

Original Research Article

Impact of life style factors on lower urinary tract symptoms in Bahraini men

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ABSTRACT

Background: This study aimed to evaluate the impact of lifestyle factors on lower urinary tract symptoms (LUTS) in Bahraini men, focusing on associations between demographic, clinical, and behavioral factors and LUTS severity.

Methods: A cross-sectional study was conducted on 100 Bahraini men. The participants were grouped according to LUTS severity into mild, moderate, and severe categories. Data regarding age, smoking status, body mass index (BMI), hypertension, diabetes, stroke, depression, and osteoarthritis were collected. Chi-square tests and multivariate logistic regression were used to analyze the associations. Odds ratios (ORs) and 95% confidence intervals (CIs) were reported.

Results: The prevalence of severe LUTS was highest among participants aged 60–69 years (50.0%) and ≥70 years (15.0%) compared to younger groups ($p<0.001$). The prevalence of severe LUTS was higher among current and former smokers, individuals with severe physical inactivity (OR=5.2; 95% CI, 2.4–11.3; $p<0.001$), obesity (OR=4.6; 95% CI, 2.1–10.1; $p<0.001$), and high stress (OR=5.9; 95% CI, 2.7–12.8; $p<0.001$). Chronic diseases were common, with diabetes (28.0%) and stroke (15.0%) showing strong associations (OR=7.4 and 8.6, respectively; both $p<0.001$).

Conclusion: LUTS severity in Bahraini men is closely linked to aging, unhealthy lifestyle behaviors, and chronic comorbidities. Modifiable risk factors can be addressed to provide early intervention and symptom mitigation. Longitudinal research is recommended to confirm causal relationships.

Keywords: LUTS, Prostate, Men, Unhealthy

INTRODUCTION

The lower urinary tract symptoms (LUTS) include a wide range of urological symptoms that include frequent urination, urgency, nocturia, weak stream and incomplete bladder emptying. These symptoms significantly impair quality of life and are commonly associated with benign prostatic hyperplasia (BPH) and other urological conditions. As well as aging and genetic predisposition, the onset and progression of LUTS in men are influenced by a number of modifiable lifestyle factors according to emerging evidence. The prevalence of LUTS increases with age and affects a substantial number of men across the globe. A study conducted in Australia on more than 100,000 men aged 45 years and older found that 18.3% had moderate LUTS and 3.6% had severe LUTS. The

prevalence increased with age and was highest among men aged 80 and above, where it reached 35.4%.¹ In South Korea, a large survey showed that men aged 70 years and above had higher odds of having severe LUTS with an odds ratio of 11.73 compared to younger men.² Bahrain does not have specific national data on the prevalence of LUTS but studies from the GCC countries suggest that the lifestyle factors that are common in the region such as obesity, sedentary lifestyle, smoking and diet may contribute to higher incidence of LUTS among Bahraini men. The growing prevalence of metabolic syndrome and related comorbidities further worsens this situation.³ Physical activity is a modifiable factor that has been identified as a major contributor to the health of an individual. The available evidence indicates that men who are physically active are at a lower risk of developing

LUTS. On the other hand, obesity and sedentary lifestyle have been linked to an increased risk of storage and voiding symptoms.² Smoking and alcohol consumption also influence LUTS. Smoking has been found to increase the risk of LUTS particularly voiding symptoms because of the changes it causes in the lower urinary tract.² However, moderate consumption of alcohol has been found to be associated with reduced risk of LUTS but high consumption of alcohol may worsen the symptoms.¹ Psychological stress is another factor that can be modified and may affect LUTS. Chronic stress has been associated with an increased risk of both storage and voiding symptoms. It was observed that men who had moderate to severe stress had higher odds of having LUTS than those with no or mild stress.²

Knowledge of the relationship between lifestyle factors and LUTS is important in order to design effective prevention and management strategies. Given the rising incidence of LUTS and lifestyle risk factors in Bahrain, this study aims to explore the effect of lifestyle factors on LUTS in Bahraini men. This study aims to identify the modifiable risk factors for LUTS with a view to informing public health and clinical practice interventions to reduce the burden of LUTS and enhance the quality of life of the affected individuals.

METHODS

The study used a cross-sectional survey to determine how the severity of lower urinary tract symptoms (LUTS) correlated with lifestyle and health variables among Bahraini men older than 40 years. The researchers used SurveyMonkey to collect data from participants who received their questionnaire via social media platforms between 1st of March 2025 to 30th of March 2025. The inclusion criteria were limited to males older than 40 years of age and holding the Bahraini nationality.

