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# CORRELATION BETWEEN VISUAL PROSTATE SYMPTOM SCORE (VPSS) AND QMAX

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**ABSTRACT**

**Introduction:** The American Urological Association -7 (AUA-7) symptom index, later recognized by World Health Organization as International Prostate Symptom Score (IPSS) is a validated tool with excellent test-retest reliability. IPSS was supposed to be self-administered with its use in primary care settings but patients with lower education level find it difficult to understand. There are chances of misinterpretation and misreporting if done by other family members. To overcome these problems Visual prostate symptom score (VPSS) has been devised by van Der Walt et al from Stellenbosch University, South Africa. It is a pictogram having four components representing weak stream, day and night frequency and quality of life. This is easy to use and comprehend even by patients with lower education level. **Objectives:** To determine the correlation between Visual prostate symptom score (VPSS) and Qmax in patients with lower urinary tract symptoms. **Materials & Methods:** A total of 100 patients presented with lower urinary tract symptoms aged 50-80 years were included. Patients with chronic urinary retention having deranged renal function tests, previous prostate surgery, distal ureteric stone and neurogenic bladder were excluded. VPSS was assessed by the researcher himself. After this each patient was undergone urodynamic studies and urine flow rate (Qmax) was measured. **Results:** Mean VPSS was $11.57 \pm 2.97$ and mean Qmax was $9.71 \pm 2.81$ ml/s. Pearson's correlation between Visual prostate symptom score (VPSS) and Qmax in patients with lower urinary tract symptoms was found to be 0.649 with p-value of 0.0001 which is significant and showed strong correlation between Visual prostate symptom score (VPSS) and Qmax. **Conclusion:** This study concluded that VPSS is significantly correlated with Qmax in patients with lower urinary tract symptoms.

**KEYWORDS:** lower urinary tract symptoms, visual prostate symptom score, uroflowmetry.

## INTRODUCTION

Benign prostate hyperplasia is one of the most common conditions among aging men, making BPH a leading source of healthcare problem of old age in the world.[1] BPH is actually a histological diagnosis due to the proliferation of smooth muscles and epithelial cells within the prostatic tissue.[2] The prevalence increases with age. In a study by McVary, it was estimated that 90% of men between 45 and 80 years of age will have some types of symptoms due to BPH.[3] Understanding the disease pathophysiology and its progression; symptom complex and its effects on the population is essential. Similarly, grading of the symptoms of BPH is also very necessary to establish a proper guideline for treatment and also to assess the efficacy of treatment at its various stages. In view of all these concerns various symptom scores and symptom index have been developed so far in various parts of the world for grading BPH symptoms among the affected individuals.[4]

Patients with benign prostatic enlargement seek medical treatment for bothersome lower urinary tract symptoms

and the relief of symptoms is the most frequent indication for intervention.1 Several differential instruments have been developed to quantitate the severity of BPH symptoms, such as the Boyarsky score, Madsen Iversen score, American Urological Association (AUA) symptom index, and Danish prostatic symptom score.[1,2]

The AUA symptom index was developed specifically as an outcome measure in the study of different BPH therapies. The first World Health Organization consultation on benign prostatic hyperplasia adopted the AUA symptom index with the addition of one quality-of-life question, and called it the International Prostate Symptom Score (IPSS).[3]

The American Urological Association -7 (AUA-7) symptom index, later recognized by World Health Organization as International Prostate Symptom Score (IPSS) is a validated tool with excellent test-retest reliability.[5] IPSS was supposed to be self administered with its use in primary care settings but patients with lower education level find it difficult to understand. There are chances of misinterpretation and misreporting if done by other family members.[6] Furthermore, aged patients with LUTS may have visual and cognitive impairment adding to the difficulty.[7] To overcome these problems Visual prostate symptom score (VPSS) has been devised by van Der Walt et al from Stellenbosch University, South Africa. It is a pictogram having four components representing weak stream, day and night frequency and quality of life. This is easy to use and comprehend even by patients with lower education level.[8,9] It is simple, easily completed without assistance and less time taking. In a study, there is a negative correlation between VPSS and Qmax (r=0.719, p<0.0001).[10] Another study has shown negative correlation between VPSS and Qmax (r=0.578).[11]

Limited data is available on applicability of VPSS in a setting like ours where major proportion of the patients belongs to low socioeconomic status with low education level. The rationale of this study is to determine the correlation between VPSS and Qmax. In this way, this easy and reliable tool can be applied routinely in our setups to assess symptom severity in cases of BEP presenting with LUTS. It has the added advantage of utility in assessment of LUTS in patients with lower educational status.

