vancouver, British Columbia, Canada



INTRODUCTION

Health-related quality of life (HRQOL) is a patient-reported outcome and can serve as an indicator to the medical condition's severity as well as to the effectiveness of treatment. The negative impact of urolithiasis on patients' HRQOL plays a key role in treatment decisions, making HRQOL a principal end point of management. Given the recurrent episodic exacerbations characteristic of stone disease, for many patients urolithiasis is a series of chronic recurring events rather than an acute one-time event. We sought to evaluate the impact of chronic stone recurrence on an individual's HRQOL using the validated Wisconsin Stone Quality of Life (WISQOL) questionnaire.

METHODS

- Patients with urolithiasis from 14 institutions in North America were prospectively enrolled.
- The impact of urolithiasis on patients' HRQOL was evaluated using the validated, disease-specific WISQOL questionnaire.
- WISQOL is comprised of 28 questions using a 1-5 points Likert scale for each item (maximal score is 140) and divided into 4 subdomains (D1-D4): D1 – social functioning, D2 – emotional functioning, D3 – stone related impact, and D4 – vitality.
- Demographic and clinical data, number of stone events, and WISQOL score were recorded.
- Stone event was defined as renal colic, stone-related surgical procedure, or emergency department visit.
- Regression analyses with both univariate and multivariate analyses were performed using general linear models to determine the impact of the number of stone events on HRQOL.

RESULTS

- A total of 2,665 patients were enrolled between 2014 - 2018; 51% were males and the mean age was 54.1±14.4 years.
- The median number of lifetime stone events was 3 (IQR 1-6); 606 patients (23%) had a single stone event.
- Mean total WISQOL score for all patients was 101.5±28.9.
- On univariate analysis, a significant decline in HRQOL was associated with higher number of stone events, younger age, younger age at first stone event, higher BMI, number of comorbidities, female gender, and patients who were not taking thiazide diuretics/urine alkalization medications ($p<0.001$).
- Lowest scores were recorded in symptomatic patients and patients who visited the ED or urgent care within the 4 weeks prior to enrollment (86.2 vs. 121.1 and 84.7 vs. 115.7, respectively, $p<0.001$).
- Using pairwise comparison, the adjusted mean total WISQOL score further declined after **10 stone events**, representing a drop of 6.8 points ($p<0.05$) (Figure 1).
- On multivariate analysis, the number of lifetime stone events was an independent predictor of lower HRQOL; a statistically significant decline (-3.7 points, $p=0.008$) was observed beyond **5 stone events** and was persistent across all 4 subdomains (Table 1).

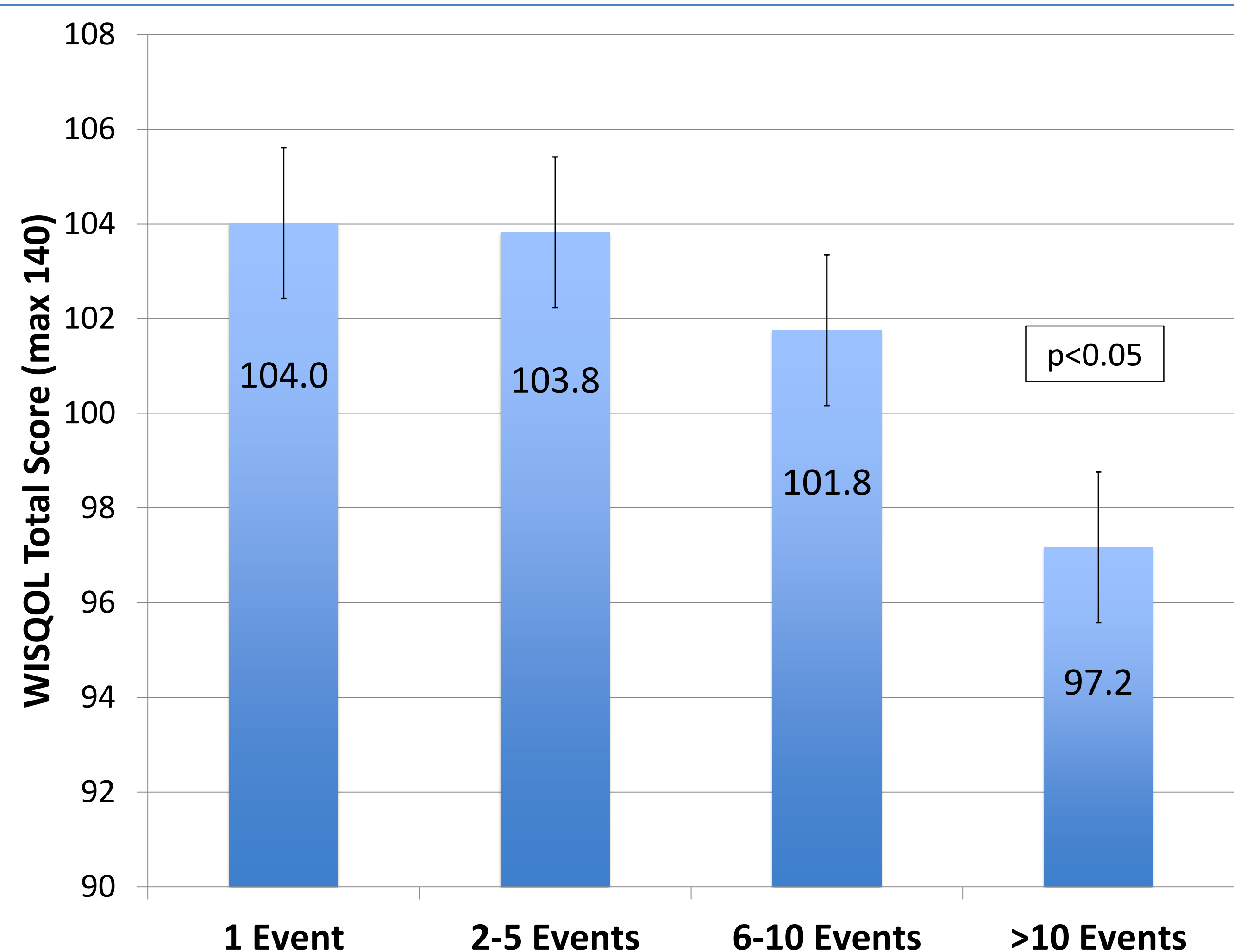


Figure 1: Relationship of WISQOL score with previous stone events

Table 1: Multivariate analysis of WISQOL subdomains and total score

	≤5 stone events	>5 stone events	p value
D1 Social Functioning	70	126	0.004
D2 Emotional Functioning	24.4	23.5	0.009
D3 Stone Related Impact	28.2	27.3	0.011
D4 Vitality	10.0	9.6	0.03
Total Score	102.5	98.8	0.001

CONCLUSIONS

- The cumulative number of lifetime stone events was associated with a lower HRQOL among patients with urolithiasis.
- A significant decline in total WISQOL score and its 4 subdomains was observed beyond 5 stone events.
- These findings underline the importance of strict follow up and prevention strategies among patients with urolithiasis.

