

Original Research Article

Value of the visual prostate symptom score in evaluation of symptomatic benign prostatic enlargement: prospective study in a Nigerian population

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ABSTRACT

Background: To evaluate the correlation of Visual Prostate Symptom Score (VPSS) with International Prostate Symptom Score (IPSS) and Maximum Urinary Flow (Qmax). To investigate the effect of educational level on the ability to independently complete the VPSS versus the IPSS and time taken to do so.

Methods: Bio data was taken from men with lower urinary tract symptoms (LUTS) due to Benign Prostatic Enlargement (BPE) who presented at the Urology clinic of Jos University Teaching Hospital. They were administered the IPSS questionnaire and VPSS pictogram, which they completed with or without physician assistance and the time taken to do so was noted. They subsequently had uroflowmetry done on same visit and the data was recorded in a structured proforma. Statistical analysis was done using SPSS^(R) version 20. Correlation test was done for VPSS, IPSS and Qmax while the paired *t*-test was used for the average time spent in completing both questionnaires. A *p*-value <0.05 was considered as significant.

Results: Eighty-five men (aged 42 to 94 years) were enrolled in the study. The VPSS correlated significantly with the IPSS in terms of total score ($r = +0.684$, $p < 0.001$) and QoL ($r = +0.570$, $p < 0.001$), as well as with the Qmax ($r = -0.222$, $p = 0.041$). A greater proportion (21.2%) of men with limited education could complete the VPSS without physician assistance as compared to the IPSS (6.0%) and the average time taken to complete the VPSS (170.51 seconds) was significantly shorter than the time taken to complete the IPSS (406.42 seconds).

Conclusions: The VPSS correlates significantly with the IPSS and Qmax. It can be completed without physician assistance by a greater proportion of men with limited education within a shorter time period.

Keywords: Benign prostatic enlargement, International prostate symptom score, Lower urinary tract symptoms, Uroflowmetry, Visual prostate symptom score

INTRODUCTION

The commonest clinical presentation of Benign Prostatic Enlargement (BPE) is lower urinary tract symptoms (LUTS), which is also the commonest presenting complaint in the urology clinic.^{1,2} The severity of LUTS

in a patient with BPE, significantly influences the treatment pathway the patient is placed on, and it can be assessed using both subjective and objective methods. The subjective assessment involves the use of various symptom scores, based on the patient's own assessment of his symptoms, among which the International Prostate

Symptom Score (IPSS) is the most accepted by urologists worldwide.³ Another subjective symptom assessment parameter is the new Visual Prostate Symptom Score (VPSS) recently developed in South Africa by van der Walt et al.⁴ A more objective assessment can be obtained using urodynamic studies.⁵⁻⁷

While the IPSS is a useful tool for assessing severity of LUTS in men with bladder outlet obstruction (BOO), an important problem with it is that many patients find it difficult to comprehend.^{7,8} Patients with low educational levels misrepresent their scores more often, possibly predisposing them to inappropriate treatment with associated financial implications.^{9,10} Because the IPSS questions are difficult to understand, even for men with a relatively high level of education, patients often ask the doctor, nurse or even relatives for explanation of the questions while completing the form. This further introduces the risk of undue bias on the patient's response and prolongs the consultation time in an already busy urology clinic.¹¹ The VPSS is a new concept aimed at simplifying the subjective assessment of the severity of LUTS in men with BPE and to overcome the challenges associated with administration of the IPSS. The VPSS uses pictograms to assess four IPSS questions related to frequency, nocturia, weak stream and quality of life (QoL). The concept of the VPSS was based on the observation by an author that illiterate or poorly educated men who found it difficult to complete the IPSS, even with physician assistance could easily comprehend a simple diagram showing a urinating man, in which they could indicate the force of their urinary stream.⁴

This study was aimed at assessing the reliability of the VPSS in assessment of severity of LUTS by comparing it with IPSS and objective uroflowmetry parameter (maximum urinary flow (Qmax)).

