ORIGINAL ARTICLE

Frequency, Associated Factors, and Quality of Life in Men with Lower Urinary Tract Symptoms (LUTS) in Lahore, Pakistan

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Abstract

Background: Lower urinary system symptoms (LUTS) are a group of clinical complaints characterized by irregular urinary patterns. LUTS tremendously affect patient functioning and quality of life (QOL). Despite its impact, many men do not seek medical attention, which can be attributed to the low level of awareness and costs associated with healthcare resources and the stigmatization of urinary symptoms.

Objective: To assess the frequency of LUTS, its associated factors, and QOL among men at a urology clinic in Lahore, Pakistan.

Methods: This cross-sectional clinic-based study was conducted from May 2025 to July 2025 at the Urology Outpatient Department of Chaudhary Muhammad Akram Teaching and Research Hospital, Lahore, Pakistan, on 165 male participants. To evaluate LUTS and QOL, the International Prostate Symptom Score (IPSS) was used. The QOL item is scored from 0 ("delighted") to 6 ("terrible"), with scores of 0-2 representing good QOL and 3-6 indicating poor QOL. Data were analyzed using SPSS version 23.0.

Results: Mean age was 52.1 ± 14.7 years. Mean IPSS score was 13.6 ± 12.1, with 73.9% of participants reporting LUTS. In univariate analysis, LUTS were associated with age, lower education, lower income, diabetes, and hypertension; however, none of these remained significant in multivariable logistic regression. The mean QOL score was 3.1 ± 1.8, and 2/3 (66.7%) reported poor QOL. In univariate analysis, poor QOL was associated with age, diabetes mellitus, absence of alcohol use, tea intake, and LUTS; however, in multivariable logistic regression, poor QOL was associated with LUTS severity, while alcohol use was inversely associated with poor QOL.

Conclusion: LUTS were highly prevalent among adult males presenting to the urology clinic, significantly affecting QOL. Routine screening and early management are essential to reduce symptom burden and improve QOL.

Keywords: *Lower urinary tract symptoms (LUTS), Quality of Life (QOL), males, incomplete emptying, urgency, weak urinary stream, nocturia, urology, Pakistan.*

INTRODUCTION

Lower urinary tract symptoms (LUTS) comprise a range of clinical complaints related to abnormal urinary patterns arising from dysfunction of the lower urinary tract [1]. Broadly classified as obstructive (voiding) or irritative (storage), LUTS often occur in combination [1]. LUTS are commonly associated with underlying urological or neurological disorders such as benign prostatic hyperplasia (BPH), which is recognized as one of the most prevalent conditions among men over 50 years [1, 2]. Globally, the burden of LUTS increases with age. More than half of men aged 61-70 years report at least one LUTS, and the prevalence of moderate to severe symptoms rises from 13% in men aged 40-49 years to 28% in those over 70 years [3]. A recent meta-analysis estimated that 63.2% of adults worldwide experience LUTS, with 31.3% reporting moderate to severe symptoms [4]. Studies from South Asia show comparable or higher figures. In India, Kant *et al.* observed LUTS in 85% of men over 50 years, most frequently nocturia (85.4%) and a weak urinary stream (35%), with symptom severity strongly linked to poor quality of life (QOL; $p<0.001$) [5].

Within Pakistan, reported prevalence varies by region. Salman *et al.* reported a prevalence of LUTS of 33.7% among adult men in the Punjab Province [6]. This prevalence was found to be significantly associated with higher age, unemployment, diabetes, hypertension, and smoking history [6]. In contrast, Shahzad *et al.* reported that the prevalence of LUTS symptoms was 23.5% in the Hazara Division; there was substantial evidence of underutilization of treatment facilities for these symptoms [7]. Factors such as stigma, poor awareness, or financial constraints are some essential reasons for men's reluctance towards seeking health care [6, 8]. LUTS substantially impair QOL by disrupting sleep, daily activities, social interactions, and emotional well-

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being [1, 9]. Up to half of affected individuals modify their behavior, such as restricting fluid intake or travel, to manage symptoms [1]. Untreated LUTS can lead to complications, including sexual dysfunction, psychological distress, and increased risk of nocturnal falls [6, 10].

