

# Comprehensive Assessment of Male Lower Urinary Tract Symptoms at a Tertiary Care Urology Clinic: A Prospective Study

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## Abstract

### Introduction

Lower Urinary Tract Symptoms (LUTS) greatly affect men's quality of life, often resulting from benign prostatic obstruction. Therefore, this study is aimed to assess the severity of LUTS associated with demographic and clinical factors. There is potential for tailored care and public health strategies to alleviate the burden of male LUTS (mLUTS).

### Methods

A one-year prospective cross-sectional study at a urological clinic in a tertiary care center collected data from male patients through self-reported questionnaires and investigator interviews regarding Lower Urinary Tract Symptoms and International Prostate Symptoms Score (IPSS). Statistical analysis was performed using SPSS, employing descriptive statistics and the Chi-square test, with significance defined as  $P < 0.05$ .

### Results

The total of 181 male patients participated in this study with the mean age of 66.65 years. The majority (80.7%) were over 60, showing a mean IPSS score of  $21.06 \pm 7.8$ . BMI analysis revealed 58.6% normal and 41.4% overweight/obese, with distinct IPSS scores. Occupation significantly linked to LUTS severity ( $p=0.002$ ), distinguishing employed and retired individuals. Diabetes ( $p=0.047$ ) and alcohol consumption ( $p=0.034$ ) were significantly associated with LUTS severity. 44.2% had equally dominant voiding and storage symptoms, and 52.5% underwent surgical interventions, TURP being the most common (30.9%). Moderate and severe LUTS were linked to a poor quality of life ( $p=0.0001$ ).

### Conclusions

mLUTS is associated with rising age (more mLUTS in  $>60$  years), obesity/ over weight, Diabetes and Alcohol consumption. The majority that had moderated LUTS (IPSS) study on individuals over 60 found occupation, diabetes, and alcohol consumption linked to severe Lower Urinary Tract Symptoms (LUTS). Coexistence of voiding and storage symptoms underscored complexity. Higher rates of medical interventions, notably Transurethral Resection of the Prostate, emphasized clinical impact and management challenges in this demographic.

### Introduction


Lower Urinary Tract Symptoms (LUTS) include a broad spectrum of clinical presentations that greatly affect the quality of life (QoL). These symptoms include voiding LUTS (weak stream, hesitancy, straining, interrupted flow, terminal dripping and feeling incomplete emptying) and storage LUTS (frequency, urgency, nocturia, nocturnal enuresis and urge incontinence) [1]. The prevalence of moderate to severe LUTS in men vary from 16.2% to 25.1%, with the incidence of mLUTS rising due to prostate enlargement as men age. Over half the men in their 60s and up to 90% of men over 80 experience some form of LUTS, leading to a significant decline in their quality of life (QoL) [1,2]. While male LUTS is caused by benign prostatic obstruction (BPO), urinary tract infection (UTI), urethral stricture bladder stone, prostate cancer and detrusor muscle dysfunction (detrusor under activity and detrusor muscle over activity) could also give rise to similar symptoms also known as over active bladder (OAB). [3].

Therefore, understanding the multifaceted nature of mLUTS, including its prevalence, severity, and associated factors, is crucial for informed clinical management.

The significance of this research lies in its potential to enhance the diagnostic and therapeutic approaches to LUTS, tailoring comprehensive understanding to the specific needs of individual patients. Furthermore, the findings may contribute to the development of targeted prevention strategies and healthcare policies aimed at reducing the burden of LUTS in

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the male population.

Therefore, the study aimed to assess the severity of mLUTS and investigate the related demographics and clinical characteristics in male patients admitted to the urological clinic at a tertiary care center.

### Methods

This prospective cross-sectional study was conducted over one year starting in September 2022 at a urological clinic at Teaching Hospital, Jaffna, Sri Lanka, following ethical approval from the Institutional Ethical Review Committee. All participants voluntarily consented and provided written informed consent. Male patients who visited the urological clinic at the tertiary care center and were able to complete the LUTS and IPSS questionnaires were included in the study.

