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Can new, improvised Visual Prostate Symptom Score replace the International Prostate Symptom Score? Indian perspective

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Abstract

Introduction: Visual Prostate Symptom Score (VPSS) was introduced to overcome the drawbacks of the International Prostate Symptom Score (IPSS). However, this score also has potential for improvement.
Materials and Methods: The primary objective of this study was to evaluate the utility of VPSS in patients with benign enlarged prostate (BEP) after uroflowmetric validation of the stream component. The secondary objective was to improve VPSS by adding a new severity grading and to assess if the "new upgraded VPSS" can replace IPSS in terms of ease of completion without assistance and the time taken.
Results: Of 115 patients, 42.60% of them were of thea age group between 61– 70 years; mean ± standard deviation age was 64.75 years ± 8.042 (range 48– 90 years). Nineteen (16.52%) patients, who had education level ≥10th grade completed
IPSS without assistance.. One hundred and eight (93.91%) patients completed VPSS without assistance ($P = 0.000$). None of those (0/6) with no formal education (but able to read and write) could complete the IPSS without assistance, whereas 66.67% completed the VPSS without assistance. Six minutes and two minutes was the average time taken to complete IPSS (4– 10 min) and VPSS (1– 3 min), respectively. Responses to different variables of VPSS were statistically significant ($P < 0.001$) compared to the IPSS. Correlation between the severity grading of the two scores was statistically significant ($P < 0.001$), with a statistically significant positive correlation between VPSS and IPSS ($r = +0.582$, $P < 0.001$). The new severity grading system developed on par with the IPSS, improvising the existing VPSS, showed statistically significant positive correlation to the IPSS ($r = +0.587$, $P < 0.001$).
Conclusions : VPSS correlated well with IPSS. The "new improvised VPSS" developed by incorporating severity grading is a potential tool that can replace IPSS by overcoming its limitations.

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Introduction

Benign prostatic hyperplasia (BPH), a common condition in aging men, is a concern due to its impact on quality of life (QoL) of the patient. Lower urinary tract symptoms (LUTS) are a frequent accompanier (15%–30%) of BPH.[1] Initial assessment is based on the subjective parameters, which may vary among individuals (e.g. poor stream). BPH being a histological term, the clinical terminology of the same is benign enlarged prostate (BEP). It is necessary to follow standard assessment parameter (s) to chart out the management strategies. The International Prostate Symptom Score (IPSS) with seven components was developed by the American Urological Association;[2],[3],[4] later, it was adapted by the World Health Organization for the assessment of BPH. The IPSS modification came up with a QoL component, patient's emotional component, enhancing its utility [Supplementary Figure 1].

International Prostate Symptom Score (I-PSS)

Patient Name: _____ **Date of birth:** _____ **Date completed** _____

In the past month:	Not at All	Less than 1 in 5 Times	Less than Half the Time	About Half the Time	More than Half the Time	Almost Always	Your score
1. Incomplete Emptying How often have you had the sensation of not emptying your bladder?	0	1	2	3	4	5	
2. Frequency How often have you had to urinate less than every two hours?	0	1	2	3	4	5	
3. Intermittency How often have you found you stopped and started again several times when you urinated?	0	1	2	3	4	5	
4. Urgency How often have you found it difficult to postpone urination?	0	1	2	3	4	5	
5. Weak Stream How often have you had a weak urinary stream?	0	1	2	3	4	5	
6. Straining How often have you had to strain to start urination?	0	1	2	3	4	5	
	None	1 Time	2 Times	3 Times	4 Times	5 Times	
7. Nocturia How many times did you typically get up at night to urinate?	0	1	2	3	4	5	
Total I-PSS Score							

Score: 1-7: *Mild* 8-19: *Moderate* 20-35: *Severe*

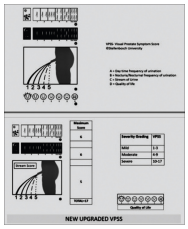
Quality of Life Due to Urinary Symptoms	Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible
If you were to spend the rest of your life with your urinary condition just the way it is now, how would you feel about that?	0	1	2	3	4	5	6

