

# Assessment of lower urinary tract symptoms in Saudi men using the International Prostate Symptoms Score

Mostafa A. Arafa, Karim Farhat, Saad Aqdas, Mohamed Al-Atawi, Danny M. Rabah

Department of Surgery, Division of Urology, Uro-Oncology Research Chair, Faculty of Medicine, King Saud University, Riyadh, Saudi Arabia

## Abstract

**Background:** Benign prostatic hyperplasia-related lower urinary tract symptoms (LUTS) are common among older men, the incidence and prevalence are increasing rapidly, and they are associated with diminished health-related quality-of-life (QOL).

**Objective:** The aim was to describe the prevalence of LUTS in Saudi population and its relation to some other parameters.

**Subjects and Methods:** Saudi men over the age of 40 were invited to participate in the study; in Riyadh city from August 2012 through March 2013. All participants were assessed for the serum level of prostate-specific antigen (PSA) and digital rectal examination. Participants were given a linguistically validated Arabic version of the International Prostate Symptom Score (IPSS). Demographic and other medical comorbidities were assessed.

**Results:** Based on the IPSS, a subdivision of men into three symptoms classes has been proposed, resulting in groups with mild (1265, 58.3%), moderate (505, 27.3%), and severe symptoms (81, 4.4%) and the prevalence of moderate to severe was 31.7%. There was a weak, but significant correlation between the total IPSS and age, total prostate volume, and PSA. Severity of symptoms is increasing with increased age. Multiple regression analysis reported that prostate volume and all individual items of IPSS except straining were significant predictors of QOL and patient satisfaction, where frequency and incomplete emptying had the heaviest impact on patient's QOL.

**Conclusion:** LUTS were common among men in Saudi population over 40, the prevalence increases with age and most of them were displeased because of their urinary symptoms, poor QOL was mainly determined by individual symptoms; mainly frequency and incomplete emptying.

**Key Words:** Arab World, International Prostate Symptom Score, lower urinary tract symptom, prostate volume, quality of life

## Address for correspondence:

Dr. Karim Farhat, Department of Surgery, Division of Urology, Uro-Oncology Research Chair, Faculty of Medicine, King Khalid University Hospital, King Saud University, P.O. Box 7805, Riyadh, Saudi Arabia.

E-mail: kfarhat@ksu.edu.sa

Received: 30.07.2014, Accepted: 10.09.2014

## INTRODUCTION

The International Prostate Symptom Score (IPSS)

questionnaire is used worldwide to measure lower urinary tract symptoms (LUTS), and the Arabic version of the IPSS was validated in 2009.<sup>[1]</sup>

Benign prostatic hyperplasia (BPH)-related LUTS are common among older men, the incidence and prevalence of BPH and LUTS are increasing rapidly, they are associated with serious medical morbidities, an increased risk of falls, depression, diminished health-related quality of life (QOL), and billions of dollars in annual health care costs.<sup>[2,3]</sup> The prevalence of such conditions in the developing world

Access this article online	
Quick Response Code:	Website: www.urologyannals.com
	DOI: 10.4103/0974-7796.150492

particularly in the Arab countries is not clear, only two studies have been carried out in Iran and Turkey since 2008,<sup>[4,5]</sup> yet the information about men with LUTS living in the Gulf areas are not available.

Men with severe burden of LUTS often have measurable decrements in overall health-related QOL, which can be ameliorated by treatment. These patients seek medical advice for the bothersome LUTS, and the relief of symptoms and improvement in QOL are the most frequent indications for intervention.<sup>[6]</sup>

The main objective of the current study was to describe the prevalence of LUTS in Saudi population and its relation to some other parameters.

## SUBJECTS AND METHODS

The current study was conducted in Riyadh, Saudi Arabia, during the period August 2012 through March 2013. It was a cross-sectional study conducted on ambulatory Saudi patients presented to out-patient main university hospital clinics. Men over the age of 40 were invited to participate in the study; objectives and rationale of the study were described to them, and a written informed consent was taken from all men who agreed to participate in the field work in accordance to the Institutional Review Board approval.

The participants were interviewed by trained health care providers to obtain basic demographic information. All participants were also assessed for the serum level of prostate-specific antigen (PSA). Participants were given a linguistically validated Arabic version of the IPSS, whenever necessary assistance was provided. Participants underwent a digital rectal examination (DRE), and prostate size was measured by ultrasound. When either test was abnormal, multiple prostatic biopsies were performed. Those with confirmed findings of cancer prostate were managed accordingly.