Data were collected using a validated, interviewer-administered LUTS questionnaire and the International Prostate Symptoms Score (IPSS) questionnaire. The LUTS questionnaire gathered information on patients' demographic and clinical characteristics, while the IPSS questionnaire contained seven questions about LUTS (incomplete emptying, frequency, intermittency, urgency, weak urinary stream, hesitancy, and nocturia) and one question about quality of life (QoL). Each symptom's severity was rated on a scale of 0-5 (0, not at all; 1, less than one time in five; 2, less than half the time; 3, about half the time; 4, more than half the time; and 5, almost always during the preceding month). The total symptom score, ranging from 0 to 35, was calculated by

summing the scores for the seven symptoms. These scores were then categorized into three severity levels: "mild" (0-7), "moderate" (8-19), and "severe" (20-35). The QoL question assessed the overall discomfort caused by urinary symptoms, scored from 0 to 6 (0, delighted; 1, pleased; 2, mostly satisfied; 3, about equally satisfied and dissatisfied; 4, mostly dissatisfied; 5, unhappy; and 6, terrible).

Statistical analyses were performed using SPSS version 21. Descriptive statistics included mean and standard deviation for numerical variables, and frequencies and percentages for categorical variables. The Chi-square test was used to assess significance, with a P-value of  $\leq 0.05$  indicating statistical significance.

### Results

A total of 181 male patients participated in this study, with a mean age of 66.65 years (SD: 8.6) and a BMI of 24.4 kgm<sup>-2</sup> (SD: 4.0). The majority (80.7%) were over 60 years old, with a mean IPSS score of 21.06  $\pm$  7.8. Body Mass Index (BMI) analysis revealed 58.6% in the normal range and 41.4% classified as overweight or obese, each group displaying distinct IPSS scores.

Education primarily involved primary and secondary levels (89.5%), with 10.5% pursuing higher studies. Working status, a mix of active workers and retirees, showed notable differences in mean IPSS scores. Comorbidities included diabetes mellitus (DM) (38.1%), hypertension (HT) (42%), hyperlipidaemia (HL) (28.7%), and chronic kidney disease

**Table 1:** LUTS severity across baseline characteristics with corresponding p-values

	Details	LUTS severity (n)			P value (Chi square)
		Mild	Moderate	Severe	
Age	<60	1	14	20	0.065
	>60	19	71	56	
Education	primary & secondary	20	73	69	0.160
	higher	0	12	7	
Occupation	Employed	10	53	66	0.002
	Retirees	10	32	10	
DM	No	11	46	55	0.047
	Yes	9	39	21	
HT	No	6	38	32	0.487
	Yes	14	47	44	
HL	No	17	63	49	0.143
	Yes	3	22	27	
CKD	No	19	76	72	0.401
	Yes	1	9	4	
BMI	Normal	13	56	37	0.072
	Overweight & obese	7	29	39	
Consumes alcohol	No	11	30	16	0.034
	Yes	9	55	60	
Exercise	No	7	23	12	0.213
	Yes	13	62	64	
Smoking status	Non/ former smoker	14	67	47	0.058
	Smoker	6	18	29	
Quality of Life	Good	17	66	27	0.0001
	Poor	3	19	49	

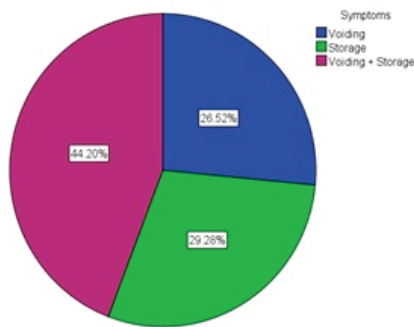
(CKD) (7.7%). Males with more severe LUTS complained poor QOL score as expected.

Individuals over 60 showed a trend towards higher LUTS prevalence ( $p=0.065$ ), while occupation exhibited a significant link ( $p=0.002$ ), distinguishing LUTS severity between employed and retired individuals. Diabetes ( $p=0.047$ ) and alcohol consumption ( $p=0.034$ ) were significantly associated, implying potential roles in LUTS severity. A similar trends were observed with BMI ( $p=0.072$ ) and smoking ( $p=0.058$ ). LUTS severity across demographics with corresponding p-values demonstrated in Table 1.

