

## Original Article

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### **Spectrum of male lower urinary tract symptoms and erectile dysfunction at a tertiary care urology clinic: A prospective study.**

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#### **Abstract**

##### **Introduction**

Lower Urinary Tract Symptoms (LUTS) significantly impact men's quality of life, often due to benign prostatic occlusion. Erectile dysfunction (ED) is also linked to LUTS. Therefore, the study was aimed to assess the severity of LUTS associated with demographic and clinical factors and ED, which is potential for tailored care and public health strategies to alleviate the burden on male patients.

##### **Methods**

This prospective cross-sectional study was conducted at a urological clinic in Teaching Hospital, Jaffna, for one-year, after obtained ethical approval. It involved male married patients who completed questionnaires on Lower Urinary Tract Symptoms (LUTS), International Prostate Symptoms Score (IPSS), and International Index of Erectile Function (IIEF), excluding those with catheters other penile pathologies. The study gathered demographic and clinical data through LUTS questionnaire, assessed LUTS severity using the IPSS scale and also considered quality of life (QoL) in relation to urinary symptoms. The IIEF questionnaire addressed erectile dysfunction. Data accuracy was ensured through patient self-reports and investigator interviews. Statistical analyses employed SPSS and included descriptive statistics and Pearson correlation. Multiple linear regression to explore the relationship between independent and the dependent variables.

##### **Results**

Among the 181 male participants, mean age and BMI were  $66.5 \pm 8.6$  years and  $24.4 \pm 4 \text{ kgm}^{-2}$  respectively. The majority exhibited moderate to severe LUTS, primarily attributed to Benign Prostatic Occlusion (BPO). Erectile Dysfunction (ED) was prevalent in 28.7% of LUTS patients.

With increasing in age and severity of LUTS degree of ED was higher. Pearson correlation analysis showed a positive correlation between LUTS severity and ED, QoL before treatment, but not after. Multiple linear regression revealed that age, occupation, and BMI significantly influenced LUTS severity, with age showing a marginal negative association, while occupation and QoL had significant positive effects. The degree of ED was highly correlated with diabetes mellitus (DM), Ischaemic heart disease (IHD) and hypertension (HT).

## Conclusion

LUTS were common among men over 40. Benign Prostatic Occlusion (BPO) was a common cause, and nearly 29% of LUTS patients had Erectile Dysfunction (ED). Age, occupation, and Quality of Life (QoL) significantly influenced LUTS and ED severity. Severe LUTS associated with higher prevalence of ED. Severity of ED was associated with higher IPSS score and age. ED was highly correlated with Metabolic syndrome and severity of LUTS.

**Keywords:** Lower urinary tract symptoms, International prostate symptoms score, Quality of life, Erectile dysfunction

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## Introduction:

Lower Urinary Tract Symptoms (LUTS) significantly affect quality of life (QoL), with symptoms such as urgency, frequency, hesitancy, weak stream, nocturia, and incomplete emptying (1). The prevalence of moderate to severe LUTS in men ranges from 16.2% to 25.1%, increasing with age and reducing QoL (2). One primary cause of male LUTS is benign prostatic occlusion (BPO) (3), making thorough investigation crucial for improving diagnosis and treatment.

Erectile dysfunction (ED) is also common, adding to physical and psychological distress (4). Understanding the connection between LUTS and ED is key to advancing male urological health. This study aims to evaluate the severity of LUTS, associated demographics, clinical characteristics, and ED in male patients admitted to a urological clinic at a tertiary care centre.

## Methods:

This prospective cross-sectional study was conducted over a year at Teaching Hospital, Jaffna, after approval from the Institutional Ethical Review Committee. Participants provided written informed consent.