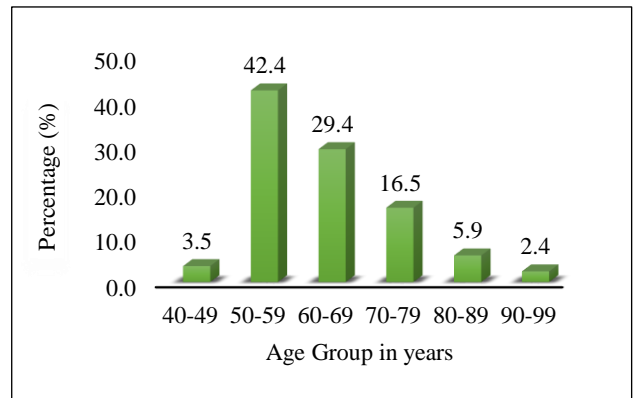
METHODS

This hospital based prospective descriptive study was carried out at the Jos University Teaching Hospital, a tertiary health institution located in Jos, Plateau state, Nigeria, among men who presented to the urology clinic with LUTS attributable to BPE, from November 2014 to November 2015. Permission to conduct this study was obtained from the Institutional Research and Ethics Committee. Informed consent was also obtained from all patients who met the criteria for inclusion in the study. Each subject was administered a copy of the IPSS questionnaire and VPSS pictogram (Appendix 1), which they were required to complete independently or with assistance. Those who were unable to complete the forms independently were assisted by the attending doctor, and the time taken to complete the forms with or without assistance was recorded using a stopwatch. They subsequently had uroflowmetry test on the same visit. Their results were recorded in a structured proforma for analysis.

All data obtained from the study subjects were collated and subjected to statistical analysis using the Statistical Package for Social Sciences (SPSS®) version 20. Bar and pie charts were used for descriptive analysis of demographics. The paired t-test was used for analysis of time spent completing each set of questionnaires and the Pearson's Chi-square test was used for contingency table analysis evaluating factors associated with how patients completed the IPSS and VPSS questionnaires. Spearman's rank correlation test was used for correlation analysis between IPSS, VPSS and Qmax. A two tailed *p*-value of <0.05 was accepted as statistically significant.

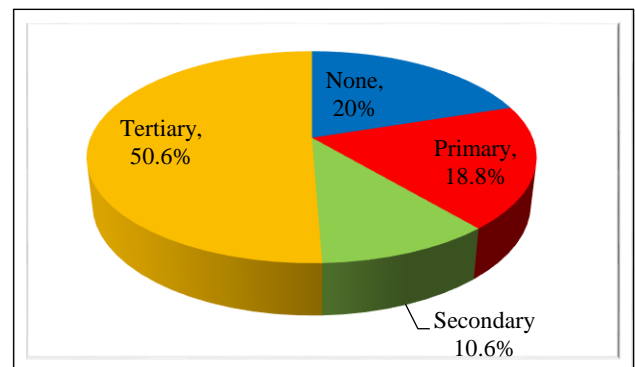
RESULTS

A total of 85 men (mean age 63years, range 42 to 94years) with LUTS due to BPE who met the inclusion criteria and gave consent were recruited for the study. The age distribution and educational characteristics of the study population are as presented in Figures 1 and Figure 2 respectively.



LUTS: Lower Urinary Tract Symptoms, BPE: Benign Prostatic Enlargement

Figure 1: Age distribution of 85 men with LUTS due to BPE.



LUTS: Lower urinary tract symptoms, BPE: Benign prostatic enlargement

Figure 2: Distribution of 85 men with LUTS due to BPE according to level of education.

The average time taken to complete the International Prostate Symptom Score was 406.42 seconds as against

170.51 seconds for the Visual Prostate Symptom Score (p<0.001) (Table 1).

Table 1: Average time taken to complete the IPSS vs. the VPSS.

	Average Time (seconds)	SD (seconds)	Paired t-test	P – Value
IPSS	406.42	190.421	14.207	<0.001
VPSS	170.51	94.366		

IPSS: International Prostate Symptom Score, VPSS: Visual Prostate Symptom Score

Table 2: Ability to complete the IPSS and VPSS with and without assistance.

VPSSASST	IPSSASST			Chi-Square	P-Value
	Yes	No	Total		
Yes	47(55.3%)	3(3.5%)	50(58.8%)	34.6	0.01
No	12(14.1%)	23(27.1%)	35(41.2%)		
Total	59(69.4%)	26(30.6%)	85(100%)		

VPSSASST=VPSS completed with assistance, IPSSASST=IPSS completed with Assistance

The questionnaires were completed without assistance by 26 of 85 men (30.6%) for the IPSS and 35 of 85 men (41.2%) for the VPSS (p = 0.01). Similarly, 59 of 85 men (69.4%) needed assistance to complete the IPSS compared to 50 of 85 men (58.8%) who needed assistance to complete the VPSS (p = 0.01) (Table 2).