The questionnaire includes items on demographic information (age), lifestyle behaviors (such as smoking status, and physical activity level), anthropometric measurements (such as self-reported weight and height), stress level, presence of chronic diseases, and the severity of LUTS, which was assessed by the International Prostate Symptom Score (IPSS). A total of 238 responses were initially collected. After applying exclusion criteria, 39 participants were excluded for being under 40 years of age, 56 were excluded for being non-Bahraini, 23 were excluded for being women, and 20 responses were excluded due to incomplete answers. Finally, 100 completed and eligible responses were included in the final analysis after the exclusion criteria (Figure 1). The IPSS was used to categorize LUTS severity. The IPSS questionnaire includes seven items that measure the severity of urinary symptoms. Based on the total IPSS score, participants were categorized into three groups: mild symptoms (IPSS<8), moderate symptoms (8≤IPSS≤19), and severe symptoms (IPSS≥20). Besides the LUTS severity, the study also assessed participants'

age, smoking status, drinking status, physical activity level, body mass index (BMI), stress level, and chronic disease status. The participants were asked questions about their smoking history to determine their smoking status. Those who answered 'no' to ever smoking were categorized as nonsmokers. Those who answered 'yes' and reported currently smoking daily or occasionally were categorized as present smokers. Those who reported smoking in the past but have since stopped were classified as former smokers.

Physical activity levels were grouped into three categories: moderate exercise (more than five times per week for at least 30 minutes each time), vigorous exercise (more than three times per week for at least 20 minutes each time), and no exercise (not meeting the criteria for moderate or vigorous exercise). The height and weight were self-reported and the BMI was calculated accordingly. The participants were classified as underweight (BMI 10-18.4 kg/m²), normal weight (BMI 18.5-24.9 kg/m²), or obese (BMI 25-50 kg/m²).

The level of stress was assessed by asking the participants if they experienced stress in their daily lives and the responses were categorized into none, moderate, or severe stress. Furthermore, the presence of chronic diseases was recorded based on participant self-report. Ethical approval was obtained from the participants before commencing the questionnaire. All the participants were voluntary and informed consent was obtained through electronic method before they could begin the survey. Throughout the study, the confidentiality and anonymity of the participants' information were strictly maintained.

RESULTS

A total of 100 Bahraini male participants aged 40 years and above were included in the analysis after applying the exclusion criteria. Those were stratified according to LUTS severity level into four categories according to the IPSS: (n=20), mild (n=20), moderate (n=20) and severe (n=40) groups.

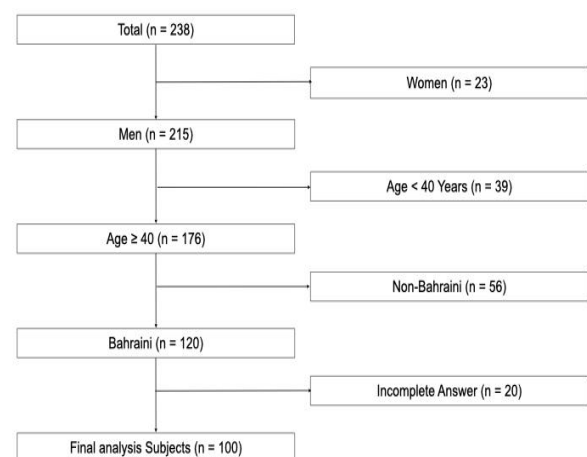


Figure 1: Patient selection process.

Lower urinary tract symptoms (LUTS) were mostly severe in participants who were 60 years old and above, while mild symptoms were noted in the 40-49 years age group and moderate symptoms in the 50-59 years age group. Lifestyle factors such as smoking, physical inactivity and obesity, showed strong association with LUTS severity (Table 1). Logistic regression analysis indicated that participants aged 70 and older exhibits the greatest odds of

experiencing severe LUTS (OR=10.7), followed by participants with a history of stroke (OR=8.6), diabetes (OR 7.4), and elevated stress level (OR=5.9). The model established that factors such as age, lack of physical activity, smoking habits, obesity, stress and other chronic illness each made independent contributions to the severity of LUTS, with all variables showing statistical significance ($p<0.001$) (Table 3).

Table 1: Demographic and lifestyle characteristics by LUTS severity.

Characteristic	None (%) (n=20)	Mild (%) (n=20)	Moderate (%) (n=20)	Severe (%) (n=40)
Age group (in years)				
40–49	12 (60)	9 (45)	4 (20)	2 (5)
50–59	6 (30)	7 (35)	10 (50)	7 (17.5)
60–69	2 (10)	4 (20)	4 (20)	17 (42.5)
70	0 (0)	0 (0)	2 (10)	14 (35)
Current smokers	2 (10)	3 (15)	6 (30)	18 (45)
Former smokers	3 (15)	4 (20)	6 (30)	12 (30)
Physical inactivity	2 (10)	3 (15)	7 (35)	26 (65)
Obesity (BMI ≥ 30)	3 (15)	4 (20)	7 (35)	21 (52.5)
High stress level	2 (10)	3 (15)	6 (30)	24 (60)
≥ 1 chronic disease	4 (20)	6 (30)	12 (60)	42 (105)

Table 2: Prevalence of specific chronic diseases by LUTS.