Although data exist from other Pakistani regions, there is limited published evidence from Lahore, one of the country's largest and most demographically diverse cities. Understanding the local prevalence, risk factors, and association with QOL is essential to guide early detection and intervention strategies in urban male populations. Therefore, this study aimed to assess the frequency of LUTS, its associated factors, and QOL among adult men attending a urology clinic in Lahore, Pakistan.

METHODOLOGY

This cross-sectional clinic-based study was conducted from May 2025 to July 2025 at the Urology Outpatient Department (OPD) of Chaudhary Muhammad Akram Teaching and Research Hospital, affiliated with Azra Naheed Medical College, Superior University, Lahore, Pakistan, following approval from the Institutional Ethical Review Committee (IRB#ANMC/IRB/2025/024) on April 30, 2025. The study followed the standards laid down in the 1964 Declaration of Helsinki, revised in 2000.

Written informed consent was obtained from each patient before inclusion in the study. Patient confidentiality and data privacy were strictly maintained throughout the research, and no patient-identifiable information was used in the analysis. All men aged 30 years and above who visited the urology OPD clinic during the study period were considered eligible. The patients with urinary tract infection, chronic kidney disease, renal stones, prostate or bladder malignancy, neurogenic bladder, or previous urological surgeries were excluded.

The sample size was calculated using a 89.8% prevalence rate of LUTS [11], with a 5% margin of error and a 95% confidence level; the required sample size was determined to be 141 using the Openepi online calculator. However, to improve the study's robustness, a total of 165 male participants were ultimately included. The participants were selected using a non-probability, consecutive sampling method. Data collection was conducted using a structured questionnaire, which collected information on respondents' personal characteristics, such as age, marital status, education level, employment status, and monthly family income. Medical history regarding conditions such as diabetes mellitus and hypertension was also recorded, along with lifestyle factors including smoking, alcohol use, and tea intake. The urinary symptoms, LUTS, and QOL were subsequently assessed using the International Prostate Symptom Score (IPSS) questionnaire [8, 12]. The questionnaires were administered as face-to-face interviews in the presence of a medical doctor to ensure the participants' understanding.

Assessments of urinary symptoms and their impact on QOL were made using the IPSS questionnaire. This is a standardized instrument comprising seven questions on urinary symptoms, including incomplete emptying, intermittency, frequency, weak stream, urgency, straining, and nocturia, with one additional question on QOL related to difficulties with urination [8, 12]. Symptoms are scored from 0 ("not at all") to 5 ("almost always"), yielding a total score of 0 to 35. Symptom severity was then categorized as: 0 = none, 1-7 = mild, 8-19 = moderate, and 20-35 = severe [8, 12]. The QOL item was scored from 0 ("delighted") to 6 ("terrible"), with scores of 0-2 representing good QOL and 3-6 indicating poor QOL.

Data entry and statistical analyses were performed using SPSS version 23.0. Descriptive statistics were used to summarize participant characteristics. Summary measures included frequencies and percentages for categorical data and mean ± standard deviation (SD) for continuous data. Associations between independent variables and LUTS or QOL were first examined using Pearson's Chi-square test or Fisher's exact test, as appropriate. Analyses were used to determine potential associations or to select variables for inclusion in a multivariable model. Binary logistic regression was performed to identify factors independently associated with LUTS and QOL.

For the LUTS model, the dependent variable was the presence of LUTS (IPSS ≥ 1, coded as 1) *versus* its absence (IPSS = 0, coded as 0). Variables entered into the multivariable LUTS model included age, marital status, education status, employment status, hypertension, smoking status, alcohol use, and tea intake. Although family income and diabetes mellitus showed statistically significant associations with LUTS in univariate analysis, they were not included in the multivariable LUTS model due to the complete separation of data. Specifically, all participants with diabetes mellitus and all participants with a monthly family income ≤50,000 PKR reported LUTS, resulting in zero observations in the LUTS-absent category for these variables. As standard logistic regression cannot provide valid estimates under conditions of complete separation, these variables were excluded from the multivariable analysis. Given the limited number of participants without LUTS (n=43) relative to those with LUTS (n=122), the multivariable model included only a limited number of predictors to reduce the risk of overfitting and unstable estimates.