Analysis of data on effect of level of education on patients’ ability to complete the questionnaires as presented in Table 3 and Table 4 shows a significant relationship between educational level and ability to

complete the IPSS (p = .001) and VPSS (p = 0.03). In the group with no education, 17 of 17 men (100%) required assistance to complete the IPSS. In this same group, 14 of 17 men (82.4%) needed assistance to complete the VPSS while 3 of 17 men (17.6%) were able to complete the VPSS without assistance. In the group with tertiary education, 23 of 43 men (53.5%) needed assistance to complete the IPSS as against 20 of 43 men (46.5%) for the VPSS while 20 of 43 men (46.5%) were able to complete the IPSS without assistance as against 23 of 43 men (53.5%) for the VPSS.

Table 3: Level of education and ability to complete IPSS.

n = 85 Educational Level	IPSS with Assistance		Total	Chi-Square	p-Value
	Yes	No			
None	17(100.0%)	0(0.0%)	17(100.0%)	15.9	0.001
Primary	14(87.5%)	2(12.5%)	16(100.0%)		
Secondary	5(55.6%)	4(44.4%)	9(100.0%)		
Tertiary	23(53.5%)	20(46.5%)	43(100.0%)		

IPSS: International Prostate Symptom Score.

Table 4: Level of education and ability to complete VPSS.

n = 85 Educational Level	VPSS with Assistance		Total	Chi-Square	P -Value
	Yes	No			
None	14(82.4%)	3(17.6%)	17(100.0%)	9.1	0.03
Primary	12(75.0%)	4(25.0%)	16(100.0%)		
Secondary	4(44.4%)	5(55.6%)	9(100.0%)		
Tertiary	20(46.5%)	23(53.5%)	43(100.0%)		

VPSS: Visual Prostate Symptom Score.

Comparing the groups with less than secondary school level of education versus at least secondary school level

of education revealed that, in the group with less than secondary school level of education, assistance was needed to complete the IPSS by 31 of 33 men (94.0%)

and to complete the VPSS by 26 of 33 men (78.8%). Only two of 33 men (6.0%) were able to complete the IPSS without assistance while seven of 33 men (21.2%) were able to complete the VPSS without assistance ($p = 0.005$) (Table 5). The group with at least secondary level of education, assistance was needed to complete IPSS by

28 of 52 men (53.9%) and to complete the VPSS by 24 of 52 men (46.1%). 24 of 52 men (46.1%) completed the IPSS without assistance while 28 of 52 men (53.9%) completed the VPSS without assistance ($p = 0.01$) (Table 6).

Table 5: Ability to complete the IPSS and VPSS by subjects with less than secondary school education.

VPSSASST	IPSSASST			Chi-Square	P-Value
	Yes	No	Total		
Yes	26(78.8%)	0(0.0%)	26(78.8%)	7.9	0.005
No	5(15.2%)	2(6.0%)	7(21.2%)		
Total	31(94.0%)	2(6.0%)	33(100%)		

VPSSASST=VPSS completed with assistance, IPSSASST=IPSS completed with assistance

Table 6: Ability to complete the IPSS and VPSS by subjects with at least secondary school education.

VPSSASST	IPSSASST			Chi-Square	P-Value
	Yes	No	Total		
Yes	21(40.4%)	3(5.8%)	24(46.2%)	20.3	0.01
No	7(13.5%)	21(40.4%)	28(53.8%)		
Total	28(53.8%)	24(46.2%)	52(100%)		

VPSSASST=VPSS completed with assistance, IPSSASST=IPSS completed with assistance

Table 7: Correlation between various VPSS, IPSS and Uroflowmetry parameters recorded by study group.

