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COMMUNITY-BASED ASSESSMENT OF LOWER URINARY TRACT SYMPTOMS AND RISK FACTORS IN A NIGERIAN COHORT

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ABSTRACT
Lower urinary tract symptoms (LUTS) are common among ageing men and represent a significant clinical burden in sub-Saharan Africa. This study examined the prevalence and risk factors of LUTS and co-existing chronic conditions among men in Nigeria. After obtaining informed consent, a cross-sectional study was conducted among 81 men in Ilesa-West, Nigeria, using structured questionnaires and clinical evaluations. Chi-square and logistic regression analyses were used for the study. The mean age of participants was 55.3 ± 11.0 years. Chronic conditions were reported by 37 (45.7%) participants, predominantly hypertension (64.9%) and peptic ulcer disease (35.1%). LUTS were prevalent among 27 participants (33.3%) with majorly back pain (70.4%) and difficulty in urinating (37%). Significant associations with LUTS were observed for age ($p < 0.05$), employment status ($p < 0.05$), income ($p < 0.05$), blood pressure ($p = 0.033$) and prostate-specific antigen (PSA) level ($p = 0.012$). After adjustment, non-hypertensive men were less likely to report LUTS compared to hypertensives (AOR = 0.357; $p = 0.050$). Early identification and treatment of LUTS particularly among hypertensive men can improve quality of life and reduce healthcare burdens in Nigeria.

Keywords: Lower Urinary Tract Symptoms, Hypertension, Risk Factors, Community-Based Study.

INTRODUCTION

Lower urinary tract symptoms (LUTS) represent a group of storage, voiding and post-micturition disturbances that significantly affect men's quality of life, particularly in aging populations (Kocjancic *et al,* 2022). In men aged 40 years and above, gradually worsening LUTS are commonly linked to conditions such as benign and malignant prostate enlargement, chronic prostatitis, urethral strictures, bladder cancers, neurogenic bladder issues, disorders that increase urine production and various other health problems (Brucker and Kalra, 2017). Globally, the prevalence of LUTS increases with age, with up to 50% of men above 50 years reporting at least one symptom (Huang *et al,* 2023). Lower urinary tract symptoms not only contribute to poor health-related quality of life but also impose social, psychological and economic burdens on patients and health systems (Pilarska *et al,* 2025).

In sub-Saharan Africa (SSA), the burden of LUTS remains under-explored compared to high-income settings (Bajunirwe *et al,* 2023). Also, most men present late for care, often when symptoms are severe or associated with complications such as urinary retention (MacKenzie and Aning, 2016). This under-recognition is further compounded by limited community-based epidemiological data, poor health-seeking behavior and low awareness of urological health (Ojewola *et al,* 2016). While hospital-based data on the prevalence of LUTS in Nigeria has been recorded (Ugwumba *et al,* 2014), there is little to no information on its prevalence at the community level. Evidence from other resource-poor areas indicates that community-based rates of LUTS may differ significantly from those observed in hospitals (Stothers *et al,* 2017). Risk factors for LUTS extend beyond aging to include co-morbid chronic conditions such as hypertension, diabetes mellitus and lifestyle factors (obesity, smoking, physical inactivity, poor diet, and excessive alcohol consumption), which are highly prevalent in Nigeria (Chineme-Anyaeze *et al,* 2024). Evidence suggests that hypertension, for instance, is associated with a higher likelihood of developing LUTS, reflecting possible shared patho-physiological mechanisms such as vascular dysfunction (Maharajh *et al,* 2015). Moreover, socioeconomic and occupational factors influence access to care and timely diagnosis (Nnabugwu *et al,* 2020).

This study was designed as a community-based assessment to determine the prevalence and patterns of LUTS and their risk factors among men in Nigeria, with emphasis on demographic, socio-economic and clinical correlates. The study provides critical insight into the burden of LUTS in under-served Nigerian populations and highlights potential targets for early detection and intervention by examining associations with respondents' socio-demographic attributes and co-morbidities.