For the QOL model, binary logistic regression was conducted with QOL as the dependent variable, coded as poor QOL (QOL score 3-6 = 1) *versus* good QOL (QOL score 0-2 = 0). Independent variables included age, marital status, educational status, employment status, family income, diabetes mellitus, hypertension,

smoking status, alcohol use, tea intake, and presence of LUTS to assess the association between LUTS and QOL while adjusting for potential confounders. Poor QOL was coded as 1 and good QOL as 0. Age categorization (≤48 *vs.* ≥49 years) was based on the study sample distribution (median split). At the same time, family income (≤50,000 *vs.* >50,000 PKR/month) and tea intake (≤2 *vs.* >2 cups/day) were aligned with thresholds used in previous studies to maintain consistency. It is acknowledged that dichotomization may reduce statistical power and obscure potential dose-response relationships. Adjusted odds ratios (ORs) with 95% confidence intervals (CIs) were reported. All statistical tests were two-tailed, and a p-value ≤0.05 was considered statistically significant.

RESULTS

The study included 165 men presenting to the urology clinic, with a mean age of 52.1 ± 14.7 years, of whom 92 (55.8%) were aged ≥49 years. Most participants were married (80.0%), had less than 10 years of education (83.6%), and reported a family income >50,000 PKR/month (153, 92.7%). Comorbidities included diabetes mellitus in 46 (27.9%) and hypertension in 52 (31.5%). Lifestyle factors showed 73 (44.2%) smokers, 14 (8.5%) alcohol users, and 127 (77.0%) consumed more than two cups of tea per day (**Table 1**).

The mean IPSS score was 13.6 ± 12.1, with 122 (73.9%) participants reporting LUTS. Symptom severity was categorized as mild (24, 14.5%), moderate (25.5%), and severe (33.9%) as presented in Fig. **1**. The most frequently reported LUTS were frequency (67.8%) and urgency (63.0%) as depicted in Table **2**.

Table 1: Demographic and clinical variables of the patients (N=165).

Patient Variables	Sub-Groups	Frequency	Percentage
Age	≤48 years	73	44.2
	>48 years	92	55.8
Marital Status	Married	132	80.0
	Unmarried	33	20.0
Education Status	≤10 standards	138	83.6
	>10 standards	27	16.4
Employment Status	Employed	74	44.8
	Unemployed	91	55.2
Family income	≤50,000 PKR/month	12	7.3
	>50,000 PKR/month	153	92.7
Diabetes Mellitus	Present	46	27.9
	Absent	119	72.1
Hypertension	Present	52	31.5
	Absent	113	68.5
Smoking	Present	73	44.2
	Absent	92	55.8
Alcohol Use	Present	14	8.5
	Absent	151	91.5
Tea Intake	≤2 cups/day	38	23.0
	>2 cups/day	127	77.0
Lower Urinary Tract Symptoms (LUTS)	Present	122	73.9
	Absent	43	26.1
Quality of Life (QOL)	Good (QOL score: 0-2)	55	33.3
	Poor (QOL score: 3-6)	110	66.7

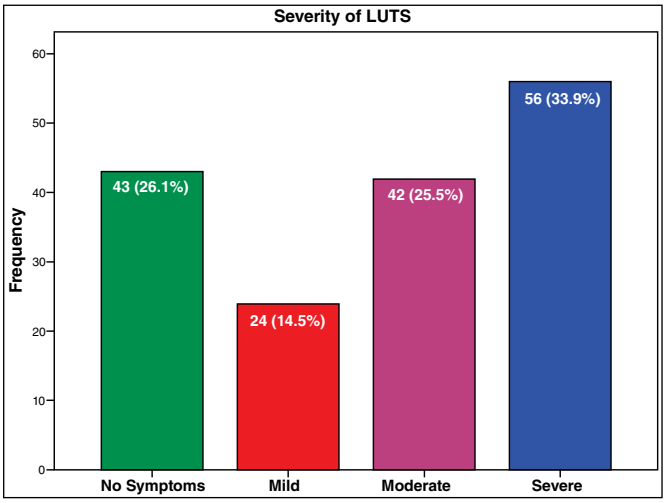

Fig. (1): Severity of LUTS in the patients according to IPSS (N=165). LUTS: Lower Urinary Tract Symptoms; IPSS: International Prostate Symptom Score.