**MATERIALS AND METHODS**
After taking permission from ethical review committee, this descriptive, case series study was done from July 2021 to June 2022. Total 100 male population of age 50–80 years patients presented with lower urinary tract symptoms to Urology Department of Shahida Islam Teaching Hospital in Lodhran and Bahawal Victoria Hospital, Bahawalpur were selected. The sample size was calculated with following calculations, α-error = 5%,

β-error = 10% and r = 0.578.[11] Patients having Voided volume <150 ml on uroflowmetry, chronic urinary retention having derranged renal function tests (s/creatinine >1.5 mg/dl), refractory retention of urine (assessed clinically), previous history of TURP, distal ureteric stone (assessed on USG) and neurogenic bladder were excluded.

Informed consent was taken from each patient. VPSS (attached as annexure I) was assessed by the researcher himself. The VPSS consists of 4 pictograms to evaluate the following domains: Q1, force of urinary stream; Q2, frequency; Q3, nocturia, and Q4, QoL of patients. The degree of severity of these symptoms was noted from 0 to 6. Maximum score on VPSS was 23. After this each patient was undergone urodynamic studies and urine flow rate (Qmax) was measured. This all data (age, duration of symptoms, VPSS and urine flow rate (Qmax)) was recorded on a specially designed proforma (Annexure-I).

Data was analyzed using statistical program for social sciences (SPSS) version 25.0. Age, duration of symptoms, VPSS and urine flow rate (Qmax) were presented as mean and standard deviation. Pearson's correlation was calculated between Visual prostate symptom score (VPSS) and Qmax. P-value ≤0.05 was taken as significant.

**RESULTS**
Age range in this study was from 50 to 80 years with mean age of 62.90 ± 6.61 years. Majority of the patients 62 (62.0%) were between 50 to 65 years of age. Mean duration of disease was 6.29 ± 3.02 months with. Distribution of patients according to education is shown in Figure I.

Mean VPSS was 11.57 ± 2.97 and mean Qmax was 9.71 ± 2.81 ml/s as shown in Table I. Pearson's correlation between Visual prostate symptom score (VPSS) and Qmax in patients with lower urinary tract symptoms was found to be 0.649 with p-value of 0.0001 which is significant and showed strong correlation between Visual prostate symptom score (VPSS) and Qmax.
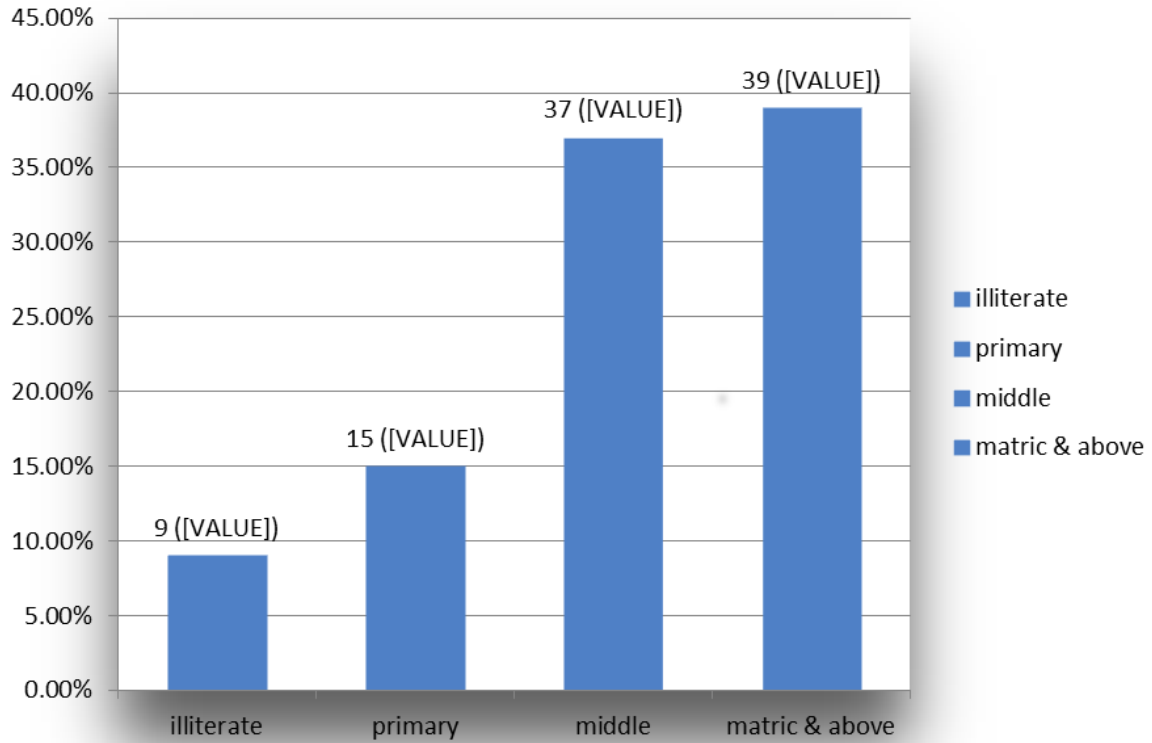
**Figure I: Distribution of patients according to education.**

