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# Visual Prostate Symptom Score versus International Prostate Symptom Score with Lower Urinary Tract Symptoms

Khalid Hussain, Maria Tariq, Muhammad Asif, Obaid Adil, Jawad Ahmed, Talal Habib

**ABSTRACT**

**Objective:** Benign prostatic enlargement is a common issue in ageing men, causing significant lower urinary tract symptoms (LUTS). This study compares the effectiveness of the International Prostate Symptom Score (IPSS) and the Visual Prostate Symptom Score (VPSS) in assessing LUTS severity among BPH patients in Pakistan, focusing on ease of use, symptom grading, and correlation with uroflowmetry results.

**Study design and setting:** Prospective observational study conducted at the OPD of Urology, Gujranwala Teaching Hospital and Gujranwala Medical College Teaching Hospital, from April 24 to September 24.

**Methodology:** A total of 220 patients over 40 years with LUTS completed IPSS and VPSS assessments, with time taken recorded. Uroflowmetry (Qmax), post-void residual volume (PVRV), and bladder wall thickness were measured before and after one month of á-blocker therapy. Data were analysed using paired t-test, Pearson's correlation, and chi-square test to evaluate association.

**Results:** VPSS took 3-4 minutes for those with primary education, compared to 8-10 minutes for IPSS. Symptom severity grading between IPSS and VPSS showed positive correlation ($r = 0.582$, $P < 0.001$). VPSS scores showed significant correlation with post-treatment improvements in Q max, bladder wall thickness and improvement in PMRV after treatment, confirming its reliability in symptom assessment and treatment monitoring.

**Conclusion:** VPSS is a reliable, quicker alternative to IPSS, especially for populations with lower literacy. It correlates well with symptom severity and treatment outcomes, making it suitable for broader clinical use in diverse settings.

**Key words:** Benign prostatic enlargement, Internal prostate scoring system, Visual prostate scoring symptom.

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## INTRODUCTION:

Lower urinary tract symptoms (LUTS) are a common complaint in adult men with a major impact on quality of life (QoL) and have a substantial economic burden.[1] Benign Prostatic enlargement (BPE) is one of the causes of lower urinary tract symptoms and the leading healthcare problem in men over 50 years of age.[2] The prevalence of BPE increases with age due to hormonal changes, i.e conversion of testosterone into dihydrotestosterone, which stimulates prostate cell proliferation.[3] BPH is the histological diagnosis. BPE is the proliferation of smooth muscles and epithelial cells within the prostatic tissue.[4] A study estimated that 90% of men between 45 and 80 years of age will have lower urinary tract symptoms due to BPH.[2] Scoring of the LUTS is necessary to set the treatment options and to assess their effectiveness. So, for these various symptom scoring systems have been established in the world, including IPSS, the International Consultation on Incontinence Questionnaire for Male LUTS (ICIQ-MLUTS), Danish Prostate Symptom Score and VPSS.[5]

Most patients with BPE present with symptoms of difficulty in voiding. These complex symptoms are nonspecific and

are identified by a variety of terms collectively called lower urinary tract symptoms (LUTS).[6] Although LUTS secondary to BPE (LUTS/BPE) are often not life-threatening conditions, they significantly affect the quality of life (QoL).[7] The International Prostate Symptom Score (IPSS) is used to assess lower urinary tract symptoms (LUTS), which are most often due to benign prostatic enlargement (BPE), prostatic cancer or urethral stricture.[8-9] The first version of the International Prostate Symptom Score (IPSS) was developed in 1992 by the American Urological Association (AUA) and consisted of seven questions. Initially, it did not include the eighth question related to quality of life, so it was originally known as the AUA symptom Score (AUA) or AUA-7.

This scoring system was designed for the self-assessment of a patient about his urinary habits and urinary symptoms over the last 1 month. Moreover, it can be calculated multiple times to check the severity of symptoms and improvements without any bias of treating urologist or physician over the time period and can be compared over time.[10] The IPSS is an attempt to translate symptoms into numbers, which can be divided into different categories according to the symptom's severity into mild, moderate and severe symptoms. However, because of inter-individual differences in perceptions due to educational differences and interpretation of subjective symptoms, it is problematic to compare patients with one another in terms of symptom scores.