Parameters	Correlation coefficient (r)	P value
Total VPSS Score vs. Total IPSS Score	+ 0.684	0.001
VPSS QoL vs. IPSS QoL	+ 0.570	<0.001
IPSS Score vs. IPSS QoL	+ 0.589	<0.001
VPSS Score vs. VPSS QoL	+ 0.898	<0.001
VPSS Score vs. Qmax	- 0.222	0.041
VPSS QoL vs. Qmax	- 0.149	0.174
IPSS Score vs. Qmax	- 0.328	0.002
IPSS QoL vs. Qmax	- 0.113	0.303
Total VPSS (categories) vs. Total IPSS (categories)	+ 0.387	<0.001
VPSS QoL (categories) vs. IPSS QoL (categories)	+ 0.835	<0.001

IPSS: International Prostate Symptom Score, VPSS: Visual Prostate Symptom Score, QoL: Quality of Life, Qmax: maximum urinary flow rate

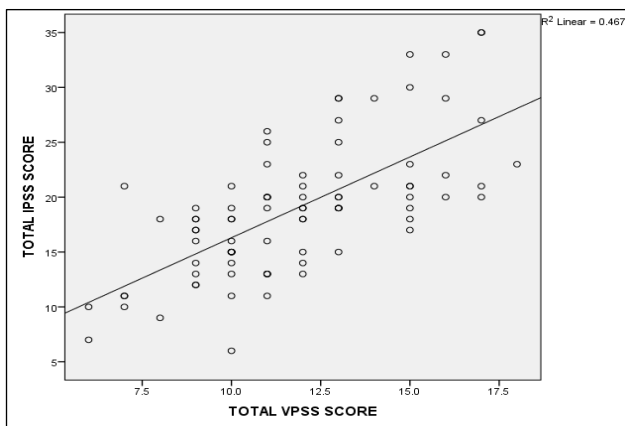


Figure 3: Scatter plot determining correlation between total VPSS score and total IPSS score.

There was statistically significant positive correlation between total VPSS score and total IPSS score, VPSS QoL and IPSS QoL, as well as between total VPSS score and VPSS QoL, total IPSS score and IPSS QoL (Table 7, Figure 3 and Figure 4).

There was statistically significant negative correlation between total VPSS score, total IPSS score and the Q_{max} but the negative correlation between VPSS QoL, IPSS QoL and the Q_{max} were not statistically significant.

When patients' symptom severity and quality of life were categorized into mild, moderate and severe, statistically significant positive correlation were also found between VPSS and IPSS for each category of symptom severity in total score and quality of life (Table 7).

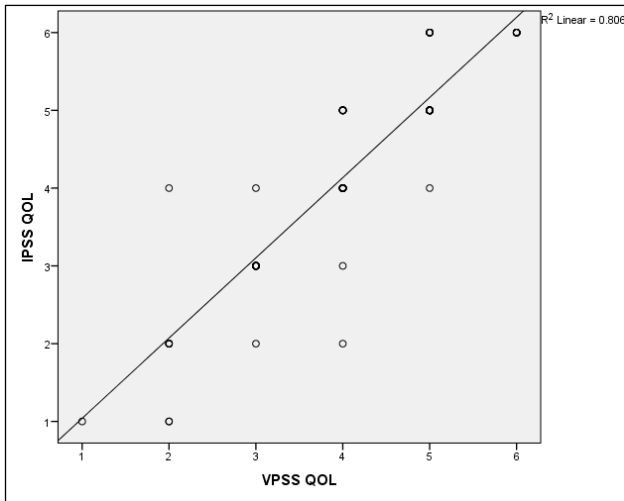


Figure 4: Scatter plot determining correlation between VPSS QoL and IPSS QoL.

DISCUSSION

The IPSS remains the current gold standard for subjective assessment of the severity of LUTS in men with symptomatic BPE though limited by some challenges. Time wasting remains a major drawback to clinic based administration of the IPSS in our environment, where patient volume is usually high, as the attending physician has to patiently interpret each IPSS question to the patient, further introducing bias and extra burden on the medical staff.⁸ Previous studies had shown that the VPSS pictogram was easier to comprehend, had the potential advantage of being understood even by men who were illiterate and that compared with the IPSS, can be completed without physician assistance by a significantly greater proportion of men, especially those with limited education within a shorter period of time.^{4,11}

In this study, the average time taken to complete the VPSS (170.51 seconds) was less than half the time required to complete the IPSS (406.42 seconds) with or without assistance irrespective of the level of education. In an earlier study in Nigeria by Abiola and colleagues, the average time required to complete the VPSS (3.45min) was about half the time required to complete the IPSS (7min), similar to what is being reported in this study.¹² These findings are similar to that reported in a study from Namibia where it was found that the VPSS took less time to complete than the IPSS, especially in men with limited education.¹³ The VPSS thus offers a faster means of assessing severity of LUTS in an environment with high patient volume, and so helps eliminate this drawback to the IPSS.