Table 2: Symptoms of LUTS in the patients (N=165).

Symptoms of LUTS	Mean IPSS Score	Range	Frequency	Percentage
Incomplete Emptying	1.8±1.8	0-5	92	55.7
Frequency	2.4±1.9	0-5	112	67.8
Intermittency	1.8±1.8	0-5	96	58.2
Urgency	2.2±1.9	0-5	104	63.0
Weak Stream	1.6±2.0	0-5	78	47.2
Straining	1.7±2.0	0-5	84	50.9
Nocturia	1.8±1.9	0-5	90	54.5

LUTS: Lower Urinary Tract Symptoms; IPSS: International Prostate Symptom Score

Univariate analysis revealed significant associations between LUTS and age, education, family income, diabetes mellitus, and hypertension as presented in Table **3**. No significant association was observed with marital status, employment, smoking, alcohol use, or tea intake. However, after adjustment for potential confounders in multivariable logistic regression, none of these factors remained independently associated with LUTS (**Table 4**), suggesting that the observed univariate associations may be explained by interrelationships among these variables.

The mean QOL score was 3.1 ± 1.8, with 110 (66.7%) participants classified as having poor QOL. Univariate analysis showed significant associations between poor QOL and age, diabetes mellitus, alcohol use, tea intake, and LUTS, as shown in Table **5**. In multivariable analysis, only LUTS remained a significant independent predictor of poor QOL, whereas alcohol use was associated with lower odds of poor QOL, as depicted in Table **6**. Notably, the association between LUTS and poor QOL was strong but imprecise, as reflected by the wide confidence interval, suggesting variability in the estimated effect. Although alcohol use was inversely associated with poor QOL, this finding should be interpreted cautiously

Table 3: Stratification of data about LUTS (N=165).

Patient Variables	Sub-Groups	LUTS		Pearson Chi-Square Value	p-value
		Absent n(%)	Present n(%)		
Age	≤48 years	35 (47.9)	38 (52.1)	32.541	<0.001*
	>48 years	08 (8.7)	84 (91.3)		
Marital Status	Married	30 (22.7)	102 (77.3)	3.806	0.051
	Unmarried	13 (39.4)	20 (60.6)		
Education Status	≤10 standards	30 (21.7)	108 (78.3)	8.173	0.004*
	>10 standards	13 (48.1)	14 (51.9)		
Employment Status	Employed	22 (29.7)	52 (70.3)	0.937	0.333
	Unemployed	21 (23.1)	70 (76.9)		
Family income	≤50,000 PKR/month	0 (0.0)	12 (100)	4.561	0.037*
	>50,000 PKR/month	43 (28.1)	110 (71.9)		
Diabetes mellitus	Present	0 (0.0)	46 (100)	22.480	<0.001*
	Absent	43 (36.1)	76 (63.9)		
Hypertension	Present	08 (15.4)	44 (84.6)	4.491	0.034*
	Absent	35 (31.0)	78 (69.0)		
Smoking	Present	15 (20.5)	58 (79.5)	2.065	0.151
	Absent	28 (30.4)	64 (69.6)		
Alcohol Use	Present	02 (14.3)	12 (85.7)	1.101	0.294
	Absent	41 (27.2)	110 (72.8)		
Tea Intake	≤2 cups/day	10 (26.3)	28 (73.7)	0.002	0.967
	>2 cups/day	33 (26.0)	94 (74.0)		

LUTS: Lower Urinary Tract Symptoms; IPSS: International Prostate Symptom Score, *Significant at p<0.05

Table 4: Multivariable binary logistic regression analysis of data about LUTS.