The severity of LUTS was evaluated by IPSS and QOL. The questionnaire consisted of the Arabic – language translation of the IPSS, which included seven LUTS questions (incomplete emptying, frequency, intermittency, urgency, weak urinary stream, hesitancy, and nocturia) and one QOL question. Each symptom was scored as a value 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). A symptom score of 0-35 was calculated by adding the scores the patient gave to each of the seven symptoms. Next, the symptom scores were categorized into three levels of severity from “mild” to “severe” (0-7, mild; 8-19, moderate; and 20-35, severe). The QOL question was utilized to score the

overall discomfort to patients caused by their current urinary symptoms, 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).

## Exclusion criteria

Subjects who were known to have prostatic diseases, bladder tumor, bladder stone, urethral stricture or trauma to the lower urinary tract, subjects with neurological disorders were excluded from the study.

Statistical analyses were performed using SPSS, version 12.0 (SPSS Inc., Chicago, IL, USA) using one-way ANOVA, Chi-squared tests, multiple regression analysis, and Pearson correlation analysis.  $P < 0.05$  and  $P < 0.001$  were considered as statistically significant, respectively.

## RESULTS

The total number of subjects interviewed was 2180; those who remained in the final analysis were 1851; after exclusion of 88 persons did not meet the inclusion criteria, and 241 persons refused to do DRE or TRUS examination. Their age ranged from 42 to 90 years. On the basis of the IPSS, a subdivision of men into three symptoms classes has been proposed, resulting in groups with mild (1265, 58.3%), moderate (505, 27.3%) and severe symptoms (81, 4.4%) and the prevalence of moderate to severe was 31.7%.

The observed prevalence of individual LUTS indicated that nocturia was the most bothersome LUTS (70%) followed by frequency, incomplete emptying, and intermittency (47.8%, 43.8%, 39.2% respectively), while straining was the least frequent complaint (13.5%).

There was a strong correlation between the total IPSS and the score of QOL question ( $r = 0.69$ ,  $P = 0.0001$ ). The results reported that few were delighted (0.3%) and pleased (2.5%) about their urinary condition, those who felt mostly satisfied, mostly dissatisfied, unhappy, and terrible constituted 9.2%, 11.7%, 26.7%, and 28.3% respectively.

There was a weak, but significant correlation between the total IPSS and age, total prostate volume and PSA [Table 1].

Age was categorized into four categories, <50 years, from 50 to 60 years, from 61 to 70 years, and >70 years. Kruskal–Wallis test reported a significant variation between these categories in relation to the total IPSS (54.33,  $P = 0.001$ ). Mann–Whitney’s test for comparison reported a significant difference between men aged 50 and 60 years in comparison to men aged 61-70 years and men aged >70 years, the mean difference was greater between group 2 and group 4 [Table 2].

Severity of symptoms was tabulated across different age categories in Table 3 where severe symptoms were increased with increasing age, except for the age group <50 years. It was reported that in 7.3% of men aged <50 years, 3.4% in men aged 50-60 year, 4.4% in men aged 61-70 years and 7.1% in men aged >70 years the symptoms were severely expressed ( $P = 0.001$ ).

**Scores of individual symptoms**

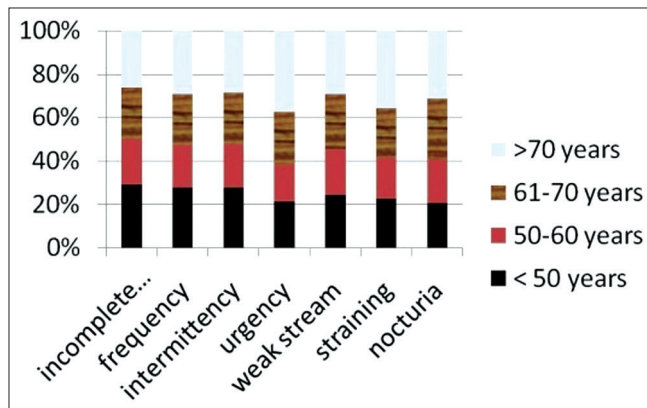
The distribution of the mean scores of the seven individual symptoms of the IPSS across different age categories was reported in Figure 1. There was a statistical significant difference between age categories with regards to the seven individual symptoms, except straining ( $P = 0.000$ ). The mean distribution for incomplete emptying, frequency, and intermittency was highest for the age group >70 years and <50 years, while, for urgency, weak stream and nocturia, the highest means were for the elder age groups (>60 years).

Multiple linear regression analysis reported that prostate volume and all individual items of IPSS except straining were significant predictors of patient satisfaction, where changes in the  $R^2$  reported that the frequency and incomplete emptying had the heaviest influence on patient's QOL [Table 4].