The real value of the IPSS is in longitudinal follow-up, where changes in the individual's symptom score can be used to assess response to treatment.[2] Patients with lower educational levels experience greater difficulty completing the IPSS by themselves.[7] Because of the complexity of questions of IPSS, it is very difficult to understand for especially for patients with lower educational levels and even for men with a relatively high level of education, patients often ask the doctors, nurses or paramedical staff for an explanation of the questions while completing the form. This invariably introduces the risk of influencing the patient's responses.[9] This subjective dependency for the elaboration of symptoms in men with LUTS demanded a need for developing a system care that can be used and reproduced to evaluate symptoms and hence can help to guide management strategies.[10] Shah et al. reported that 24-87% of 96 men with LUTS (depending on their level of education) required assistance to complete the IPSS questionnaire.[4] They thereby agreed that the IPSS is difficult to understand even for men with a high level of education. Adam E. Groeneveld, a urologist who has worked for many years in African countries, developed a simplified assessment of the force of the urinary stream. Using this concept, we developed a Visual Prostate Symptom Score (VPSS), which also assesses urinary frequency during the day and night, and the patient's overall quality of life.[7] VPSS differs from the IPSS by presenting the AUA questionnaire in a visual format, allowing older men, and in many cases those with low literacy levels, to assess their urinary problems more easily and reliably. Furthermore, the incorporation of a new concept of quality of life (QoL) into the VPSS facilitates a better understanding of symptoms and their impact on the patient's daily life. This study aimed to compare the effectiveness of IPSS and VPSS in assessing LUTS severity among BPE patients presenting in the outpatient department of Gujranwala Medical College teaching hospital, Gujranwala, focusing on ease of use, symptom grading, and correlation with objective uroflowmetry results and improvement in the Bladder wall thickness.

**METHODOLOGY:**

A prospective observational study was conducted involving 220 male patients aged 45 years and above, presenting with lower urinary tract symptoms (LUTS). The study was approved by the Institutional Review Board of Gujranwala Medical College, Gujranwala (Ref No: IRB.83/GMC), and carried out at the Outpatient Department of Urology, Gujranwala Teaching Hospital and Gujranwala Medical College Teaching Hospital, from April 2024 to September 2024.

The sample size of 220 was calculated for this prospective observation study using OpenEpi software, based on a previously reported prevalence of benign prostatic hyperplasia (BPH) in Pakistan at 17%, with a 95% confidence level [11]

All patients meeting the inclusion criteria were fully informed about the nature of the study, and written informed consent was obtained before enrollment. Inclusion criteria consisted of male patients aged over 45 years presenting with LUTS attributable to benign prostatic enlargement (BPE). A non-probability consecutive sampling technique was used to recruit patients. Exclusion criteria included patients with post-void residual volume (PVRV) less than 50 ml or greater than 500 ml, deranged renal function tests, suspected prostatitis, urethral stricture, prostate cancer, positive urine culture (to rule out chronic cystitis), and neurogenic bladder.

Following consent, a detailed medical history was obtained, and a thorough physical examination was performed. Digital rectal examination (DRE), as well as bulbocavernosus and cremasteric reflexes, were assessed to exclude neurogenic components. A structured proforma was used to record each patient's educational status, and participants were categorised into three groups based on literacy level. Ultrasonography was performed by a qualified radiologist in all cases to assess prostate size, bladder wall thickness, and post-void residual volume, and both investigations were repeated after one month of á-blocker to evaluate treatment response.

Data analysis was performed using SPSS software 26.0. Continuous variables such as prostate size, time taken to complete IPSS and VPSS, symptom scores, and uroflowmetry values (Qmax) were presented as mean ± standard deviation (SD). Categorical variables, including educational level, mode of questionnaire completion (self vs. assisted), and

severity grading, were reported as frequencies and percentages. To compare mean differences between multiple educational groups in terms of IPSS and VPSS completion time, one-way analysis of variance (ANOVA) was applied, followed by post-hoc Tukey's HSD test for pairwise comparisons. Paired sample t-tests were used to evaluate the change in Qmax before and after one month of treatment, as well as changes in symptom severity and post-void residual volumes.