Demographic and clinical variables	Beta Coefficient (B)	S.E.	Wald	p-value	Adjusted Odds Ratio (OR)	95% CI for OR	
						Lower	Upper
Age	1.655	0.861	3.691	0.055	5.233	0.967	28.307
Marital Status	0.837	0.779	1.154	0.283	2.308	0.502	10.622
Education Status	0.167	0.395	0.178	0.673	1.181	0.545	2.560
Employment Status	0.184	0.638	0.083	0.774	1.201	0.344	4.200
Hypertension	0.473	0.858	0.304	0.581	1.604	0.299	8.615
Smoking	0.745	0.651	1.310	0.252	2.107	0.588	7.553
Alcohol Use	-0.814	1.393	0.342	0.559	0.443	0.029	6.788
Tea Intake	0.756	0.697	1.178	0.278	2.130	0.544	8.345

CI: Confidence Interval, LUTS: Lower Urinary Tract Symptoms; S.E.: Standard Error

Table 5: Stratification of data about Quality of Life (N=165).

Variables	Sub-Groups	Quality of Life		Pearson Chi-Square Value	p-value
		Good n(%)	Poor n(%)		
Age	≤48 years	37 (50.5)	36 (49.3)	17.738	<0.001*
	>48 years	18 (19.6)	74 (80.4)		
Marital Status	Married	40 (30.3)	92 (69.7)	2.727	0.099
	Unmarried	15 (45.5)	18 (54.5)		
Education Status	≤10 standards	42 (30.4)	96 (69.6)	3.188	0.074
	>10 standards	13 (48.1)	14 (51.4)		
Employment Status	Employed	22 (29.7)	52 (70.3)	0.784	0.376
	Unemployed	33 (36.3)	58 (63.7)		
Family income	≤50,000 PKR/month	02 (16.7)	10 (83.3)	1.618	0.203
	>50,000 PKR/month	53 (34.6)	100 (65.4)		
Diabetes mellitus	Present	06 (13.0)	40 (87.0)	11.816	0.001*
	Absent	49 (41.2)	70 (58.8)		
Hypertension	Present	12 (23.1)	40 (76.9)	3.594	0.058
	Absent	43 (38.1)	70 (61.9)		
Smoking	Present	23 (31.5)	50 (68.5)	0.197	0.658
	Absent	32 (34.8)	60 (65.2)		

Variables	Sub-Groups	Quality of Life		Pearson Chi-Square Value	p-value
		Good n(%)	Poor n(%)		
Alcohol Use	Present	08 (57.1)	06 (42.9)	3.903	0.048*
	Absent	47 (31.1)	104 (68.9)		
Tea Intake	≤2 cups/day	20 (52.6)	18 (47.4)	8.274	0.004*
	>2 cups/day	35 (27.6)	92 (72.4)		
Lower Urinary Tract Symptoms (LUTS)	Absent	27 (62.8)	16 (37.2)	22.709	<0.001*
	Present	28 (23.0)	94 (77.0)		

*Significant at p<0.05

Table 6: Multivariable binary logistic regression analysis of data about poor QOL.

Demographic and clinical variables	Beta Coefficient (B)	S.E.	Wald	p-value	Odds Ratio (OR)	95% CI for OR	
						Lower	Upper
Age	0.899	0.756	1.413	0.235	2.457	0.558	10.815
Marital Status	0.181	0.738	0.060	0.806	1.198	0.282	5.090
Education Status	-0.006	0.402	0.000	0.989	0.994	0.453	2.185
Employment Status	0.817	0.632	1.673	0.196	2.264	0.656	7.810
Family income	0.004	1.359	0.000	0.998	1.004	0.070	14.404
Diabetes Mellitus	0.685	0.882	0.603	0.437	1.983	0.352	11.171
Hypertension	0.488	0.761	0.411	0.521	1.629	0.367	7.236
Smoking	-0.290	0.613	0.223	0.637	0.748	0.225	2.489
Alcohol Use	-1.866	0.942	3.927	0.048*	0.155	0.024	0.980
Tea Intake	-1.216	0.674	3.260	0.071	0.296	0.079	1.110
Lower Urinary Tract Symptoms (LUTS)	1.464	0.679	4.649	0.031*	4.324	1.142	16.363

CI: Confidence Interval, QOL: Quality of Life, S.E: Standard error, *Significant at p<0.05

due to the small number of alcohol users and the wide confidence interval, and it should not be taken to imply a protective effect of alcohol.