**Table I: Correlation between Visual prostate symptom score (VPSS) and Qmax in patients with lower urinary tract symptoms.**

|  | Mean | Std. Deviation | n |
|---|---|---|---|
| VPSS | 11.57 | 2.97 | 100 |
| Qmax (ml/s) | 9.71 | 2.81 | 100 |

- **Pearson's correlation is 0.649 with p-value of 0.0001 which is significant and showed strong correlation between Visual prostate symptom score (VPSS) and Qmax.**

**Annexure I: Visual prostate symptom score (VPSS)**
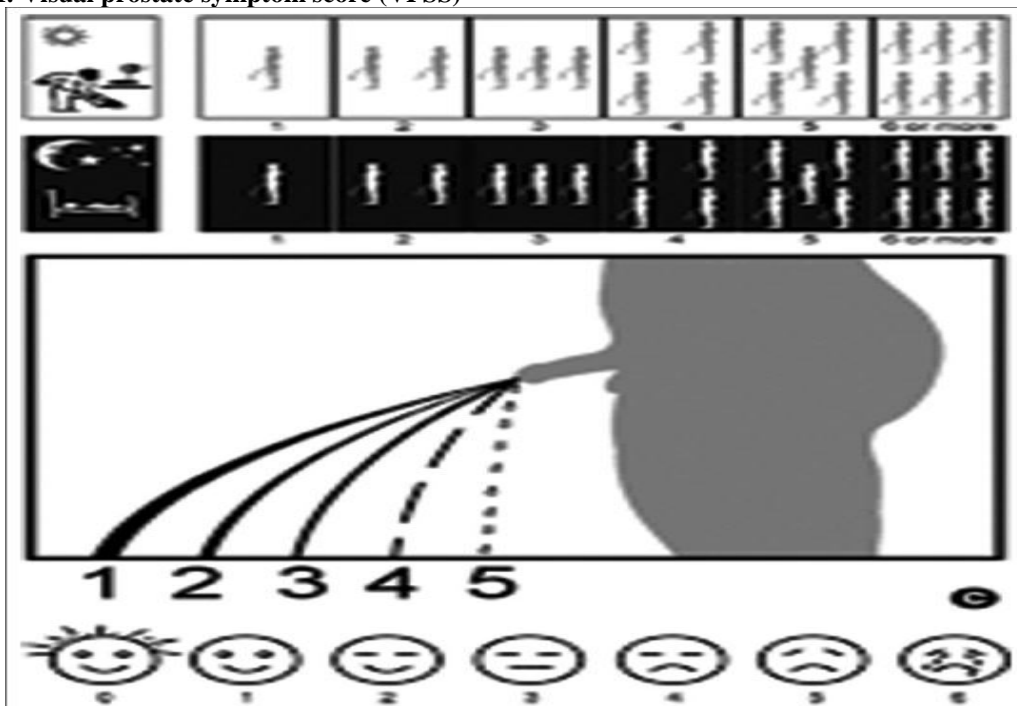
## DISCUSSION

In multiple public health studies it has been identified that LUTS have significant implication on quality of life and in severe state they may lead to psychological sequel that may result in depression and anxiety.[12,13] Objective evaluation of LUTS is not only necessary to follow on progression but also to assess the efficacy of treatment.[14] Of the many questionnaires to evaluate male LUTS, IPSS is the most preferred one.[15,16]