Illiteracy is a major drawback to the self-administration of the IPSS.¹⁴ Abiola et al, showed that an educational level of at least secondary school education in Nigeria (sixth-grade reading according to American educational standards) was required to complete the self-administered

IPSS questionnaire.^{12,15} Our study showed statistically significant relationship between patients' educational level and ability to complete the VPSS ($p = 0.03$) and the IPSS ($p = 0.001$), though a greater proportion (41.2%) could complete the VPSS without assistance compared to the IPSS (30.6%) irrespective of their educational level. Among the patients with limited education (those with less than secondary school education), a significantly greater proportion (21.2%) could complete the VPSS without assistance compared to the IPSS (6.0%). None of the patients with no formal education could complete the IPSS without physician assistance while three (17.6%) of this patient population completed the VPSS without physician assistance. These findings are similar to those reported in previous studies and suggest that little or no formal education is required to complete the VPSS pictogram.^{11,12,16} This is because the schematic pictogram of the VPSS can be seen and easily understood by the patients irrespective of their level of education.

This study showed statistically significant positive correlation between the VPSS and IPSS in terms of total scores ($r = +0.684$, $p = .001$) and QoL scores ($r = +0.570$, $p < 0.001$). The correlation was also statistically significant when the total scores and QoL scores were categorized into mild, moderate and severe (Table 7). The magnitude of the correlations in this study is similar to that reported by van der Walt et al ($r = 0.64$, $p < 0.001$) and Afriansyah et al ($r = +0.675$, $p < 0.001$).^{11,17} The statistically significant positive correlations between the total scores and the QoL scores reported in this study was stronger for the VPSS ($r = +0.898$) than the IPSS ($r = +0.589$) probably because more patients were able to complete the VPSS without physician assistance thereby minimizing bias. These findings indicate that the VPSS can be reliably used in place of the IPSS to subjectively assess the severity of LUTS in men with symptomatic BPE.

There was a relatively weak but statistically significant negative correlation between the total VPSS and Qmax ($r = -0.222$, $p = .041$) as well as between the total IPSS and Qmax ($r = -0.328$, $p = 0.002$). On the contrary, the correlations between VPSS QoL and Qmax ($r = -0.149$, $p = 0.17$) and IPSS QoL and Qmax ($r = -0.113$, $p = 0.30$) were not statistically significant. The correlation coefficients in this study were of similar magnitude to those reported by Heyns et al and van der Walt et al.^{4,11} The relatively weak correlations between the symptom scores and uroflowmetry parameters seen in these studies could be partly due to using only single-void flow rate measurements which may not be representative of respondents' usual flow pattern.¹⁸ This may also be responsible for why the correlation between the IPSS QoL, VPSS QoL and Qmax were not statistically significant in contrast to findings reported by Stellmacher and colleagues in which there were statistically significant correlations between Qmax and the IPSS and VPSS questions on the force of the urinary stream and QoL.¹⁹ These findings suggest that the VPSS is equivalent to the IPSS in terms of correlation with Qmax

and thus can equally be used for subjective assessment of symptomatology due to BPE.

CONCLUSION

The VPSS correlates significantly with the IPSS and is equivalent to the IPSS in terms of correlation with objective uroflowmetry parameter (Qmax). The VPSS, compared to the IPSS, can be completed without physician assistance within a shorter period of time even by patients with limited education. The VPSS is thus a valid and reliable alternative to the IPSS for subjective assessment of severity of LUTS due to BPE in a population with limited education.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