DISCUSSION

The findings of our study reveal a high prevalence of LUTS among adult males presenting to the urology clinic, with nearly three-quarters (73.9%) of participants reporting at least one symptom and one-third (33.9%) experiencing severe LUTS. This aligns with previous reports from the region and globally, which indicate prevalence estimates as high as 85% in India and 89.8% in Malaysia [8, 13]. Globally, the incidence of LUTS varies significantly, ranging from 13% to 70% [14-16]. Several studies conducted in Pakistan regarding the incidence of LUTS in the past have reported low incidences: 33.7% in the population studied by Salman *et al.* and 23.5% by Shahzad *et al.* [6, 7]. These changes may be attributed to age variability, diagnostic criteria used, symptom perception, and differences in the population, as suggested in this study. For example, the patient population attending urology clinics may show a higher incidence than the general population in the country. The symptoms in the present study's patient population include urinary frequency, urgency, and nocturia, accounting for 67.8%, 63.0%, and 54.5% of cases, respectively. Similar surveys have highlighted nocturia and weak urinary streams as common presentations, with erectile dysfunction often being associated [8, 10]. Even though the role of frequency of erectile dysfunction was not evaluated, the prevalence of erectile dysfunction that was documented justifies the need to consider it as another factor that may shape behavior. Future research should explore erectile dysfunction, recognizing its role, even as the patient presents with lower urinary tract symptoms [17, 18].

Even though univariate analysis for our research showed various associations with LUTS, including advancing age, diabetes mellitus, and hypertension, multivariate analysis did not reveal similar associations. No patient factors showed statistical significance. However, the literature shows involvement of various metabolic factors, as well as advancing age, in LUTS [19, 20]. For instance, different research papers have shown the considerable association of diabetes and hypertension with LUTS, particularly in the neighboring Indian population [8, 20]. Kant *et al.* also reported a borderline statistical association between tea intake >2 per day and LUTS, possibly due to the beverage's diuretic effects [5]. In our study, 77% of participants consumed more than two cups of tea per day. While tea intake was associated with poor QOL on univariate analysis, this association did not persist in multivariable analysis. Similarly, other lifestyle factors, such as alcohol use, showed variable associations with QOL but not with LUTS prevalence, suggesting a more complex interplay of behavioral and physiological characteristics. Although alcohol use was associated with lower odds of poor QOL in our study, this finding does not imply causality. It should be interpreted cautiously due to the small number of alcohol users and the wide confidence interval, and it should not be taken to indicate a protective effect of alcohol. Overall, the negative impact of LUTS on QOL observed in our study suggests the importance of routine screening, particularly among older adults and individuals with comorbidities or high-

risk lifestyle habits. It has also been reported in previous studies that increasing comorbid conditions and poor QOL influence seeking medical help in older men with LUTS [13, 21, 22]. These findings reinforce the value of integrating validated symptom assessment tools, such as the IPSS, into primary and outpatient care to facilitate timely diagnosis and appropriate management.

This study has several limitations, including the issue of complete separation and its impact on regression modelling, the limited generalisability due to the single-centre, urology OPD-based, non-probability sample, and the use of a single IPSS QOL item rather than a multi-domain QOL instrument. The cross-sectional clinic-based study design prevents the establishment of causal relationships between risk factors and LUTS or QOL. Because the study was conducted at a single institution using nonprobability consecutive sampling, the findings may not be generalizable to the broader male population. Additionally, we did not investigate the underlying causes of LUTS, and self-reported data on urinary symptoms and lifestyle factors may be subject to recall or reporting bias. Potential confounding variables may also have influenced the observed associations. Despite these limitations, this study used the IPSS questionnaire, a reliable and validated tool, to provide valuable information on LUTS and QOL in adult males in Lahore, Pakistan. In relation to this, the implications of this study for clinicians are evident, particularly in understanding LUTS and its influence on QOL, emphasizing the necessity of screening, especially in older adults and those with comorbid conditions. Future research should focus on large-scale, multicenter, and longitudinal studies to explore causal relationships and the effects of lifestyle and metabolic factors. Integrating validated tools such as the IPSS into primary and outpatient care facilitates early diagnosis, guides management, and improves patient quality of life.