Supplementary Figure 1: International Prostate Symptom Score

IPSS is a documentation of patients' symptoms for the last 4 weeks/1 month, which, in turn, depends on the recall capacity of an individual. Besides, the scoring components in IPSS warrant higher mathematical calculations by an individual, which is cumbersome and requires a minimum education level. The minimum education level required to interpret/understand and complete IPSS chart is = 6th standard according to the education system of the United States of America.[5] The standard of education varies from country to country and hence, universalization of minimum education standards becomes difficult. In most of the developing countries, patients need assistance to complete the IPSS chart. This assistance could be drawn from the staff nurse, the treating physician, the technician, or the patient's caregiver, where bias of their understanding and interpretation becomes prominent.[6] In addition, completion of the IPSS chart is time-consuming because of the complexity and the requirement of assistance, necessitating the need to develop a simpler scoring system.

The Visual Prostate Symptom Score (VPSS) introduced in 2011 by van der Walt *et al*.[7] to overcome the drawbacks of IPSS (vision and cognitive impairment),[8] is a pictorial representation [Figure 1] of the urinary frequency during daytime and nighttime, the stream of urine, and the QoL. The original VPSS shows "stream of urine" pictorially, which has arbitrary values from 1 to 5. The VPSS does not have the limitations pertaining to the language, the level of education, is easy to interpret and complete as there is no mathematical calculations and decimal conversions involved.

Figure 1: Comparison of existing Visual Prostate Symptom Score with the new improvised Visual Prostate Symptom Score (Visual Prostate Symptom Score



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The IPSS has three storage symptoms (frequency, urgency, and nocturia) and four voiding symptoms (poor stream, straining to void, intermittency, and sense of incomplete voiding), whereas VPSS has two storage symptoms (daytime and nighttime frequency of urination) and one voiding symptom (stream of urine).

Completing IPSS is a challenge among our patients with limited educational background. The data on VPSS and its comparison in Indian patients with BEP are limited. We conducted this study to evaluate the clinical utility of VPSS in Indian patients with BEP compared to IPSS, and assess whether the former can replace the latter.

Materials and Methods

This study was conducted by the department of urology in a tertiary care teaching hospital over a period of 3 years from March 2014 to February 2017, after obtaining approval from the institutional ethics committee. Prospective patients were screened after obtaining written informed consent in a language in which the patients were fluent to read and understand.

The aim of the study was to confirm the clinical utility of VPSS in Indian patients with symptoms of BEP and develop a new severity grading system, to improve/upgrade the existing VPSS. The IPSS was translated into vernacular languages and was validated.

The primary objective was to evaluate the clinical utility of VPSS in Indian men with BEP after objective validation of the stream score of urination by using maximum flow rate in mL/s (Q_{max}) and average flow rate in mL/s (Q_{avg}) of uroflowmetric data and correlate VPSS with IPSS. The secondary objective was to introduce a new severity grading system for VPSS to upgrade the existing VPSS to assess if "new improvised VPSS" [Figure 1] can replace IPSS in the Indian subcontinent in terms of ease of VPSS chart completion with or without assistance across the educational standards and time taken to complete VPSS and IPSS.

We screened patients from the patient pool visiting hospitals attached to our institution. This included three centers, one of which is a district-level government hospital. All the three centers are within the city in a radius of ≈1–2 km, from each other. Our outpatient departments cater to the needs of 60–80 patients/day on an average.

We included all patients who presented with symptoms attributable to BEP, in whom the urine analysis was within normal limits and had sterile cultures. Those with stricture urethra, previous urethral/prostatic surgery, neurological causes of bladder outlet obstruction, serum prostate-specific antigen >4 ng/mL, voided volume of urine <150 mL, previous pelvic irradiation, bladder calculi, cystitis/urinary tract infection, diabetes mellitus, and carcinoma bladder were excluded from the study.