The study included male patients admitted to the urological clinic who completed the LUTS, IPSS, and IIEF questionnaires. The inclusion criteria were to include all symptomatic male patients presented to the Urology clinics during study period with LUTS those required medical treatment. We excluded the patients with diagnosed

aetiology other than BPH, patients who have undergone previous transurethral interventions and patients with penile pathologies such as penile cancer and Peyronie's disease. We also excluded the patients with indwelling catheters. Data were collected using a validated interviewer-administered questionnaire, IPSS, and IIEF. The LUTS questionnaire captured demographic and clinical characteristics, while the IPSS assessed LUTS severity on a scale from 0-35. IPSS severity was assessed as follows : 0 - 7 = mildly symptomatic; 8 - 19 = moderately symptomatic; 20 - 35 = severely symptomatic. The IIEF questionnaire addressed Erectile function component of IIEF 5 questionnaire (Q1,Q2,Q3,Q4,Q5 and Q15).Severity of ED was assessed by the score as follows ; Mild (25-30), Moderate (14-24), Severe (<14).

To ensure accuracy, a two-step confirmation was performed: patients initially filled out the forms, followed by an interview to confirm responses. SPSS version 21 was used for statistical analyses, with descriptive statistics and Pearson correlation to assess relationships between variables. Multiple linear regression explored the link between independent variables (age, occupation, education, BMI, QoL) and LUTS severity. A P-value of  $\leq 0.05$  indicated statistical significance, and VIF values  $< 3$  ensured no multicollinearity.

**Results:****Baseline characteristics of the study participants:**

The total of 181 male patients participated in this study. Their mean age and BMI were 66.65 years (SD: 8.6) and 24.4 kgm<sup>-2</sup> (SD: 4.0), respectively. The age group that contained the largest percentages of

participants (42.5%) was 61-70 years and approximately 54.7% were classified as having a normal weight. The majority of individuals (68.5%) had completed at least a secondary education. Most of them were employed as manual laborers (59.1%). The demographic characteristics of the participants are displayed in Table 1.

**Table 1: Demographic characteristics of the study participants**

Baseline characters	Total (n= 181)	n (%)
<b>Age, mean ± SD</b>	<b>66.65 ± 8.6</b>	
<b>Age years</b>		
< 50	14	7.7%
50-60	21	11.6%
61-70	77	42.5%
>70	69	38.1%
<b>BMI (kg/m<sup>2</sup>), mean ± SD</b>	<b>24.40 ± 4.0</b>	
Under weight	7	3.9%
Normal	99	54.7%
Overweight	60	33.1%
Obese	15	8.3%
<b>Educational status</b>		
Primary education	38	21%
Secondary education	124	68.5%
Higher studies	19	10.5%
<b>Working status</b>		
Manual labourer	107	59.1%
Employed in various professions	22	12.2%
Retirees	52	28.7%

**Clinical characteristics of the study participants:**

The clinical characteristics of the participants are displayed in Table 2. Around 44.2% had both voiding and storage symptoms whereas 29.3% of patients had predominant storage symptoms and 26.5% experienced predominant voiding symptoms. The majority had moderate (47%) and severe (42%) LUTS. Benign Prostatic Occlusion (BPO) was the most common underlying

diagnosis (73.5%) followed by 7.7% UTI, 5% bladder calculi, 4.4% urethral stricture, 3.9% prostate cancer, 5.5% bladder dysfunction. Only 38.1% had diabetes mellitus, followed by 42% hypertension, 28.7% hyperlipidemia, and 7.7% CKD (Chronic kidney disease). Among the 47.5% of individuals, 30.9% performed with TURP. The prevalence of Erectile Dysfunction (ED) was 28.7% among the LUTS patients, with 6.1% having severe ED.