CONCLUSION

The present study reported a high prevalence of LUTS, with approximately one-third of the patients reporting severe LUTS symptoms. Moreover, urinary frequency and urgency were the most frequently reported symptoms of LUTS, and LUTS symptoms also had a notable effect on quality of life among patients. Thus, identifying these patients, especially senior citizens and those with comorbid conditions, may significantly benefit from symptom management. Furthermore, diagnostic tools such as IPSS may also be appropriately employed in routine clinical practice to improve patient care through early diagnosis and management.

ETHICS APPROVAL

This study was conducted after obtaining ethical approval from the Institutional Ethical Review Committee of Azra Naheed Medical College, Superior University, Lahore ((IRB#ANMC/IRB/2025/024). Pakistan, dated April 30, 2025, before data collection. All procedures performed in studies involving human participants were conducted in accordance with the ethical standards of the institutional and/or national research committee and the Helsinki Declaration.

CONSENT FOR PUBLICATION

Written informed consent was obtained from each patient before inclusion in the study.

AVAILABILITY OF DATA

Data generated or analyzed during this study are available from the corresponding author upon reasonable request.

FUNDING

None.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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Declared none.

AUTHORS' CONTRIBUTION

This study was conceived and designed by BW, NIB, and AB. BW, NIB, UJ, and AB did the initial literature research. BW and NIB conducted data collection, patient assembly, and assessment. NIB, BW, and UJ did data analysis and interpretation. BW, UJ, and NIB were involved in manuscript writing. NIB, AB, and BW did the final critical review and corrections. All authors read and approved the final manuscript.

GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

In this study, author made limited use of ChatGPT (GPT-4, OpenAI) for minor proofreading and language suggestions. Author reviewed and edited the content as needed and takes full responsibility for the manuscript content.

REFERENCES

1. Zhang AY, Xu X. Prevalence, burden, and treatment of lower urinary tract symptoms in men aged 50 and older: A systematic review of the literature. Sage Open Nurs 2018; 4: 1-24. DOI: https://doi.org/10.1177/2377960818811773
2. Sperry BW, Summers S, Patel D, Garcia M, Bandeko C. A practical approach for primary care practitioners to evaluate and manage lower urinary tract symptoms and benign prostatic hyperplasia. Fed Pract 2021; 38(12): 573-81. DOI: https://doi.org/10.12788/fp.0197
3. Soler R, Gomes CM, Averbeck MA, Koyama M. The prevalence of lower urinary tract symptoms (LUTS) in Brazil: Results from the epidemiology of LUTS (Brazil LUTS) study. Neurourol Urodyn 2018; 37(4): 1356-64. DOI: https://doi.org/10.1002/nau.23446
4. Huang J, Chan CK, Yee S, Deng Y, Bai Y, Chan SC, *et al.* Global burden and temporal trends of lower urinary tract symptoms: A systematic review and meta-analysis. Prostate Cancer Prostatic