After obtaining demographical details and medical history from the patients, they were provided with charts (IPSS and VPSS) to complete. Physical examination, followed by uroflowmetry (Status Medical Equipments, Satara, Maharashtra, India), by UROCOMP 2000 (model), gravimetric-type V_{mic} sensor – Weight-type method were performed. Calibration was done as per the software provided in the user manual. Ultrasonogram abdomen and pelvis was performed to rule out calculus and to measure the postvoid residual urine.

Patients' educational status, time taken to complete the IPSS and VPSS, any assistance required to complete the charts, and Q_{max} and Q_{avg} were noted.

In our study, we intended to coin a new term "stream score" for the image showing stream of urine in VPSS. We attempted to add a new severity grading system to VPSS, akin to IPSS (mild, moderate, and severe) to improvise the existing VPSS. Hence, the new improvised VPSS is the addition of "stream score" and severity grading to the existing VPSS. The Stream score has been validated by correlating it with uroflowmetry data, namely Q_{max} and Q_{avg}, and has shown positive correlation with statistically significant *P* value.

Stream score calculation

VPSS shows stream of urine pictorially, which has values ranging from 1 to 5, depending on the patient's perception of his stream of urine. By applying the stream score, Score 1 represents optimal stream, while score 5 represents poor stream. The poorer the stream, the higher is the stream score, indicating an inverse correlation between the two.

In VPSS, daytime and nighttime frequency each has a score of 1–6 and stream score has values from 1 to 5. The maximum total score will be 17.

Severity grading system

The IPSS has an established severity grading system, namely mild (score 1–7), moderate (score 8–19), and severe (score 20–35). However, the existing VPSS lacks a severity grading, hence, we have come up with a new severity grading system, akin to IPSS, with mild (score 1–3), moderate (score 4–9), and severe (score 10–17) [Figure 1].

Statistical analysis

The Sample size for the study was calculated by the following formula:

$n = 2(z\,\alpha + z\,\beta)^2/c^2$

$c = 0.5\ln[1 + r/1 - r]$

where r is correlation coefficient = 0.354

$z\,\alpha$ =1.96 at 95% confidence interval

$z\,\beta$ =0.84 at 80% power.

Data were collected on a pre-approved pro forma, transferred to Microsoft Excel worksheets (2007), and analyzed after double checking the data entry. The collected data were summarized by frequency and percentage. Chi-square test, Fisher's exact test, and binominal test were used to find significant difference with respect to categorical data. Pearson's correlation was used for correlation analysis between components, where "*r*" is correlation coefficient, which could be either positive or negative. Tables and figures were used as appropriate. $P < 0.05$ was taken statistically significant.

Results

One hundred and fifteen patients satisfying the selection criteria were included in the study. Majority of the study population were in the age group of 61–70 years (n = 49/115, 42.60%), followed by those in 51–60 years' age group (n = 33/115, 28.69%). The mean ± standard deviation age at presentation was 64.75 years ± 8.042 (range: 48–90 years).

Only 19 of the 115 patients (16.52%) were able to complete the IPSS without help. All these 19 patients had education of ≥10th grade. On the contrary, 108 (93.91%) patients completed the VPSS without assistance. There was a statistically significant difference between those who completed IPSS and VPSS without assistance (P = 0.000) [Table 1].

Table 1: Comparison of completion of International Prostate Symptom Score and Visual Prostate Symptom Score with different levels of education

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We classified patients into three groups based on their education. Of these, none (0/6) with non-formal education (able to read and write) could complete IPSS without assistance, whereas four of six (66.67%) patients completed VPSS without assistance [Table 1].

The average time taken by the patients to complete IPSS was 6 min (4–10 min), while the same for VPSS was 2 min (1–3 min), and the difference was statistically significant ($P < 0.05$). When the response for different variables of the two scoring systems was considered, that for the VPSS was statistically significant ($P < 0.001$) [Table 2] and [Table 3].