**Table 2:** *Clinical characteristics of the study participants*

<b>Clinical characters</b>	<b>Total (n= 181)</b>	<b>n (%)</b>
<b>LUT Symptoms</b>		
Storage symptoms	53	29.3%
Voiding symptoms	48	26.5%
Storage and voiding symptoms	80	44.2%
<b>LUTS Severity</b>		
Mild	20	11%
Moderate	85	47%
Severe	76	42%
<b>Aetiology</b>		
BPO	133	73.5%
UTI	14	7.7%
Urethral stricture	8	4.4%
Bladder calculi	9	5%
Prostate cancer	7	3.9%
Bladder dysfunction (Neurogenic, overactive and under active bladder)	10	5.5%
<b>Comorbidities</b>		
<b>Diabetes mellitus</b>		
Yes	69	38.1%
No	112	61.9%
<b>Hypertension</b>		
Yes	76	42%
No	105	58%
<b>Hyperlipidemia</b>		
Yes	52	28.7%
No	129	71.9%
<b>CKD</b>		
Yes	14	7.7%
No	167	92.3%
<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%
BNI/BNR	10	5.5%
Cystolitholopaxy	7	3.9%
Radical/partial prostatectomy	4	2.2%
<b>Erectile dysfunction (ED)</b>	52	28.7%
Mild	29	16.0%
Moderate	12	6.6%
Severe	11	6.1%

The prevalence of ED was high in Severe LUTS patients. Nearly 73% of ED candidates were suffered from severe

LUTS(Table 3). Severity of ED positively associated with severity of LUTS.

**Table 3: IPSS Score VS Severity of ED****Erectile dysfunction**

LUTS	Mild(25-30)	Moderate(14-25)	Severe(<14)
Mild (0-7)	01	01	01
Moderate(8-20)	05	03	03
Severe(20-35)	23	08	07
Total	29	12	11

**Correlation analysis between IPSS and QoL before and after treatment:**

Upon analyzing the IPSS and QoL using Pearson correlation before and after treatment, a positive correlation between IPSS and QoL ( $r = 0.544$ ,  $p < 0.05$ ) was observed before treatment. However, no significant correlation between IPSS and QoL was found after treatment.

**Table 4: Correlation between IPSS vs QoL before and after treatment.**

IPSS vs QoL	Correlation coefficient (r)	P
Before treatment	0.544	0.000
After treatment	0.083	0.267

Table 5 List the variables significantly correlated with LUTS severity, based on multiple linear regression analysis, age group demonstrated a marginally significant negative association ( $\beta = -0.090$ ),  $p = 0.049$ ), suggesting that as

patients move to older age groups, LUTS severity tends to decrease. Occupation significantly influenced LUTS severity ( $\beta = -0.171$ ,  $p < 0.001$ ), indicating that certain occupations were associated with lower LUTS severity. BMI category had a significant positive effect ( $\beta = 0.163$ ,  $p = 0.015$ ), suggesting that higher BMI categories were linked to greater LUTS severity while occupations revealed reduced LUTS severity ( $\beta = -0.171$ ,  $p = 0.001$ ). QoL exhibited a highly significant positive association ( $\beta = 0.274$ ,  $p < 0.001$ ), implying that as QoL improved, LUTS severity increased. There was no evidence of multicollinearity between variables (VIF values were close to 1).

**Discussion**

Assessing LUTS is crucial for accurate diagnosis and treatment, especially in men. The IPSS questionnaire is commonly used as a tool for symptom evaluation, though it was originally designed to assess symptoms of BPO (5). This study aimed to evaluate the severity of LUTS, its association with demographic and clinical factors, and its relation to ED.

LUTS prevalence tends to increase with age and is often linked to BPO, as also seen in this study (5,6). Notably, factors such as age, occupation, BMI, and QoL significantly affected LUTS severity in male patients. Retirees reported a higher prevalence of LUTS, likely due to their older age. Obesity was found to increase the risk of LUTS, while physical inactivity among normal-weight men may contribute to its progression (7), a trend supported by our findings.

Previous studies have often reported isolated storage LUTS as the most common subtype, whereas in our study, the mixed subtype (storage and voiding LUTS) predominated (9). This mixed subtype was directly associated with BMI. Given that BPO was the most common cause of LUTS, voiding symptoms would normally be expected to predominate. However, the high prevalence of mixed LUTS suggests

the presence of secondary pathologies, such as bladder dysfunction. These findings challenge the assumption that all male LUTS cases stem solely from BPO or bladder dysfunction.