Around 44.2% had equally dominant voiding and storage symptoms whereas 29.3% of patients had predominant storage symptoms and 26.5% experienced predominant voiding symptoms (Figure 1). The majority had moderate LUTS (47%) followed by severe (42%) LUTS.

Benign Prostatic Occlusion (BPO) was the most common underlying aetiology (73.5%) (Table 2).

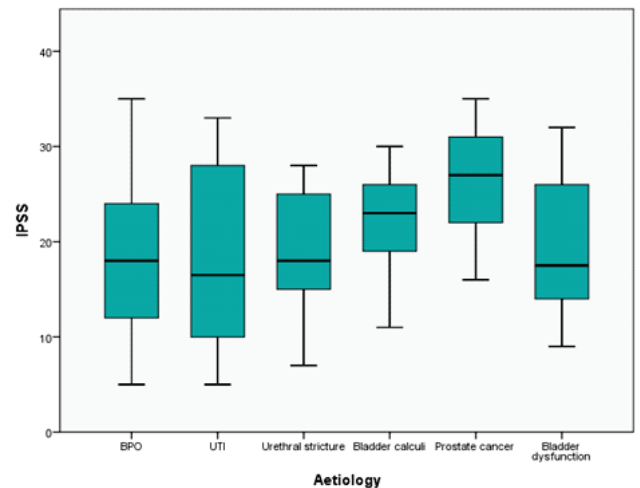
Patients presented with prostate cancer had severe IPSS scores. Patients who presented with bladder calculi also had severity in LUTS. UTI presented with wide distribution of severity (Figure 2).



**Figure 1.** Distributions of LUTS symptoms

**Table 2.** Distribution of aetiology

Aetiology	Frequency	Percentage
Benign Prostatic Occlusion - BPO	133	73.5%
Urinary tract infections - UTI	14	7.7%
Bladder calculi	9	5.0%
Urethral stricture	8	4.4%
Prostate cancer	7	3.9%
Bladder dysfunction	10	5.5%



**Figure 2.** Diverse patterns of IPSS among the etiological groups.

Approximately 52.5% of cases were treated through pharmacological interventions such as tamsulosin, finasteride, anticholinergics, antibiotics and lifestyle modifications. While 47.5% underwent surgical management during the period. Transurethral Resection of the Prostate (TURP) was the most frequently performed surgical procedure, accounting for 30.9% of cases followed by bladder neck incision/ bladder neck resection (BNI/BNR) (5.5%) (Table 3).

### Discussion

Assessment of LUTS is crucial for accurate diagnosis and treatment for medical practitioners especially in men. The IPSS questionnaire is widely used as a symptom assessment tool, although it was initially designed to evaluate symptoms of BPO [5]. This study focused on assessing lower urinary tract symptoms (LUTS) in male patients.

The prevalence of LUTS tends to increase with age and is often associated with BPO [5,6,13]. The majority of participants were elderly, with a mean age of 66.65 years, and over 60 years old, correlating with a higher LUTS prevalence ( $p=0.065$ ) and a mean IPSS score of  $21.06 \pm 7.8$ .

**Table 3.** Clinical characteristics of the study participants

Management	Total (n= 181)	%
<b>Medical management</b>	95	52.5%
<b>Surgical management</b>	86	47.5%
Urethral dilation/optical urethrotomy	8	4.4%
TURP	56	30.9%
Bladder neck incision/ bladder neck resection (BNI/BNR)	10	5.5%
Cystolitholapaxy	7	3.9%
Radical/partial prostatectomy	4	2.2%

Educational and occupational factors demonstrated associations with LUTS presentation [13]. Those with primary/secondary education had a mean IPSS score of  $18.75 \pm 8.4$ , while higher education correlated with a slightly lower score of  $18 \pm 7.1$ . Active workers exhibited a higher mean IPSS score ( $20.30 \pm 8.0$ ) than retirees ( $14.63 \pm 7.5$ ), with retirees reporting a higher LUTS prevalence, possibly due to age. Significant associations were found between LUTS severity and occupation ( $p=0.002$ ), diabetes ( $p=0.047$ ), and alcohol consumption ( $p=0.034$ ). These findings emphasize the impact of socioeconomic and lifestyle factors on LUTS, contributing valuable insights.