Table 2: Comparison of responses to different components of International Prostate Symptom Score and Visual Prostate Symptom Score

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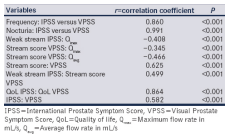

Variables	r=correlation coefficient	P
Frequency: IPSS versus VPSS	0.860	<0.001
Nocturia: IPSS versus VPSS	0.991	<0.001
Weak stream IPSS: Q_{max}	−0.408	<0.001
Stream score VPSS: Q_{max}	−0.345	<0.001
Stream score VPSS: Q_{avg}	−0.466	<0.001
Stream score: VPSS	0.625	<0.001
Weak stream IPSS: Stream score VPSS	0.499	<0.001
QoL IPSS: QoL VPSS	0.864	<0.001
IPSS: VPSS	0.582	<0.001

IPSS=International Prostate Symptom Score, VPSS=Visual Prostate Symptom Score, QoL=Quality of life, Q_{max}=Maximum flow rate in mL/s, Q_{avg}=Average flow rate in mL/s

Table 3: Comparison of responses to different components of International Prostate Symptom Score and Visual Prostate Symptom Score

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Grading with VPSS was correlated with IPSS grading. The correlation of severity grading between IPSS and VPSS was statistically significant ($P < 0.001$) [Table 4].

Severity grading	IPSS	VPSS
Mild	1-7	1-3
Moderate	8-19	4-9
Severe	20-35	10-17

r=−0.587, P=<0.001, IPSS=International Prostate Symptom Score, VPSS=Visual Prostate Symptom Score

Table 4: Severity grading according to the International Prostate Symptom Score and Visual Prostate Symptom Score

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VPSS has showed statistically significant positive correlation with IPSS in the study population (r = +0.582, P = <0.001) [Figure 2].

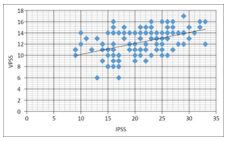

Figure 2: Graph showing the positive and linear correlation between Visual Prostate Symptom Score and International Prostate Symptom Score

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Discussion

Assessment of patients with LUTS, either storage or voiding symptoms or both, resulting from prostatic or non-prostatic causes (such as stricture urethra) by IPSS, is purely a symptom-based comprehensive scoring. However, the IPSS has certain limitations; a) requirement to recall the symptoms of the previous 4 weeks, b) certain level of understanding and intellect is required as IPSS questionnaire involves conversion of the symptoms into numerical fractions to mark the score. These abilities tend to decrease with aging. Also, the conversion into fractions varies with the same scores but in different scenarios, which may be confusing, particularly for the elderly. Basic education required for understanding the questionnaire is another major limitation in developing countries including India.[5] VPSS is an improved scoring system aimed at simpler symptom assessment in BEP.

Since its introduction in 2011, VPSS is used globally to assess LUTS, is validated and has been found to correlate well with IPSS.[7],[9],[10],[11],[12],[13],[14],[15] The clinical utility of VPSS has been documented internationally. It is found to be useful in patients with lower levels of education.[16] The pictorial representation helps in easy understanding and completion of the chart without assistance.[17],[18] Ability to complete the chart without assistance is most helpful for patients with limited education and in places with limited resources.[19] VPSS has been used in the Indian population,[20] and found to be useful for the people residing in rural areas, and illiterates, or those with lesser education.[21] Also, there is a suggestion that VPSS can replace IPSS to evaluate LUTS in elderly men.[22]

A pitfall of IPSS is its complexity which is seen in our study; only 19 patients could complete the IPSS without assistance compared to 108 who completed the VPSS without assistance. Also, those who completed the IPSS had education level ≥10th standard. Our observations confirm that a minimum education level of 10th standard is required to complete the IPSS questionnaire without assistance, supporting the fact that basic education is necessary to understand and interpret it. All patients with no formal education required assistance to complete the IPSS (100%), whereas 66.67% completed VPSS without assistance, indicating the complexity of IPSS. Although the number is less (n = 06), these findings support the utility of VPSS in patients with no formal education. Previous studies also have reported that a higher proportion of patients were unable to complete the IPSS (33.50%) themselves;[23],[24] this proportion was greater (83.48%) in our study. Studies have shown that formal education is required to understand the complexity of IPSS and those with lower educational level of elementary school may not be able to complete the form (34.0%), however, a significant difficulty may be experienced by those with higher levels of education also (≥7th standard, ≥10th standard).[7],[25] these findings are reflected in our study as well.