Pearson's correlation coefficient (r) was used to assess the strength and direction of association between IPSS and VPSS domains (frequency, nocturia, weak stream), overall symptom scores, and quality of life scores. Additionally, the relationship between VPSS stream scores and Qmax was analysed using Pearson's correlation coefficient. Correlation values were interpreted based on standard criteria: values between 1-7 were considered mild, 8–19 moderate, and 10-35 were severe[12]. A chi-square test was employed to compare categorical variables, such as the mode of assessment across age groups and severity grading distribution between IPSS and VPSS. A p-value of <0.05 was considered statistically significant.

**RESULTS:**

Figure 1 illustrates the educational attainment of the 220 study participants. The largest subgroup (n = 102; 46.4%) had only primary schooling, followed by those who completed matriculation (n = 85; 38.6%), while the smallest group were university graduates (n = 33; 15.0%). As shown in Figure 1, nearly half of the cohort had only a basic education, which may influence their ability to self-complete symptom scores and underscores the importance of choosing patient-reported outcome measures that accommodate varying literacy levels.

As summarised in Table 1, the average time required to complete the IPSS questionnaire decreased markedly with higher educational attainment, from 10.10 ± 1.8 minutes among participants without formal schooling to 3.21 ± 0.8 minutes in graduates. A similar but even more pronounced trend was observed for the VPSS, with completion times falling from 4.05 ± 0.9 minutes in the primary-educated group to 1.20 ± 0.5 minutes among graduates. As shown in Table 2, mean prostate size increased with age, rising from 54.2 g in the 41–50 year group to a peak of 69.2 g in those aged 61–70, with an overall mean of 62.7 g. Completion modality differed markedly between the two instruments: only 19 of 220 men (8.6%) were able to self-complete the text-based IPSS, and self-completion rates dropped to zero in the = 81 cohort. By contrast, the pictogram-based VPSS yielded 90% self-completion (198/220) across all ages, with assistance required for just 22 patients—most commonly in the oldest group (8/30). This demonstrates the VPSS's superior usability, especially among older patients with larger prostates. Table 3 compares the classification of symptom severity between the IPSS and VPSS instruments. Both scales divide patients into mild, moderate, and severe categories—IPSS using ranges of 1–7 mild, 8–19 moderate, and 20–35 severe, and VPSS using 1–3 mild, 4–9 moderate, and 10–17 severe categories according to the criteria defined in the methodology, respectively. The overall Pearson correlation coefficient of r = +0.582 ($p < 0.001$) demonstrates a statistically significant, moderate positive relationship between the two grading systems, confirming that VPSS severity categories align reliably with those of the established IPSS. As shown in Table 4, uroflowmetry revealed a marked shift toward higher Qmax values after one month of á-blocker therapy. Before treatment, only 13 patients (6%) achieved a flow rate above 16 ml/sec; this number rose to 123 (56%) post-treatment. Those in the lowest category (1– 5 ml/sec) decreased from five to four patients, and the 6–10 ml/sec group fell dramatically from 85 to 22. Meanwhile, the 11–15 ml/sec cohort declined from 117 to 71. These results underscore a clinically significant improvement in urinary flow following VPSS-guided management.

Table 5 summarises the strength and significance of correlations between corresponding IPSS and VPSS symptom domains, and the relationship between the VPSS stream score and objective urinary flow (Qmax). Symptom frequency demonstrated a very strong positive correlation ($r = 0.845$, $p < 0.001$), as did overall quality-of-life scores ($r = 0.864$, $p < 0.001$). Nocturia showed a moderate correlation ($r = 0.425$, $p < 0.001$), whereas the weak-stream domain correlated more weakly and did not reach statistical significance ($r = 0.246$, $p = 0.069$). Notably, the VPSS stream score was inversely correlated with Qmax ($r = -0.365$, $p < 0.001$), confirming that higher bother from weak stream pictograms aligns with lower measured flow rates.