Dis 2023; 26(2): 421-8.
DOI: https://doi.org/10.1038/s41391-022-00610-w

5. Kant P, Inbaraj LR, Franklyn NN, Norman G. Prevalence, risk factors, and quality of life of Lower Urinary Tract Symptoms (LUTS) among men attending Primary Care slum clinics in Bangalore: A cross-sectional study. J Family Med Prim Care 2021; 10(6): 2241-5.
DOI: https://doi.org/10.4103/jfmpc.jfmpc_2316_20
6. Salman M, Khan J, Khan A, Sulaiman SAS, Aslam Z, Asif N, *et al.* Prevalence and predictors of lower urinary tract symptoms in Pakistani men: A cross-sectional study. J Clin Urol 2018; 12(4): 307-13.
DOI: https://doi.org/10.1177/2051415818815371
7. Shahzad M, Jamil MN, Haq FU, Aminullah, Islam EU, Thaimur MF. Relationship between lower urinary tract symptoms and treatment-related behaviour in the Hazara division. J Ayub Med Coll Abbottabad 2024; 36(1): 143-9.
DOI: https://doi.org/10.55519/JAMC-01-12845
8. Ojewola RW, Oridota ES, Balogun OS, Ogundare EO, Alabi TO. Lower urinary tract symptoms: prevalence, perceptions, and healthcare-seeking behavior amongst Nigerian men. World J Mens Health 2016; 34(3): 200-8.
DOI: https://doi.org/10.5534/wjmh.2016.34.3.200
9. Langan RC. Benign prostatic hyperplasia. Prim Care 2019; 46(2): 223-32.
DOI: https://doi.org/10.1016/j.pop.2019.02.003
10. Gkatzoudi C, Bouloukaki I, Mamoulakis C, Lionis C, Tsiligianni I. Evaluation of lower urinary tract symptoms in males and urinary incontinence in females in primary health care in Greece. Medicina (Kaunas) 2024; 60(3): 389.
DOI: https://doi.org/10.3390/medicina60030389
11. Isa NMM, Aziz AFA. Lower Urinary tract symptoms: Prevalence and factors associated with help-seeking in male primary care attendees. Korean J Fam Med 2020; 41(4): 256-62.
DOI: https://doi.org/10.4082/kjfm.19.0012
12. Yao MW, Green JSA. How international is the International Prostate Symptom Score? A literature review of validated translations of the IPSS, the most widely used self-administered patient questionnaire for male lower urinary tract symptoms. Low Urin Tract Symptoms 2022; 14(2): 92-101.
DOI: https://doi.org/10.1111/luts.12415
13. Kohler TS, Kausik SJ. Comparison of IPSS score and voiding parameters in men presenting with LUTS. Can J Urol 2023; 30(5): 11668-75.
14. Tan LH, Chou EC. Association and prevalence of lower urinary tract symptoms in individuals with sarcopenia: A systematic review and meta-analysis. Medicina (Kaunas) 2025; 61(7): 1214.
DOI: https://doi.org/10.3390/medicina61071214
15. Johnson TV, Goodman M, Master VA. The efficacy of written screening tools in an inner city hospital: literacy-based limitations on patient access to appropriate care. J Urol 2007; 178(2): 623-9; discussion 629.
DOI: https://doi.org/10.1016/j.juro.2007.03.118
16. Sekido N, Omae K, Haga N, Kubota Y, Saito M, Sakakibara R, *et al.* Impact of lower urinary tract symptoms on daily life in individuals with co-existence of overactive and underactive bladder, overactive bladder, and underactive bladder. Low Urin Tract Symptoms 2025; 17(5): e70026.
DOI: https://doi.org/10.1111/luts.70026
17. Matsuda Y, Kobayashi K, Fukuta F, Takayanagi A, Hashimoto K, Tanaka T, *et al.* Which happens earlier, lower urinary tract symptoms or erectile dysfunction? Sex Med 2021; 9(2): 100275.
DOI: https://doi.org/10.1016/j.esxm.2020.10.003
18. Bravo-Balado A, Trujillo CG, Caicedo JI, García S, Azuero J, Rondón M, *et al.* Assessment of female sexual dysfunction and erectile dysfunction and its association with lower urinary tract symptoms in women and men over 18 years old: Results from the COBaLT study. J Sex Med 2021; 18(6): 1065-74.
DOI: https://doi.org/10.1016/j.jsxm.2021.02.009
19. Saberian M, Amirabadizadeh A, Saatchi M, Delbari A. Lower urinary tract symptoms (LUTS) and sleep quality: The mediating role of anxiety and depression in middle-aged and older adults from the Ardakan Cohort Study on Aging (ACSA). BMC Urol 2025; 25(1): 157.
DOI: https://doi.org/10.1186/s12894-025-01835-2
20. Nandy PR, Saha S. Association between components of metabolic syndrome and prostatic enlargement: An Indian perspective. Med J Armed Forces India 2016; 72(4): 350-5.
DOI: https://doi.org/10.1016/j.mjafi.2016.07.005
21. Vasudevan V, Fernandez GM, Dunn RL, Miner M, Roehrborn C, Rosen R, *et al.* BPH registry and patient survey steering committee. Relative impact of male urinary conditions on overall quality of life. Neurourol Urodyn 2025; 44(6): 1325-31.
DOI: https://doi.org/10.1002/nau.70090
22. Sekido N, Omae K, Haga N, Kubota Y, Saito M, Sakakibara R, *et al.* Prevalence, impact on quality of life, and predictive factors of coexistence of overactive bladder and underactive bladder in men. Sci Rep 2025; 15(1): 21313.
DOI: https://doi.org/10.1038/s41598-025-06299-w