Language barrier in understanding IPSS is well documented.[14] We translated the questionnaire into the vernacular language. VPSS, on the other hand, is independent of linguistic limitations due to its pictorial representation, which makes it easy to understand.

Misreporting of IPSS, if administered to patients with an education level <6th grade, is high. On the other hand, completion of VPSS was easy, and 93.91% of the patients completed without assistance (P = 0.000). These observations support the use of VPSS in the less educated population, and as a greater proportion of our elderly patients have lower educational levels they may be better evaluated with VPSS rather than IPSS.

A similar study on the usefulness of VPSS in population with great language diversity and limited education has been reported from Namibia.[14] The population we recruited was from a region with high literacy rate. We used translated versions of questionnaires in our study. However, a greater proportion of our patients could not complete the IPSS without assistance as compared to that in Namibia.

Our study revealed that less time is required to complete VPSS (1-3 minutes) compared to that for IPSS (4-10 minutes). Wessels and Heyns[11] also reported that less time is required to complete the VPSS (118 s vs. 215 s). This is of particular interest in institutions with busy clinical schedule and allows for rapid evaluation on men with LUTS.

We noted a statistically significant positive correlation between IPSS and VPSS. Previous reports have shown negative correlations in variables such as frequency, nocturia, weak stream, weak stream: stream score, and QoL showed a positive correlation, whereas weak stream: Q_{max} and weak stream: Q_{avg}.[7],[10],[11],[14],[15],[18],[22],[26] Memon and Ather[17] had shown a negative correlation between Q_{max} and VPSS.

VPSS was found to be a better assessment tool in our patients than the IPSS. The correlation between severity grading between IPSS and VPSS was positive and statistically significant (P < 0.001).

With questions about the practical application of IPSS,[24] VPSS offers advantages such as less bias, easy completion by those with limited education, and minimal or no requirement of assistance, making it more acceptable in evaluating a patient with BEP. As there are very few urologists available in the country, even a general practitioner can complete the evaluation using VPSS. It can prove useful in primary health care centers where the patients can be evaluated with ease and based on the results, a patient can be referred for further management, if required.

An important limitation of IPSS is the fact that a bias is introduced when the IPSS questionnaire is completed by others, even by the caregivers. Misinterpretation of IPSS in Indian patients was reported by Jindal *et al*.[27] Our study supports the observation that pictorial representation of symptoms by VPSS help patients to complete the form without assistance, resulting in less/minimal bias. Our study further confirmed that VPSS is a reliable tool for symptom assessment in patients with BEP and correlates well with IPSS ($p < 0.001$).

We introduced the term "stream score" to the same picture of VPSS, after validating it with uroflowmetric data of Q_{max} and Q_{avg}. In the existing VPSS, stream of urination has a score of 1–5 depending on the patient's perception of his urine stream. The scoring is arbitrary and bound to be influenced by subjective variation in individual perception. Hence, we opine that coining the new term "stream score," which is objective, is necessary to upgrade the existing VPSS, and can convert it from a subjective score to an objective evaluation.

We suggested a three-tier severity grading system (mild, moderate, and severe) for VPSS, similar to the IPSS, and it has proved reliable in our patients, with good correlation. The new severity grading system is an improvisation of the existing VPSS. The new improvised VPSS showed statistically significant correlation to the severity grading of IPSS ($p < 0.001$). Setthawong *et al*.[16] in 2018 suggested that VPSS scores may be used to indicate mild (≤6), moderate (7–13), and severe symptoms (≥14); but, we found a lower range for our patients for the same classification with VPSS scores: 1–3 for mild and 4–9 and 10–17 suggestive of moderate and severe symptoms, respectively.