**DISCUSSION**

Assessment of LUTS is indispensable for physicians to make an accurate diagnosis treatment selection and efficacy evaluation in lower urinary tract disorders. For men complaining of LUTS; the IPSS questionnaire has often been used as the symptom assessment tool.<sup>[7-9]</sup> However, IPSS was originally designed for symptom assessment for BPH.<sup>[7]</sup> Since BPH is highly prevalent in any given male population from the fiftieth decade of life on, it demands high surveillance from health authorities.

The clinical practice of electing patients to surgical treatment based on clinical evaluation was strengthened by the acceptance of standard urological questionnaires allowing homogeneity



**Figure 1:** Scores of different lower urinary tract symptoms across age categories

and objectivity to multiple treatment options. The modern approach for the treatment of LUTS highly recommends the subjective perception from the patient as well as the presence of obstruction.

The present study reported that the prevalence of mild, moderate and severe LUTS was 58.3%, 27.3%, and 4.4% respectively. The overall prevalence of moderate to severe LUTS was 31.7%. The same results were nearly reported from Jeju Island<sup>[10]</sup> and from other older studies in Japan and Sweden.<sup>[11,12]</sup> Lower figures were reported from Singapore,<sup>[13]</sup> in different parts of Korea, and Kenya the reported incidence of LUTS is higher; >50%.<sup>[14,15]</sup> This could be ascribed to different culture, environment and nature of the diet.

**Table 1: Spearman correlation coefficient of total IPSS with different variables**

Parameter	Number	r	P
Age	1851	0.13	0.001
Total prostate volume	1851	0.11	0.001
PSA	1851	0.08	0.01
QOL	1851	0.69	0.001

PSA: Prostate-specific antigen, QOL: Quality of life, IPSS: International Prostate Symptom Score

**Table 2: Distribution of age categories according to the total IPSS score**

Age group (years)	Number (%)	Total IPSS (mean±SE)
<50	123 (6.6)	6.51±0.61
50-60	966 (52.2)	5.28±0.18
61-70	566 (30.6)	6.57±0.26
>70	196 (10.6)	8.14±0.49

IPSS: International Prostate Symptom Score, SE: Standard error

**Table 3: Prevalence of LUTS severity across different age groups**

Age categories	Mild symptoms (%)	Moderate symptoms (%)	Severe symptoms (%)	Total (%)
<50 years	78 (63.4)	36 (29.3)	9 (7.3)	123 (6.6)
50-60 years	711 (73.6)	222 (23)	33 (3.4)	966 (52.2)
61-70 years	371 (65.5)	170 (30)	25 (4.5)	566 (30.6)
>70	105 (53.6)	77 (39.3)	14 (7.1)	196 (10.6)
Total	1265	505	81	1851

LUTS: Lower urinary tract symptoms

**Table 4: Results of multiple linear regression analysis**

Model	Standardized coefficients Beta	t	P
Incomplete emptying	-0.208	-8.496	0.000
Frequency	-0.140	-5.539	0.000
Intermittency	-0.095	-3.759	0.000
Urgency	-0.168	-7.859	0.000
Weak stream	-0.171	-7.379	0.000
Straining	0.007	0.352	0.725
Nocturia	-0.218	-9.548	0.000
PSA	-0.023	-1.215	0.225
Age	0.002	0.087	0.931
Prostate size	-0.050	-2.538	0.011

PSA: Prostate-specific antigen

It is known that age, prostate volume, BMI and other comorbidities are correlated to LUTS, in our study age, prostate volume and PSA were only addressed. A positive and good correlation was reported between total IPSS and QOL score, on the other hand, such correlation was very weak with age, prostate volume and total PSA. The mean of the total IPSS and also the severity of symptoms were increasing with increased age, paradoxically, the figures for the age group <50 years were different. The impact of age on LUTS was also revealed from different studies that reported a linear association.<sup>[13,16-18]</sup> With regards to prostate volume, it was reported that the larger the prostate volume, the higher the LUTS severity scores, where prostate positively correlated with nocturia and incomplete emptying,<sup>[19]</sup> while Agrawal *et al.* reported no correlation between IPSS and prostate volume and age.<sup>[20]</sup>