MATERIALS AND METHODS

Study Area, Design and Population

This is a cross-sectional prospective study. The Saving Our Men Initiative (SOMI) was created to tackle the challenges of late diagnosis and low awareness of prostate cancer in Nigeria by focusing on education, early detection, prevention and research. Using a comprehensive, community-based strategy, SOMI carries out awareness campaigns, offers free prostate cancer screenings, provides patient counseling and supports treatment through financial assistance. This study was carried out to address local health needs and support the development of an evidence-based health promotion program for men aged 40 years and above in Ilesa West, Osun State, Nigeria.

Data Collection

Data were collected using a structured, interviewer-administered questionnaire covering respondents' socio-demographic variables, clinical assessments (blood pressure measurement, prostate-specific antigen (PSA) testing) and self-reported chronic conditions such as hypertension, diabetes mellitus, asthma and peptic ulcer disease.

Based on previous studies, the cut-off value for an elevated serum PSA level was set at ≥ 4.0 ng/mL (Berenguer *et al.,* 2023). Blood pressure was categorized as:

- Hypotension: < 100 mmHg systolic and < 70 mmHg diastolic

- Normal: < 120 mmHg systolic and < 80 mmHg diastolic
- Elevated: 120-129 mmHg systolic and < 80 mmHg diastolic
- High: (i.e., hypertension stage 1 and above):

i. Stage 1 hypertension: 130-139 mmHg systolic and/or 80-89 mmHg diastolic
ii. Stage 2 hypertension: ≥ 140 mmHg systolic and/or ≥ 90 mmHg diastolic (Flack and Adekola, 2020)

Data Analyses

Descriptive statistics summarized frequencies and percentages. Chi-square tests were used to explore associations between LUTS and categorical variables. Logistic regression models were fitted to determine independent predictors of LUTS, adjusting for co-morbidities. Statistical analyses were performed using SPSS version 26. Statistical significance was set at $p \leq 0.05$.

RESULTS

A total of 81 men were present for the community-based program, with a mean age of 55.3 ± 11.0 years. About 37% were younger than 50 years while 63% were 50 years and older. Almost two-thirds (64.2%) of them had at least secondary level of education (inclusive of tertiary education), while 35.8% had low educational attainment (primary or no formal education). Majority (90.1%) of them were employed. More than half of the respondents (56.8%) earn less than the minimum wage, 33.3% earn above the minimum wage and 9.9% did not have any income (reflecting the proportion of unemployed respondents). Most of the respondents were married (92.6%) while 7.4% were widowers/divorced (Table 1).

Table 1: Socio-Demographic Characteristics of Respondents (n=81)

Variables	Frequency	Per cent (%)
Age (years)		
<50	30	37%
≥50	51	63%
Mean age = 55.30 ± 11.02		
Marital Status		
Married	75	92.6%
Widower/Divorced	6	7.4%
Educational Level		
Low	29	35.8%
High (≥ Secondary)	52	64.2%
Employment Status		
Employed	73	90.1%
Unemployed	8	9.9%
Monthly Income		
<Minimum Wage	46	56.8%
>Minimum Wage	27	33.3%
None	8	9.9%

Table 2 revealed that a little less than half of the respondents (45.7%) reported having at least one co-existing chronic disease. Hypertension emerged as the most prevalent chronic condition, affecting 64.9% of those with co-morbidities, followed by peptic ulcer disease (35.1%), diabetes mellitus (8.1%) and asthma (5.4%).

Table 2: Co-morbidities among Participants (n = 81)

Variables	Frequency	Per cent (%)
Co-existing chronic diseases		
Yes	37	45.7
No	44	54.3
(n = 37)		
Hypertension		
Yes	24	64.9
No	13	35.1
Peptic Ulcer Disease		
Yes	13	35.1
No	24	64.9
Asthma		
Yes	2	5.4
No	35	94.6
Diabetes mellitus		
Yes	3	8.1
No	34	91.9

One-third of participants (33.3%) reported experiencing lower urinary tract symptoms (LUTS) (Table 3). The most common specific symptom was back pain (70.4%) followed by difficulty in urination (37%), straining during urination (22.2%) and incomplete voiding (14.8%), which were less frequent. Other less common symptoms include erectile dysfunction (11.1%), bloody urine (3.7%) and inability to walk (3.7%).