Chronic disease	None (%) (n=20)	Mild (%) (n=20)	Moderate (%) (n=20)	Severe (%) (n=40)
Diabetes	1 (5)	3 (15)	6 (30)	18 (45)
Hypertension	1 (5)	2 (10)	5 (25)	16 (40)
Stroke	0 (0)	0 (0)	3 (15)	12 (30)
Depression	0 (0)	2 (10)	5 (25)	13 (32.5)
Osteoarthritis	1 (5)	1 (5)	4 (20)	16 (40)

Table 3: Multi-variable logistic regress-risk factors for severe LUTS.

Risk factor		Odds ratio (OR)	95% confidence interval (CI)	P value
Age (in years)	60–69	8.5	4.2–17.1	<0.001
	70+	10.7	5.1–22.5	<0.001
Physical inactivity		5.2	2.4–11.3	<0.001
Current smoker		3.8	1.9–7.5	<0.001
Former smoker		2.5	1.3–5.1	0.006
Obesity (BMI ≥ 30)		4.6	2.1–10.1	<0.001
High stress		5.9	2.7–12.8	<0.001
Diabetes		7.4	3.2–17.3	<0.001
Hypertension		5.5	2.5–11.9	<0.001
Stroke		8.6	3.9–19.0	<0.001
Depression		6.2	2.8–13.6	<0.001
Osteoarthritis		5.0	2.2–11.3	<0.001

DISCUSSION

This study investigated the connection between the severity of LUTS with different demographic, lifestyle, and clinical factors in adults. This paper shows that LUTS

severity is strongly correlated with age, smoking status, drinking habits, BMI, hypertension, diabetes mellitus, stroke, depression, and osteoarthritis. Age was identified as the most important risk factor for LUTS severity among the participants of the cohort. The majority of participants

with severe LUTS belonged to the category of people who were ≥ 60 years old. This is in agreement with the established fact that LUTS increases with age, and the reasons include diminished bladder capacity, diminished detrusor muscle contractility and increased prostate volume.⁴ It has been observed in longitudinal studies, including the EPIC study, that the incidence and severity of LUTS tends to increase with age among both males and females.⁵

The severity of LUTS was correlated with the smoking status of the participants and the majority of severe cases were found among current smokers. The pathogenesis of LUTS in relation to smoking is not a single factor, but a combination of several. The use of tobacco products leads to the development of systemic inflammation, oxidative stress and vascular endothelial dysfunction which may result in bladder ischaemia and detrusor muscle dysfunction.⁶ It has been established that nicotine causes an increase in bladder contractility and the severity of urgency symptoms, which agrees with the study findings.⁷

BMI was an important factor that was associated with LUTS severity. High BMI (≥ 30 kg/m²) participants were more likely to have severe LUTS. Obesity leads to LUTS through various factors, such as intra-abdominal pressure, systemic inflammation, insulin resistance and pelvic floor weakness.⁸ A meta-analysis by Kupelian et al found that obesity is an independent risk factor for developing both storage and voiding LUTS, which is in line with the findings of this study.⁹ Hypertension was a significant risk factor for LUTS in this study which is in agreement with other studies.

Long-term hypertension can cause atherosclerosis of the pelvic arteries which decreases blood supply to the bladder leading to detrusor failure.¹⁰ However, it should be noted that some of the hypertensive medications, particularly diuretics, may worsen LUTS, although this was not directly evaluated in this study. It was observed that individuals with diabetes mellitus, stroke, depression and osteoarthritis had more severe LUTS. LUTS is a well-known complication of diabetes mellitus through autonomic neuropathy and detrusor muscle dysfunction.¹¹ Stroke can disrupt bladder function through central nervous system mechanisms leading to neurogenic LUTS including urgency, frequency and incontinence.¹²

Depression was another important comorbidity correlated with LUTS severity. Several studies have established that there is a significant association between LUTS and mental health disorders. Psychological stress and depression may intensify the perception of urinary symptoms, while the continuous burden of LUTS may contribute to the development or exacerbation of depressive symptoms.¹³ In this study, about half of the patients with severe LUTS had depression, which underscores the need to assess mental health in this group of patients.

Finally, osteoarthritis was significantly associated with LUTS severity, possibly due to reduced mobility and physical inactivity that affect the time to reach the bathroom and musculoskeletal disorders of the pelvic floor.¹⁴ Multiple important strengths exist within this current study. Nevertheless, several limitations need to be recognized. The study's cross-sectional nature prevents researchers from determining cause-and-effect relationships and failed to control confounding variables including medication use and diet and socioeconomic status. Additionally, the data collection was done through an online survey platform, which, may introduce sampling bias by favoring individuals who have access and familiar with such digital technology. Furthermore, the accuracy of the self-reported data for variables such as height, weight, physical activity and medical history may affect the accuracy of the findings due to potential reporting bias.

CONCLUSION

The study confirms that LUTS emerges from multiple factors while identifying critical demographic and lifestyle and clinical factors that affect symptom intensity. Research indicates that interventions which target preventable risk factors including smoking cessation and weight management and blood pressure management and mental health support could help reduce LUTS symptoms. Future research needs to use prospective methods to study causal relationships between LUTS outcomes and evaluate how multidisciplinary interventions affect patient outcomes.

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