Clarity of images and requirement of additional images (urgency) has been stated as a minor drawback.[18] However, none of our patients complained, but we too agree with these suggestions based on our clinical experience.

This is a single-center study (with three subcenters) and thus the results may not be generalizable. Improvisation of the VPSS by incorporating the severity grading needs further validation. In addition, superiority studies may help in deciding the clinical utility of VPSS and its ability to replace IPSS. There are certain advantages of VPSS that it is easy to complete because of its pictorial representation format, and is independent of linguistic barrier, intellect, and recall ability of an individual compared to the IPSS. It is also less time-consuming and at the same time, the chance of assistance bias is minimal.

Conclusions

VPSS correlated well with the IPSS; the latter, due to its complexity, has limitations in the elderly patients with lower education levels. VPSS overcomes these limitations and is a practical option in centers with limited resources. We suggest a severity grading for VPSS for better clarity. The new improvised VPSS is a promising potential tool that can replace IPSS and can overcome its limitations such as the need of educational standards and can be easily complete in Indian patients.

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References

1. Thorpe A, Neal D. Benign prostatic hyperplasia. Lancet 2003;361:1359-67.
2. 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.
3. Barry MJ, Williford WO, Chang Y, Machi M, Jones KM, Walker-Corkery E, *et al*. Benign prostatic hyperplasia specific health status measures in clinical research: How much change in the American Urological Association symptom index and the benign prostatic hyperplasia impact index is perceptible to patients? J Urol 1995;154:1770-4.
4. Lukacs B, Grange JC, Comet D. One-year follow-up of 2829 patients with moderate to severe lower urinary tract symptoms treated with alfuzosin in general practice according to IPSS and a health-related quality-of-life questionnaire. BPM Group in General Practice. Urology 2000;55:540-6.
5. MacDiarmid SA, Goodson TC, Holmes TM, Martin PR, Doyle RB. An assessment of the comprehension of the American Urological Association Symptom Index. J Urol 1998;159:873-4.

6. Johnson TV, Abbasi A, Ehrlich SS, Kleris RS, Schoenberg ED, Owen-Smith A, *et al*. Patient misunderstanding of the individual questions of the American Urological Association symptom score. J Urol 2008;179:2291-4.

7. van der Walt CL, Heyns CF, Groeneveld AE, Edlin RS, van Vuuren SP. Prospective comparison of a new Visual Prostate Symptom Score versus the International Prostate Symptom Score in men with lower urinary tract symptoms. Urology 2011;78:17-20.

8. 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.

9. Descazeaud A, Coloby P, Davin JL, De La Taille A, Karsenty G, Kouri G, *et al*. Validation of Visual Prostate Symptom Score, VPSS, in the evaluation of lower urinary tract symptoms associated with benign prostatic hyperplasia (550 patients). Prog Urol 2017;27:176-83.

10. Ceylan Y, Gunlusoy B, Degirmenci T, Kozacioglu Z, Bolat D, Minareci S. Is new Visual Prostate Symptom Score useful as International Prostate Symptom Score in the evaluation of men with lower urinary tract symptoms? A prospective comparison of 2 symptom scores in Turkish society. Urology 2015;85:653-7.

11. Wessels SG, Heyns CF. Prospective evaluation of a new Visual Prostate Symptom Score, the International Prostate Symptom Score, and uroflowmetry in men with urethral stricture disease. Urology 2014;83:220-4.

12. Guzelsoy M, Aydos MM, Coban S, Turkoglu AR, Acibucu K, Demirci H. Comparison of the effectiveness of IPSS and VPSS without any help in LUTS patients: A prospective study. Aging Male 2018;21:193-9.

13. Afriansyah A, Gani YI, Nusali H. Comparison between Visual Prostate Symptom Score and International Prostate Symptom Score in males older than 40 years in rural Indonesia. Prostate Int 2014;2:176-81.