Table 3: Prevalence of Lower Urinary Tract Symptoms among Participants (n = 81)

Presence of lower urinary tract symptoms (LUTS)	Frequency	Per cent (%)
Yes	27	33.3
No	54	66.7
(n = 27)		
Back Pain		
Yes	19	70.4
No	8	29.6
Difficulty in Urinating		
Yes	10	37
No	17	63
Straining During Urination		
Yes	6	22.2
No	21	77.8
Incomplete Voiding		
Yes	4	14.8
No	23	85.2
Erectile Dysfunction		
Yes	3	11.1
No	24	88.9
Inability to walk		
Yes	1	3.7
No	26	96.3
Bloody Urine		
Yes	1	3.7
No	26	96.3

The analysis in Table 4 demonstrated a significant association between respondents' age ($p = 0.002$), employment status ($p = 0.002$), monthly income ($p = 0.002$), blood pressure ($p = 0.033$) and

PSA level (p = 0.012) with the presence of lower urinary tract symptoms (LUTS)

Table 4: Chi-square Analysis of Respondents' Socio-demographic and Clinical Factors with Lower Urinary Tract Symptoms (n = 81)

	Lower Urinary Tract Symptoms (LUTS)		
Variables	**Yes (%)**	**No (%)**	**p-value**
Age			
<45	1(3.7)	19(35.2)	0.002*
46-60	13(48.1)	25(46.3)	
>60	13(48.1)	10(18.5)	
Level of Education			
None	1(3.7)	0(0)	0.093
Primary	11(40.7)	17(31.5)	
Secondary	14(51.9)	25(46.3)	
Tertiary	1(3.7)	12(22.2)	
Employment Status			
Employed	1(3.7)	6(11.1)	0.002*
Self-employed	19(70.4)	47(87)	
Unemployed	7(25.9)	1(1.9)	
Marital Status			
Married	25(92.6)	50(92.6)	0.741
Widower	2(40)	3(5.6)	
Divorced	0(0)	1(1.9)	
Monthly Income (Naira)			
None	7(25.9)	1(1.9)	0.002*
<Minimum Wage	11(40.7)	35(64.8)	
>Minimum Wage	9(33.3)	18(33.3)	
Blood Pressure			
Normal BP	0(0)	10(18.5)	0.033*
Elevated BP	4(14.8)	11(20.4)	
High BP	23(85.2)	33(61.1)	
PSA Level			
Normal PSA Level	17(63)	47(87)	0.012*
Elevated PSA Level	10(37)	7(12)	

*****Statistically significant, BP = Blood Pressure, PSA = Prostate-Specific Antigen

The regression analysis in Table 5 explored whether chronic conditions were associated with the presence of lower urinary tract symptoms (LUTS). Hypertension showed a borderline significant association. In the crude model, non-hypertensive men were less likely to report LUTS compared to hypertensives (COR = 0.438; 95% CI: 0.165–1.158; p = 0.096). After adjustment, this relationship reached statistical significance (AOR = 0.357; 95% CI: 0.128–0.999; p = 0.050), indicating that hypertensive men had about 64% higher odds of LUTS.

Peptic ulcer disease demonstrated no statistically significant relationship with LUTS in either the crude or adjusted models, though a non-significant trend towards reduced odds was observed (AOR = 0.292; p = 0.090). Similarly, diabetes mellitus showed no significant association (AOR = 0.203; p = 0.222), likely due to the small number of diabetic participants. Asthma produced unstable regression estimates with excessively wide confidence intervals, reflecting extremely sparse data for this sub-group; therefore, no reliable conclusions can be drawn.

Table 5: Factors Contributing to Lower Urinary Tract Symptoms using Regression Analysis

Variables	**COR (95% CI)**	**p-value**	**AOR (95% CI)**	**p-value**
Hypertension		0.096		0.050*
Yes	Ref		Ref	
No	0.438(0.165,1.158)		0.357(0.128,0.999)	
Peptic Ulcer Disease		0.118		0.090
Yes	Ref		Ref	
No	0.357(0.098,1.300)		0.292(0.070,1.213)	
Asthma		0.999		0.999
Yes	Ref		Ref	
No	838803939.060(0.000)		2029170538.432(0.000)	
Diabetes mellitus		0.247		0.222
Yes	Ref		Ref	
No	0.236(0.020,2.725)		0.203(0.016,2.620)	