Lower urinary tract symptoms have a negative impact on patients' QOL. The present study, like other studies,<sup>[20,21]</sup> revealed a significant and good correlation between LUTS and patients' QOL, which indicates a clinical relevance. Patients' urinary symptoms were reflected on their QOL where most of them were displeased or dissatisfied. The results of multiple regressions reported that frequent urination and incomplete emptying were the most significant factors that have the heaviest impact on patients' QOL, other factors like prostate volume and individual symptoms, except straining have a significant but less influential role. Many studies have indicated that poor patients' QOL was associated with increased symptoms severity.<sup>[13,16,22]</sup> Other results reported that among subunits of IPSS, the nocturia score contributed most to the severity of LUTS and had the highest correlation with a QOL score suggesting that nocturia increased more rapidly with age than other subunits of LUTS which has a great effect on the QOL.<sup>[10]</sup> Storage LUTS (nocturia and frequent urination) were the most bothersome LUTS in the current study. While, in the clinical practice, LUTS in men are commonly treated with medical therapies designed to alleviate prostatic enlargement, the results of this study support the concept that the treatment of male LUTS should include medical therapies designed to relieve the storage symptoms targeting the bladder dysfunction. The results of the current study coincide with other findings that indicated that most of the LUTS symptoms were more prevalent in the older age group and the prevalence is increasing with increasing age.<sup>[16,21,23]</sup> EPIC study indicated that the prevalence of all LUTS increased with age among men with overactive bladder (OAB) symptoms. Number of LUTS and mean IPSS increased with age; the proportion reporting moderate to severe LUTS was higher than the general population.<sup>[24]</sup>

Male LUTS are extremely common. Male LUTS are often associated with histological BPH, prostate enlargement and measurable obstruction. For many reasons, measures of these conditions do not correlate high at baseline. However, there

are strong correlations between some baseline measures and changes or outcomes over time, which are clinically useful and allow for differentiated treatment assignments.

## CONCLUSION

Lower urinary tract symptoms were common among men in Saudi population over 40, the prevalence increases with age and most of them were displeased because of their urinary symptoms, poor QOL was mainly determined by individual symptoms; mainly frequency and incomplete emptying. Ageing of the population may lead to increased number of men experiencing LUTS and increase medication cost. It is of great importance to realize that the impact of symptoms on the reported QOL is pronounced.

## Limitations of the study

There are limitations when enrolling voluntary participants. Nevertheless, given the large socioeconomic cost and difficulties encountered in sampling and collecting data in such epidemiological studies, we believed our sample would be a representative one. We could not measure urodynamic parameters for all patients, there were many missed cases, hence they were removed from the final analysis.

International Prostate Symptom Score is biased toward voiding symptoms (four questions) versus storage symptoms (three questions). A more comprehensive evaluation of LUTS in men should include a more wide evaluation of storage symptoms; OAB questionnaire. Furthermore, although the IPSS represents the backbone of our current metrics of symptom evaluation, it has another limitation: It has only one question on "bothersomeness," also LUTS severity may have been underestimated by the IPSS, which does not assess incontinence.

## ACKNOWLEDGMENT

This project was supported by King Saud University, Deanship of Scientific Research, Research Chair.

## REFERENCES

1. Hammad FT, Kaya MA. Development and validation of an Arabic version of the International Prostate Symptom Score. *BJU Int* 2010;105:1434-8.
2. Parsons JK. Benign prostatic hyperplasia and male lower urinary tract symptoms: Epidemiology and risk factors. *Curr Bladder Dysfunct Rep* 2010;5:212-8.
3. Chokkalingam AP, Yeboah ED, Demarzo A, Netto G, Yu K, Biritwum RB, *et al.* Prevalence of BPH and lower urinary tract symptoms in West Africans. *Prostate Cancer Prostatic Dis* 2012;15:170-6.
4. Safarinejad MR. Prevalence of benign prostatic hyperplasia in a population-based study in Iranian men 40 years old or older. *Int Urol Nephrol* 2008;40:921-31.
5. Oztürk A, Serel TA, Kosar A, Kecelioglu M. Prevalence of benign hypertrophy of the prostate in Turkish men hospitalized in urology. *Prog Urol* 2000;10:568-70.