14. Heyns CF, Steenkamp BA, Chiswo J, Stellmacher GA, Förtsch HE, Van der Merwe A. Evaluation of the Visual Prostate Symptom Score in a male population with great language diversity and limited education: A study from Namibia. S Afr Med J 2014;104:353-7.

15. Park YW, Lee JH. Correlation between the Visual Prostate Symptom Score and International Prostate Symptom Score in patients with lower urinary tract symptoms. Int Neurourol J 2014;18:37-41.

16. Setthawong V, Mahawong P, Pattanachindakun N, Amnattrakul P, Dar FM, Thanavongvibul S. To investigate the correlation between the Visual Prostate Symptom Score, the International Prostate Symptom Score, and uroflowmetry parameters in adult Thai males of different educational levels. Prostate Int 2018;6:115-8.

17. Memon MA, Ather MH. Relationship between visual prostate score (VPSS) and maximum flow rate (Q_{max}) in men with urinary tract symptoms. Int Braz J Urol 2016;42:321-6.

18. Stothers L, Macnab A, Bajunirwe F, Mutabazi S, Lobatt C. Comprehension and construct validity of the Visual Prostate Symptom Score (VPSS) by men with obstructive lower urinary tract symptoms in rural Africa. Can Urol Assoc J 2017;11:E405-E408.

19. Putra IB, Hamid AR, Rasyid N, Mochtar CA, Umbas R. Comparison of Visual Prostate Symptom Score with the International Prostate Symptom Score and uroflowmetry parameters in assessing men with lower urinary tract symptoms in Dr. Cipto Mangunkusumo National General Hospital, Indonesia. Prostate Int 2019;7:91-5.

20. Taneja Y, Ram P, Kumar S, Raj K, Singh CK, Dhaked SK, *et al*. Comparison of Visual Prostate Symptom Score and International Prostate Symptom Score in the evaluation of men with benign prostatic hyperplasia: A prospective study from an Indian population. Prostate Int 2017;5:158-61.

21. Roy A, Singh A, Sidhu DS, Jindal RP, Malhotra M, Kaur H. New Visual Prostate Symptom Score versus International Prostate Symptom Score in men with lower urinary tract symptoms: A prospective comparison in Indian rural population. Niger J Surg 2016;22:111-7.
[PUBMED] [Full text]

22. Bhomi KK, Subedi N, Panta PP. Correlation of Visual Prostate Symptom Score with International Prostate Symptom Score and uroflowmetry parameters in Nepalese male patients with lower urinary tract symptoms. JNMA J Nepal Med Assoc 2017;56:217-20.

23. Rodrigues Netto *N* Jr., de Lima ML, de Andrade EF, Apuzzo F, da Silva MB, Davidzon IM, *et al*. Latin American study on patient acceptance of the International Prostate Symptom Score (IPSS) in the evaluation of symptomatic benign prostatic hyperplasia. Urology 1997;49:46-9.

24. Luján Galán M, Páez Borda A, Martín Osés E, Llanes González L, Berenguer Sánchez A. The validity of the IPSS questionnaire in a sample of 262 patients with benign prostatic hyperplasia. Arch Esp Urol 1997;50:847-53.

25. Cam K, Senel F, Akman Y, Erol A. The efficacy of an abbreviated model of the International Prostate Symptom Score in evaluating benign prostatic hyperplasia. BJU Int 2003;91:186-9.

26. Selekman RE, Harris CR, Filippou P, Chi T, Alwaal A, Blaschko SD, *et al*. Validation of a Visual Prostate Symptom Score in men with lower urinary tract symptoms in a health safety net hospital. Urology 2015;86:354-8.

27. Jindal T, Sinha RK, Mukherjee S, Mandal SN, Karmakar D. Misinterpretation of the International Prostate Symptom Score questionnaire by Indian patients. Indian J Urol 2014;30:252-5.
[PUBMED] [Full text]

Figures

[Figure 1], [Figure 2]

Tables

[Table 1], [Table 2], [Table 3], [Table 4]

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