**Table 5:** *Coefficients associated with factors and their influence on LUTS severity in a regression model*

Model	Unstandardized Coefficient		Standardized Coefficient	T	Sig	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
Constant	1.680	.266		6.328	.000	1.156	2.204		
Age group	-.090	.045	-.129	-1.980	.049	-.179	.000	.847	1.153
Occupation	-.171	.052	-.247	-3.315	.001	-.273	-.069	.669	1.495
Education	.107	.083	.089	1.296	.197	-.056	.270	.777	1.287
BMI category	.163	.066	.066	2.458	.015	.032	.294	.990	1.010
QoL	.274	.037	.037	7.348	.000	.200	.347	.885	1.130

Dependent Variable: LUTS severity

Statistical significance at the  $p < 0.05$  level

These finding challenges the assumption that all male LUTS cases stem solely from BPO or bladder dysfunction.

Urodynamic studies suggest that primary bladder dysfunction, such as detrusor overactivity, may cause LUTS regardless of prostate issues. This could explain voiding symptoms in men with mixed LUTS. Therefore, comprehensive evaluation of LUTS is vital for management, focusing on specific symptoms rather than relying solely on the IPSS score. While urodynamic studies are a standard part of management in developed countries, they may not be feasible in Sri Lanka. Thus, further local studies are recommended to identify effective diagnostic and treatment approaches.

The MARSH study found that ED was more common in men with an IPSS score of  $\geq 8$  (40%) compared to the overall sample (22%) (10). Our study too supports this finding. The prevalence of ED in men with moderate-to-severe LUTS was consistent with global estimates (13–28%) [11]. Among those with ED, more than 20% (11 out of 52) were suffering from severe ED (IIEF-5 SCORE  $< 14$ ). As per our observation the IPSS severity had positive influence over the IIEF severity as nearly three fourth of ED patients were suffering from severe LUTS. As per our study, severity of ED was positively associated with degree of LUTS. We hypothesize that LUTS and ED share a common etiology, possibly involving reduced nitric oxide levels and disruptions in its production pathway. Other potential mechanisms include autonomic hyperactivity and increased rho-kinase activation (12), but further research is needed to confirm these links.

Interestingly, the study found that the IPSS score after treatment was not as predictive of QoL as the pre-treatment score. Therefore, symptom analysis should be prioritized over IPSS scores when assessing severity and QoL during follow-up visits.

When medication fails, surgical options like transurethral resection of the prostate

(TURP) are considered. TURP remains the gold standard for BPO treatment due to its minimally invasive nature. Our study found that 30.9% of patients with BPO underwent TURP. Additionally, the treatment positively influenced the correlation between IPSS and QoL. Before treatment, there was a strong positive correlation, suggesting that worsening urinary symptoms negatively impacted QoL. After treatment, however, this relationship was no longer statistically significant. This indicates that treatment may have improved urinary symptoms, reducing the impact of symptom severity on QoL. Further studies are needed to explore the mechanisms behind this change.

### Conclusion

This study highlights the substantial prevalence of ED among male patients seeking LUTS care at the urology clinic. Age, occupation, and Quality of Life (QoL) significantly influenced LUTS and ED severity. Severe LUTS associated with higher prevalence of ED. Severity of ED was associated with severity of IPSS score and age. ED was highly correlated with Metabolic syndrome.

### Limitations

The study was conducted at a single tertiary care urology clinic, which may constrain the generalizability of the findings to other settings. Additionally, the data are based on self-report, potentially introducing response bias. Nevertheless, this study boasted several strengths, including the use of two widely adopted and well-established assessment tools, which contributed to a more precise and reliable assessment. When compare to some of the studies from developed countries prevalence of ED was less in our population with LUTS, patients may be reluctant to reveal their personal sexual history due to social stigma and cultural barrier.



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