6. Chuang FP, Lee SS, Wu ST, Yu DS, Chen HI, Chang SY, *et al.* Change in International Prostate Symptom Score after transurethral prostatectomy in Taiwanese men with benign prostate hyperplasia: Use of these changes to predict the outcome. *Arch Androl* 2003;49:129-37.
7. Barry MJ, Fowler FJ Jr, O'Leary MP, Bruskewitz RC, Holtgrewe HL, Mebust WK, *et al.* The American Urological Association symptom index for benign prostatic hyperplasia. The Measurement Committee of the American Urological Association. *J Urol* 1992;148:1549-57.
8. Chapple C, Herschorn S, Abrams P, Sun F, Brodsky M, Guan Z. Tolterodine treatment improves storage symptoms suggestive of overactive bladder in men treated with alpha-blockers. *Eur Urol* 2009;56:534-41.
9. Moore KN, Valiquette L, Chetner MP, Byrniak S, Herbison GP. Return to continence after radical retropubic prostatectomy: A randomized trial of verbal and written instructions versus therapist-directed pelvic floor muscle therapy. *Urology* 2008;72:1280-6.
10. Huh JS, Kim YJ, Kim SD. Prevalence of Benign Prostatic Hyperplasia on Jeju Island: Analysis from a Cross-sectional Community-based Survey. *World J Mens Health* 2012;30:131-7.
11. Tsukamoto T, Kumamoto Y, Masumori N, Miyake H, Rhodes T, Girman CJ, *et al.* Prevalence of prostatism in Japanese men in a community-based study with comparison to a similar American study. *J Urol* 1995;154:391-5.
12. Andersson SO, Rashidkhani B, Karlberg L, Wolk A, Johansson JE. Prevalence of lower urinary tract symptoms in men aged 45-79 years : Apopulation-based study of 40 000 Swedish men. *BJU Int* 2004;94:327-31.
13. Chong C, Fong L, Lai R, Koh YT, Lau WK, Hartman M, *et al.* The prevalence of lower urinary tract symptoms and treatment-seeking behaviour in males over 40 years in Singapore: A community-based study. *Prostate Cancer Prostatic Dis* 2012;15:273-7.
14. Lee E, Yoo KY, Kim Y, Shin Y, Lee C. Prevalence of lower urinary tract symptoms in Korean men in a community-based study. *Eur Urol* 1998;33:17-21.
15. Campbell B. High rate of prostate symptoms among Ariaal men from Northern Kenya. *Prostate* 2005;62:83-90.
16. Sonke GS, Kolman D, de la Rosette JJ, Donkers LH, Boyle P, Kiemeny LA. Prevalence of lower urinary tract symptoms in men and its influence on their quality of life: Boxmeer Study. *Ned Tijdschr Geneesk* 2000;144:2558-63.
17. Koskimäki J, Hakama M, Huhtala H, Tammela TL. Prevalence of lower urinary tract symptoms in Finnish men: Apopulation-based study. *Br J Urol* 1998;81:364-9.
18. Lee SH, Kim JC, Lee JY, Kim JH, Oh CY, Lee SW, *et al.* Effects of obesity on lower urinary tract symptoms in Korean BPH patients. *Asian J Androl* 2009;11:663-8.
19. Chung JH, Yu JH, Sung LH, Noh CH, Chung JY. Effect of prostatitis on lower urinary tract symptoms: Retrospective analysis of prostate biopsy tissue. *Korean J Urol* 2012;53:109-13.
20. Agrawal CS, Chalise PR, Bhandari BB. Correlation of prostate volume with international prostate symptom score and quality of life in men with benign prostatic hyperplasia. *Nepal Med Coll J* 2008;10:104-7.
21. Teh GC, Sahabudin RM, Lim TC, Chong WL, Woo S, Mohan M, *et al.* Prevalence of symptomatic BPE among Malaysian men aged 50 and above attending screening during prostate health awareness campaign. *Med J Malaysia* 2001;56:186-95.
22. Fujimura T, Kume H, Nishimatsu H, Sugihara T, Nomiya A, Tsurumaki Y, *et al.* Assessment of lower urinary tract symptoms in men by international prostate symptom score and core lower urinary tract symptom score. *BJU Int* 2012;109:1512-6.
23. Bosch JL, Hop WC, Kirkels WJ, Schröder FH. The International Prostate Symptom Score in a community-based sample of men between 55 and 74 years of age: Prevalence and correlation of symptoms with age, prostate volume, flow rate and residual urine volume. *Br J Urol* 1995;75:622-30.
24. Irwin DE, Milsom I, Kopp Z, Abrams P, Artibani W, Herschorn S. Prevalence, severity, and symptom bother of lower urinary tract symptoms among men in the EPIC study: Impact of overactive bladder. *Eur Urol* 2009;56:14-20.

**How to cite this article:** Arafa MA, Farhat K, Aqdas S, Al-Atawi M, Rabah DM. Assessment of lower urinary tract symptoms in Saudi men using the International Prostate Symptoms Score. *Urol Ann* 2015;7:221-5.

**Source of Support:** Medicine Research Center, Deanship of Scientific Research, King Saud University, **Conflict of Interest:** None.