One of the most significant causes of male LUTS is obstruction; uroflowmetry (UFM) is a simple and non-invasive tool to assess obstruction. UFM determines volume of urine passed per unit of time. It has numeric and graphic representation, which evaluates multiple parameters out of which Voided Volume (VV) and Maximum Flow Rate (Qmax), the most important. It has been observed that 30-70% of men cannot complete the IPSS because the questions are difficult to understand as they are wordy and people with lower level of education cannot complete it.[17-19] In order to obviate these difficulties, Visual Prostrate Symptoms Score (VPSS) has been introduced. VPSS is a pictorial assessment version of IPSS.[14]

I have conducted this study to determine the correlation between Visual prostate symptom score (VPSS) and Qmax in patients with lower urinary tract symptoms. In my study, mean VPSS was $11.57 \pm 2.97$ and mean Qmax was $9.71 \pm 2.81$ ml/s. Pearson's correlation between Visual prostate symptom score (VPSS) and Qmax in patients with lower urinary tract symptoms was found to be 0.649 with p-value of 0.0001 which is significant and showed strong correlation between Visual prostate symptom score (VPSS) and Qmax. In a study, there is a negative correlation between VPSS and Qmax (r=0.719, p<0.0001).[10] Another study has shown negative correlation between VPSS and Qmax (r=0.578).[11]

In a study by Memon MA et al[8], the mean VPSS score was $11.4 \pm 2.72$ (11.0). In the univariate linear regression analysis there was strong negative (Pearson's) correlation between VPSS and Qmax (r=848, p<0.001). In the multiple linear regression analyses there was a significant correlation between VPSS and Qmax. Wessels et al had used the VPSS in assessing LUTS in patients with urethral stricture disease. The study found that the VPSS correlated significantly with the IPSS, Qmax, and urethral diameter. Also, the questionnaire takes significantly less time to complete than the IPSS.[20] Park et al found the VPSS may be used in evaluating LUTS at initial and follow-up visits.[21] Future possible application of the VPSS is in evaluating LUTS in men who underwent brachytherapy. A study by Okihara et al which assessed LUTS in patients who underwent brachytherapy found that the visual analog scale reflected symptoms and QoL of patients more precisely than the IPSS.[22]

A study in a rural area in Nusa Tenggara Timur, Indonesia, showed most participants who were illiterate or with low level of education were able to complete the VPSS without assistance. Also, this study showed that language was not a barrier for completing the questionnaire.[23] The VPSS was made to facilitate illiterate or poorly educated men who found it impossible to complete the IPSS by illustrating the questions into simple diagrams.[24] Selekman et al found that the questionnaire was more useful than the IPSS in evaluating patients with LUTS, especially in patients with limited education and literacy.[25] Similarly, a recent study in India by Taneja et al showed that the VPSS could be completed by most people with low level of education.[11] An earlier study in Namibia showed that apart from illiteracy, language was not a barrier in completing the VPSS questionnaire.[26]

A study by Ceylan et al which compared both the questionnaires in Turkish people found that the VPSS was more reliable than the IPSS in low-educated patients and in elderly patients who have difficulty in reading small prints in the IPSS.[27] The VPSS includes schematic diagrams and can be understood easily even by illiterate elderly man. It reduces the risk of misinterpretation in translating the patient's symptoms into meaningful scoring system. Hence in developing country like Pakistan where literacy levels in the elderly are low, replacing IPSS with VPSS to assess the severity of LUTS may greatly help to make appropriate decision for management of these patients.

## CONCLUSION

This study concluded that the VPSS is significantly correlated with Qmax in patients with lower urinary tract symptoms. So we recommend that this novel questionnaire should be used as an alternative tool for the IPSS for assessing men with LUTS, especially for those with lower level of education.

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