

# REGIONAL DIFFERENCES AND THE IMPACT ON STONE-RELATED QUALITY OF LIFE: RESULTS FROM THE NORTH AMERICAN STONE QUALITY OF LIFE CONSORTIUM



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## INTRODUCTION

The Wisconsin Stone Quality of Life (WISQOL) questionnaire is a validated instrument to evaluate Stone-Related Quality of Life (SRQOL) in patients with kidney stones. Our objective was to assess the correlation between geographical location and SRQOL in the North American Stone Quality of Life Consortium.

## METHODS

- The WISQOL is a 28-question survey that utilizes a Likert-Type Scale (range 0-5) to assess the effect of kidney stones on the following four SRQOL domains:
  - Social Function (8 questions, max score 40).
  - Emotional Function (7 questions, max score 25).
  - Stone-related Impact (8 questions, max score 40).
  - Vitality (3 questions, max score 15).
- Total WISQOL score is calculated by summing all questions (max score 140); this number is used as a quantitative measurement of SRQOL.
- In this study, 2308 patients from 14 institutions were stratified into 4 populations according to the U.S. Census Regions: **West, Midwest, South, and Northeast.**
- Demographic and clinical data, as well as WISQOL domain and total WISQOL scores were analyzed.

## RESULTS

- Populations did not differ by age, gender, number of comorbidities, or age at onset; Otherwise, populations were significantly different demographically and clinically (**Table 1**).
- On WISQOL score analysis, the West exhibited significantly lower SRQOL in each domain (p<0.01) and in total SRQOL (p<0.01) (**Table 2**).
- Upon pairwise analysis, main significant demographic differences in the West include lower Body Mass Index (p<0.01) and more patients with stones at time of the survey (p<0.01).
- When controlling for clinical and demographic covariates through regression analysis:
  - Residing in the West was a significant independent predictor of a lower SRQOL (p<0.001).
  - Residing in the Northeast was a significant independent predictor for a higher SRQOL (p=0.017).

**Table 1:** Comparison of Demographic and Clinical Information by Geographical Population.

Variables	West (n=607)	Midwest (n=433)	South (n=612)	Northeast (n=656)	p
<b>Average Age</b>	53.4±14.7	54.2±14.5	53.8±14.4	52.7±14.0	0.2
<b>Gender</b>					
- Male	329 (54%)	217 (50%)	325 (53%)	313 (48%)	0.09
- Female	278 (46%)	216 (50%)	287 (47%)	343 (52%)	
<b>Ethnicity</b>					
- African American	13 (2%)	13 (3%)	29 (5%)	13 (2%)	<0.01
- Asian	87 (14%)	6 (1%)	11 (2%)	11 (2%)	
- Hispanic/Latino	56 (9%)	5 (1%)	38 (6%)	22(3%)	
- White	400 (66%)	400 (92%)	511 (84%)	601(92%)	
- Other	26 (4%)	2 (0.5%)	8 (1%)	9 (1%)	
<b>Employment status</b>					
- Employed	370 (61%)	244 (56%)	345 (56%)	496 (75%)	<0.01
- Retired/Unemployed	210 (35%)	151 (35%)	256 (42%)	146 (22%)	
<b>Average number of Comorbidities</b>	1.7±1.6	1.9±1.7	1.8±1.6	1.9±1.9	0.05
<b>Patients with Metabolic Syndrome</b>	27 (4%)	19 (4%)	39 (6%)	29 (4%)	0.3
<b>Average BMI (kg/m<sup>2</sup>)</b>	28.5±6.8	30.5±7.5	30.5±7.4	30.7±7.8	<0.01
<b>Average Age at Onset</b>	41.0±16.9	43.2±16.1	40.5±16.2	39.3±15.8	0.07
<b># of stone events</b>					
- One	154 (25%)	92 (21%)	155 (25%)	111 (17%)	<0.01
- Multiple	382 (63%)	259 (60%)	428 (70%)	416 (63%)	
<b>History of stone removal surgery</b>					
- Yes	381 (63%)	283 (65%)	439 (72%)	478 (73%)	<0.01
- No	226 (37%)	150 (35%)	173 (28%)	178 (27%)	
<b>With stones during survey</b>					
- No	131 (22%)	137 (32%)	148(24%)	191(29%)	<0.01
- Yes	366 (60%)	221 (51%)	335 (55%)	321 (49%)	
<b>Symptomatic at time of survey</b>					
- No	300 (49%)	264 (61%)	318 (52%)	395 (60%)	<0.01
- Yes	242 (40%)	140 (32%)	249 (41%)	211 (32%)	

## RESULTS

**Table 2:** Domain and Total WISQOL score by Geographical Population.

Variables	West (n=607)	Midwest (n=433)	South (n=612)	Northeast (n=656)	p	Total (n=2308)
Social Function	34 (21-40)	38 (31-40)	37 (28-40)	39 (32-40)	p<0.01	37 (28-40)
Emotional Function	23 (14-31)	29 (21-34)	28 (18-34)	30 (23-34)	p<0.01	28 (19-34)
Stone related Impact	28 (18-36)	32 (25-38)	31 (21-37)	34 (25-39)	p<0.01	31 (22-38)
Vitality	10 (6-14)	12 (9-15)	11 (7-14)	12 (8-15)	p<0.01	11 (7-15)
<b>Total WISQOL score</b>	<b>103 (69-125)</b>	<b>120 (93-133)</b>	<b>113 (81-132)</b>	<b>122.5 (99-134)</b>	<b>p&lt;0.01</b>	<b>115 (86-131)</b>

## CONCLUSIONS

In conclusion, using the Wisconsin Quality of Life questionnaire, we found that geographical region was an independent variable with regard to the impact of urolithiasis on quality of life. People living in the West were most affected, whereas individuals residing in the Northeast were least affected.