Obesity is linked to a higher risk of LUTS, while lack of physical activity may allow LUTS to progress in men of normal weight [7]. This study revealed that individuals classified as overweight or obese (41.4%) exhibited a higher mean IPSS score of  $21.05 \pm 8.4$  compared to those within the normal BMI range ( $16.99 \pm 7.8$ ). Regular exercise demonstrated a protective effect, with a significant p-value indicating lower health risks, while the impact of alcohol and smoking exhibited variability, highlighting the multifaceted nature of lifestyle influences on health. This finding suggests a potential relationship between weight status and the manifestation of LUTS, emphasizing the complexity of lifestyle factors in clinical contexts. It is well known that alcohol, smoking, fizzy drinks and caffeine intake affect detrusor function (over active bladder) and give rise to storage LUTS.[7]

The prevalence of comorbidities, including diabetes mellitus (38.1%), hypertension (42%), hyperlipidaemia (28.7%), and chronic kidney disease (CKD) (7.7%), added a layer of complexity to the clinical picture. Older individuals, especially those over 60, showed higher rates of moderate to severe health issues. This is aligned with a global study which assessed relationship between the co-morbidities and mLUTS [14].

Several previous studies have reported isolated storage LUTS as the most frequent subtype, while the mixed subtype was predominant in this study [9,13]. The mixture of voiding and storage LUTS was found to be directly associated with BMI. Considering that BPO was the most common aetiology in our study, voiding LUTS should theoretically predominate the clinical profile. However, the prevalence of mixed LUTS suggests the influence of secondary pathologies and associated medical conditions. Glasser, D B et al has claimed voiding symptoms as the predominant LUTS subtype [9]. The prevalence of moderate (47%) and severe (47%). LUTS in this study rather mild LUTS further accentuated the

significance of addressing and assessing the severity of clinical setting.

Symmetric distributions of LUTS score are noted in benign prostatic obstruction (BPO) and bladder calculi. Prostate cancer exhibited a negatively skewed distribution, indicating a subgroup with notably severe symptoms. This may be explained by as prostate cancer cause more rigid prostate enlargement rather than benign prostate enlargement cause which is more responsive for medical therapy such as Tamsulosin (Alpha blockers) and Finasteride (5 alpha reductase inhibitors). Urinary tract infection UTI, and bladder dysfunction displayed wider interquartile ranges, suggesting varied severity within these categories.

Moderate and severe LUTS significantly linked to poor QoL in men. NICE guidelines indicated 30% of men over 65 experience troublesome urinary symptoms [16]. Another study reported a 59.1% prevalence of LUTS, with 25.5% experiencing poor QoL [17]. The current study also underscored the impact of LUTS on QoL, revealing that moderate and severe symptoms are significantly associated with poor QoL. The findings underscore the importance of considering QoL in the context of lower urinary tract symptoms, highlighting potential implications for healthcare interventions and emphasizing the need for a comprehensive approach to improve both aspects of well-being.

When medical treatment fails, surgical procedures like TURP are considered which the gold standard approach for BPO and it is a minimally invasive procedure [15]. Our study identified that 30.9% of individuals were treated with TURP for BPO. The diversity in surgical interventions, including urethral dilation/optical urethrotomy, bladder neck incision/bladder neck resection cystolitholapaxy, and radical/simple prostatectomy, reflects the individualized approach required in addressing the diverse aetiologies of LUTS.

## Conclusion

Most of the participants with LUTS were above 60 years of age. Occupation, diabetes, growing older and alcohol consumption were identified as key factors associated with LUTS severity. The coexistence of voiding and storage symptoms highlighted the complexity of LUTS presentations. Majority of our study participant had equally dominant voiding and storage symptoms. Severity of LUTS was associated with poor QoL. A high rate of surgical interventions, especially TURP, emphasized the clinical impact and management challenges of LUTS in this demographic with possible late presentation to hospital to hospital. Patients presented with prostate cancer had severe

IPSS scores. UTI and bladder dysfunction were presented with wide distribution of LUTS severity

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