Figure 1: Distribution of Educational Levels among Study Participants (n=220)

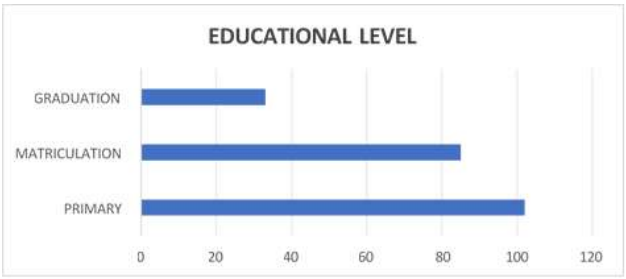


Table 1: Comparison of Average Completion Time for IPSS and VPSS across Different Educational Levels

| Education Level | IPSS Completion (mean ± SD) | VPSS Completion (time mean ± SD) |
|---|---|---|
| Primary (no formal) | 10.10 ± 1.8 min | 4.05 ± 0.9 min |
| Matriculation | 6.40 ± 1.2 min | 2.28 ± 0.7 min |
| Graduate | 3.21 ± 0.8 min | 1.20 ± 0.5 min |

**P-value** = 0.001

Table 2: Distribution of IPSS and VPSS Assessment Modes Across Age Groups and Mean Prostate Size

| Age Group (years) | n | Mean Prostate Size (g) | IPSS Self-Completion | IPSS Assisted | VPSS Self-Completion | VPSS Assisted |
|---|---|---|---|---|---|---|
| 41–50 | 25 | 54.2 | 10 | 15 | 22 | 3 |
| 51–60 | 57 | 58.7 | 7 | 50 | 54 | 3 |
| 61–70 | 62 | 69.2 | 2 | 60 | 60 | 2 |
| 71–80 | 46 | 60.3 | 2 | 44 | 40 | 6 |
| = 81 | 30 | 64.2 | 0 | 30 | 22 | 8 |
| **Total** | 220 | 62.7 | 19 | 201 | 198 | 22 |

Table 3: Comparison of Severity Grading Between IPSS and VPSS Scores

| Severity | IPSS Range | VPSS Range | Correlation (r) | p-Value |
|---|---|---|---|---|
| Mild | 1–7 | 1–3 | +0.582 | < 0.001 |
| Moderate | 8–19 | 4–9 | | |
| Severe | 20–35 | 10–17 | | |

Table 4: Comparison of Qmax (ml/sec) Before and After á-Blocker Therapy (Uroflowmetry Results). Treatment as Assessed by VPSS

| Qmax Category | Before Treatment (n) | After 1 Month (n) |
|---|---|---|
| 1–5 ml/sec | 5 | 4 |
| 6–10 ml/sec | 85 | 22 |
| 11–15 ml/sec | 117 | 71 |
| > 16 ml/sec | 13 | 123 |

Table 5: Correlation Between IPSS and VPSS Domains and Uroflowmetry Outcomes

| Comparison | r-value | p-value |
|---|---|---|
| Frequency (IPSS vs. VPSS) | 0.845 | < 0.001 |
| Nocturia (IPSS vs. VPSS) | 0.425 | < 0.001 |
| Weak Stream (IPSS vs. VPSS) | 0.246 | 0.069 |
| Quality-of-Life (IPSS vs. VPSS) | 0.864 | < 0.001 |
| Stream Score VPSS vs. Qmax | -0.365 | < 0.001 |

## DISCUSSION:

Benign prostatic hyperplasia (BPH) is a prevalent condition among ageing men, with significant effects on their health, quality of life, and healthcare systems globally.[13] This study highlights the importance of reliable tools for symptom assessment in patients with benign prostatic hyperplasia (BPH), while also exposing the challenges of applying them to diverse populations. The International Prostate Symptom Score (IPSS) has been a fundamental tool for the diagnosis and management of BPH-related symptoms for years; however, it is not without limitations. In response to these limitations, the Visual Prostate Symptom Score (VPSS) emerged as a more recent alternative that seeks to facilitate symptom assessment, especially among patients with low educational levels or difficulty understanding lengthy questionnaires.