***** Statistically significant

DISCUSSION

This study highlights the considerable burden of lower urinary tract symptoms (LUTS) among Nigerian men, with one-third of participants reporting at least one symptom. The prevalence observed (33.3%) is higher than the prevalence rate of 20.2% from south-eastern Nigeria (Nnabugwu *et a.,* 2019), but aligns with reports from other African settings such as Uganda and Tanzania, where community-based prevalence estimates range between 30% and 45% (Bajunirwe *et al*, 2018; Stothers *et al*, 2017). However, our prevalence is lower than the 59.1% reported by Ojewola *et al* (2016) among men in Ido/Osi Local Government Area of Ekiti State, south-western Nigeria. Our findings underscore that LUTS is not merely a hospital-based phenomenon but a significant community health concern in sub-Saharan Africa.

Age emerged as a strong determinant of LUTS with men above 45 years being disproportionately affected, and more significantly so among those aged 60 years and above. This is consistent with global evidence that both LUTS prevalence and severity increase with aging, driven by prostatic and vascular changes (Huang *et a.,* 2023). This could also be so because elderly people have more morbidities, suffer from overall physiological decline with age and are less able to access health care than younger populations (Bamigbala *et al,* 2022; Okoro *et al,* 2022; Bamigbala and Ojetunde, 2023; Bamigbala *et al,* 2024). These associations may also be explained by the age-related rise in prostatic bladder outlet obstruction caused by benign or malignant prostate enlargement (Drake *et al,* 2017), age-related changes in bladder function (Olapade-Olaopa *et al,* 2015), a higher prevalence of co-

morbidities and hormonal imbalance. Collectively, these findings emphasize the necessity for age-specific, patho-physiologically informed strategies in the clinical management of LUTS.

Socioeconomic determinants also played a role among the determining factors of LUTS in this study. Men with lower incomes and those self-employed or unemployed reported higher rates of LUTS, suggesting that economic constraints may delay healthcare access, worsen disease progression and further amplify symptom burden. This aligns with previous Nigerian research showing that low-income men often under-utilize urological services (Nnabugwu *et al.,* 2020).

In our study, we found a significant association between elevated PSA levels and the presence of LUTS among participants, even though prostatic enlargement was not assessed. Possible explanations include sub-clinical prostatitis or chronic prostatic inflammation, both of which are known to elevate PSA levels and contribute to urinary symptoms (Nepal *et al,* 2023). Vascular and metabolic factors such as hypertension and systemic inflammation may also play a role, given their established links with both LUTS and PSA variability (Omran *et al,* 2021).

In our study, hypertension independently predicts LUTS, with hypertensive men having about 64% higher odds of symptoms. This supports prior work suggesting shared vascular and autonomic mechanisms linking hypertension and urinary dysfunction (Maharajh *et al,* 2015). A previous study (Hwang *et al,* 2015) has shown that men with hypertension are more likely to have a higher International Prostatic Symptom Score (IPSS) and large prostate volume than men without hypertension. Hypertension contributes to systemic vascular changes, including impaired blood flow and endothelial dysfunction, which may affect the bladder and lower urinary tract (Andersson *et al,* 2017). Chronic ischemia of the bladder wall has been proposed as a mechanism leading to detrusor over-activity, reduced compliance and storage symptoms (Nomiya *et al,* 2014). Additionally, hypertension has been linked to metabolic syndrome, a condition associated with both irritative and obstructive LUTS, suggesting shared pathways involving oxidative stress, inflammation and smooth muscle dysfunction (Xu *et al,* 2022). These findings underscore the need for clinicians to adopt a holistic approach when evaluating men with LUTS, considering co-morbid cardiovascular risk factors.

Conclusion

This community-based study highlights the burden of lower urinary tract symptoms (LUTS) among men and demonstrates significant associations with advancing age and hypertension. Notably, LUTS was more prevalent in hypertensive men, who had approximately 64% higher odds of reporting symptoms compared to non-hypertensive participants. These findings suggest that beyond age-related changes, systemic co-morbidities such as hypertension play an important role in the development of LUTS. The results underscore the importance of integrating cardiovascular risk assessment into LUTS evaluation and management, particularly in resource-limited settings. Strengthening community-level screening programs and promoting multi-disciplinary care may enhance early detection, improve symptom control and reduce the long-term burden of LUTS among men in sub-Saharan Africa.

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