- Isaacs JT. Importance of the natural history of benign prostatic hyperplasia in the evaluation of pharmacological intervention. *Prostate.* 1990;Suppl3:1-7.
- Garraway WM, Kirby RS. Benign prostatic hyperplasia: effects on quality of life and impact on treatment decisions. *Urology.* 1994;44:629-36.
- Mc Vary KT, Roehrborn CG, Avins AL, Barry MJ, Bruskewitz RC, Donnel RF, et al. Update on AUA Guideline on the management of Benign Prostatic Hyperplasia. *J Urol.* 2011;185(5):1793-803.
- Heyns CF, Van der Walt CL, Groeneveld AE. Correlation between a new visual prostate symptom score (VPSS) and uroflowmetry parameters in men with lower urinary tract symptoms. *S Afr Med J.* 2012;102(4):237-40.
- Roehrborn CG. BPH progression: concept and key learning from MTOPS, ALTESS, COMBAT, and ALF-ONE. *BJU Int.* 2008;101:suppl 3:17-21.
- Blaivas JG, Chancellor MB, Weiss J, Verhaaren M. *Atlas of Urodynamics.* 2nd ed. Blackwell Publishing; 2007:37-45.
- Rodrigues Netto N Jr, de Lima ML, de Andrade EF, Apuzzo F, da Silva MB. Latin American study on patient acceptance of the International Prostate Symptom Score (IPSS) in the evaluation of symptomatic benign prostatic hyperplasia. *Urology.* 1997;49(1):46-9.
- Cam K, Akman Y, Cicekci B, Senel F, Erol A. Mode of administration of international prostate symptom score in patients with lower urinary tract symptoms: physician vs self. *Prostate Cancer Prostatic Dis.* 2004;7(1):41-4.
- 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.
- 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;179:2291-5.
- Van der Walt CLE, Heyns CF, Groeneveld AE, Edlin RS, van Vuuren SPJ. 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(1):17-20.
- Abiola OO, Ajape AA, Adeniyi SO, Ayeni SC. Use and ease of self-administered International Prostate Symptoms Score (IPSS) and Visual Prostate Symptoms Score (VPSS) questionnaires for the assessment of lower urinary tract symptoms in Nigerian men. *Afr J Urol.* 2016;22(2):121-6.
- Heyns CF, Stellmacher GA, van der Merwe A. Evaluation of the visual prostate symptoms score in a male population with great language diversity and limited education: a study from Namibia. *S Afr Med J.* 2014;104(5):353-7.
- Ogwuche EI, Dakum NK, Amu CO, Dung ED, Udeh E, Ramyil VM. Problems with administration of International Prostate Symptom Score in a developing community. *Ann Afr Med.* 2013;12(13):171-3.
- MacDiarmid SA, Goodson TC, Holmes TM, Martin PR, Doyle RB. An assessment of the comprehension of the American Urological Association Symptoms Index. *J Urol.* 1998;159:873-4.
- 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(1):220-4.
- Afriansyah A, Yogi Gani I, Nusali H. Comparison between visualprostate symptoms score and international prostate symptoms scorein males older than 40 years in rural Indonesia. *Prostate Int.* 2014;2(4):176-81.
- Golomb J, Lindner A, Siegel Y, Korczak D. Variability and circadian changes in home uroflowmetry in patients with benign prostatic hyperplasia compared to normal controls. *J Urol.* 1992;147(4):1044-7.
- Ushijima S, Ukimura O, Okihara K, Mizutani Y, Kawauchi A, Miki T. Visual analog scale questionnaire to assess quality of life specific to each symptom of the International Prostate Symptom Score. *J Urol.* 2006;176(2):665-71.

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Appendix 1: Visual prostate symptom score (VPSS) consisting of pictograms to evaluate (A) Force of the urinary stream, (B) Daytime frequency, (C) Nocturia, and (D) Quality of life. © 2014 Elsevier Inc.

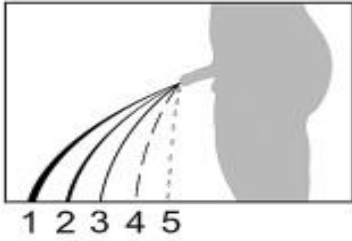
VPSS (Visual Prostate Symptom Score)

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Patient's Name:
Pasiënt se Naam:


Date:
Datum:

A




1 2 3 4 5


B




1



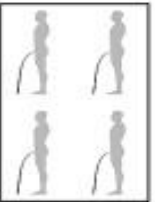
1




2




3



4




5




6 or more


C




1




1




2




3



4




5




6 or more


D




1




2




3



4



5



6

A = B = C = D = A + B + C =