IPSS, composed of seven questions, is widely recognised for allowing healthcare professionals to quantify the severity of lower urinary tract symptoms (LUTS). However, recent research has indicated that its effectiveness may be compromised in patients with low educational levels. Several studies have shown that many men with LUTS require assistance to complete the questionnaire, which can bias the results, as responses may be influenced by the person assisting them.[14-15] Another weakness of the IPSS lies in the subjectivity of its questions, as it is based on the individual patient's perception of their symptoms. This variability makes comparisons between different cases difficult and limits their usefulness in population studies. Furthermore, the IPSS focuses primarily on symptom severity, neglecting the psychosocial impact these symptoms can have on the patient's quality of life, something especially relevant in contexts where literacy is limited, as is the case in several regions of developing countries, including Pakistan [16]

VPSS was designed precisely to overcome these limitations. Through a visual format, it replaces the textual content of the IPSS with illustrations that allow patients to self-assess, even if they cannot read or write. This makes it a particularly useful tool in contexts with educational barriers, and in countries like Pakistan, it has shown notable potential for improving patient engagement and diagnostic accuracy.[17] One of the main strengths of the VPSS is that it includes a quality-of-life assessment in a more accessible format, allowing for the real impact that urinary symptoms have on the patient's daily life and emotional well-being. This comprehensive view aligns with current healthcare trends, which promote person-centred care.[18] Studies have shown that the VPSS correlates well with the IPSS in classifying symptom severity, supporting its validity as an alternative diagnostic tool.[19] Moreover, research has highlighted that patients complete the VPSS in less time than the IPSS, with this difference being more evident in people with basic or no formal education. This efficiency is especially valuable in clinical settings with high patient loads or with elderly patients who may become fatigued easily during prolonged Evaluations.[20-21] The findings of this research have important implications for the management of BPH. Considering the progressive ageing of the global population and the high prevalence of this condition, practical, understandable, and effective tools for its diagnosis and follow-up are essential. Instruments such as the VPSS can improve care in resource-limited settings by allowing for more equitable and inclusive assessment.[22-23]

The ability to accurately assess symptom severity allows for personalised treatment and more appropriate monitoring of clinical progress. Both the IPSS and VPSS allow for monitoring changes over time, which is key to tailoring therapeutic interventions. Furthermore,

some recent studies recommend complementing these tools with objective methods, such as uroflowmetry, to improve the diagnostic accuracy and clinical management of BPH.

In this context, future research must continue to refine instruments such as the VPSS to better adapt them to diverse populations. Further exploration is also needed into the psychosocial effects of BPH and how symptom assessment tools can more fully capture its impact on patients' lives.

## CONCLUSION:

This prospective observational study demonstrated that the VPSS is a reliable and accessible alternative to the IPSS for evaluating LUST in men with BPH. Completion times for VPSS were significantly shorter across all educational levels compared to IPSS (ANOVA, $p < 0.001$), and VPSS severity grading showed a significant correlation with IPSS categories (chi-square, $p < 0.001$). Furthermore, VPSS scores correlated moderately with objective measures, including Qmax and PVRV (Pearson's $r = 0.582$, $p < 0.001$). These findings confirm that VPSS can be effectively used in populations with low literacy, where IPSS may be impractical. Health systems in regions such as Pakistan should consider adopting VPSS alongside IPSS to ensure inclusive and efficient assessment, while also strengthening patient education to improve accessibility of care.

## LIMITATIONS

Limitations in this study were a single-centre design. This study was conducted at two teaching hospitals in a single city, which may limit the generalizability of the results to other regions and populations with different cultures and healthcare settings. Secondly, there was a short follow-up duration. Outcomes were assessed only after one month of alpha-blocker therapy, which may fully capture long-term symptom changes or treatment impacts. Thirdly, exclusion of comorbid conditions. Patients with prostate cancer, prostatitis, and neurogenic bladder were excluded, so the results may not apply to all men presenting with LUTS in real-world clinical practice.

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**Authors Contribution:**
**Khalid Hussain:** Conception and final design
**Maria Tariq:** Study design final
**Muhammad Asif:** Revise critically
**Obaid Adil**: Analysis
**Jawad Ahmed:** Drafting of study
**Talal Habib:** Acquisition of data

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