# The Knowledge and Use of Frequency Volume Chart Among Nigerian Urologists

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**Background**

Lower urinary tract symptoms (LUTS) are quite common in men and increase with age.[1] In general, LUTS are divided into storage phase symptoms (frequency, urgency, urgency incontinence, and nocturia) and voiding phase symptoms, (hesitancy, weak stream, intermittency and feeling of incomplete emptying), however both Voiding and storage phase symptoms often coexist. Whereas storage phase symptoms are related to detrusor overactivity, increased bladder sensitivity or impaired compliance, voiding phase symptoms are caused by either outlet obstruction or impaired contractility. The aetiology of LUTS is multifactorial as this can be caused by structural or functional abnormalities of lower urinary tract as well as non-urological conditions.[2]

Before commencing treatment, patients with LUTS need appropriate workup. This should include: a thorough history and physical examination, with or without simple adjunctive tests (e.g.: uroflowmetry, post-void residual, and frequency volume charts). Based on this basic workup, one can then make an informed selection of initial treatment or watchful waiting.[1]

More invasive investigations like Urodynamics and cystoscopy or imaging are most useful in select cases when a specific reason is identified, the diagnosis is uncertain or when patients have failed simple initial treatments and seek further therapy.[1]

An adjunct to history is the use of validated questionnaires which is standard recommendation from published guidelines.[3,4,5] These questionnaires are useful in quantifying symptom severity, degree of border, and can be used to monitor response to treatment.[6,7,8,9] The questionnaires include: international prostate symptoms score(IPSS), The International Consultation on Incontinence Questionnaire (ICIQ-MLUTS), Danish Prostate Symptom Score (DAN-PSS), Frequency volume charts and bladder diaries.[7,8,10,11]

Information derived from subjective questionnaires like the International Prostate Symptom Score (IPSS) may be inaccurate and for this reason, both the EAU and AUA clinical practice guidelines on BPH and LUTS recommend the use of FV charts in addition to the use of symptom questionnaires when assessing men with LUTS. [12,13] The frequency volume chart (FVC) has been defined as the systematic recording of voiding habits by patients in their own environment for a specified period of time.[14]

FV chart varies from simple charts measuring the frequency and volume of each void in a day to urinary diaries which Include additional information such as fluid intake, use of pads, activities during recording, total voided volume and the fraction of urine production during the night.[15] Most commonly, the chart is filled for a period of 1-3 days as evidence have shown that filling the chart for longer periods does not give additional information.[16]

Frequency volume chart has several advantages; it is simple, easy to use and serves to extract objective information that would otherwise be difficult to obtain from history.[13] Despite these benefits, FVC is not used in the urology unit of my hospital. The aim of this study therefore, is to evaluate the knowledge and use of frequency volume chart among

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Urology specialists practicing in Nigeria and also to draw the attention of Nigerian urologists to role of this chart in the management of patients with lower urinary tract symptoms.

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## Methods

This was a cross-sectional study that assessed the knowledge and use of frequency volume chart among Urology senior registrars and consultants practicing in Nigeria. Ethical approval was obtained from our institutional ethics committee.

A population size of 134 was determined using Cochran's sample size ($n_0$) formula for a known finite population[17] and drawn from members of the Nigerian association of Urological surgeons (NAUS) which includes consultants and Urology senior registrars in NAUS WhatsApp group. The questionnaire was prepared using Google form and sent to the participants through group WhatsApp platforms.

As at the time of this study NAUS WhatsApp group had 205members. All the senior registrars included in the study had spent at least one year in Urology training. Three reminders were sent at weekly intervals after the Google form was first sent out. The study ended one week after the last response was received and this corresponded to 5 weeks from the commencement of the study.

A sample size of 134 was determined using the Cochran's sample size formula for finite population.[17] Data were analyzed using descriptive statistics of percentages, frequency and bar charts. Statistical analysis was performed using IBM SPSS (statistical package for social Science) for windows, version 21.0 (IBM Corp., Armonk, New York).

## Results

The response rate in this study was 46.27%. Respondents include Urology specialists practicing in all geopolitical zones of the country except Northeast, where no response came from. Figure 1 depicts the age distribution of the study participants with the modal age group being 41-50years. Majority of the respondents were males (96.8%) while only 3.2% were females (figure 2).

**Figure 1: age distribution of study participants.**

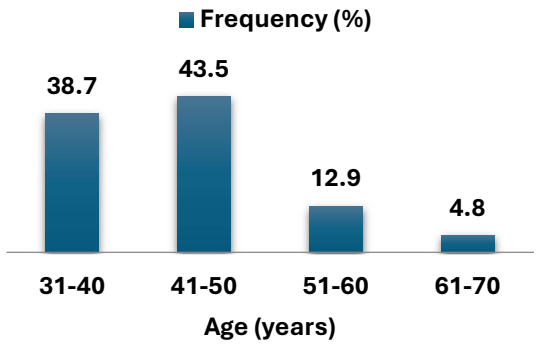
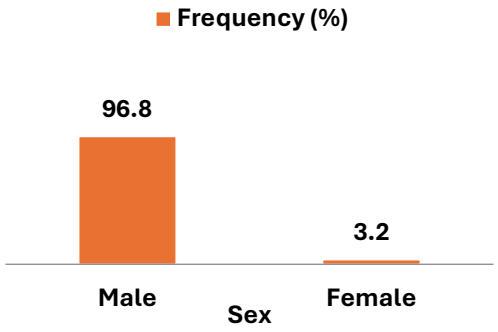
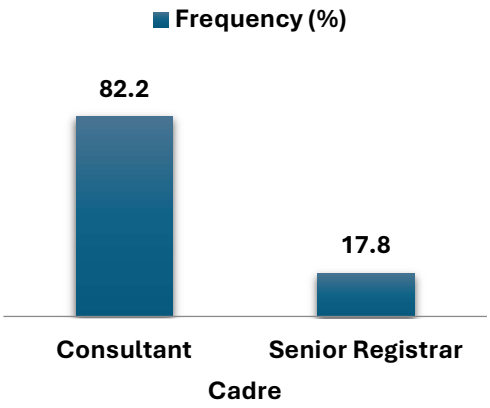



**Figure 2: sex distribution of study participants**




The majority (82.2%) of the respondents were Urology consultants while senior registrars represented only 17.8% (figure 3). The duration of Urology practice ranged from 2-31 years, with median of 9 years.

**Figure 3: cadre distribution of study participants.**




Majority (87.1) of them knew of frequency volume chart. However, less than half of the study population (43.5%) has used the chart in their practice while 56.5% have never used this instrument in their practice. Concerning what the respondents think about the usefulness of this chart, majority (93.5%) think the instrument is useful in the management of patient with LUTS while 6.5% believe the chart is not useful in-patient management.

## Discussion

This study sought to evaluate the knowledge and use of frequency volume chart among Urology specialists practicing in Nigeria. With a modal age of 41-50 years (43.5%) and 82.2% of the respondents aged 50 or less, Nigeria has a relatively young workforce compared to the United States where 44% of practicing urologists are aged greater than 55 years.[18] Urology practice in Nigeria is dominated by males as only 3.2% are female (figure 2).

This is similar, though lower than what was observed in the United States where female constitute only 11.6% of practicing Urologist.[19] The outcome of this study showed that majority of the participants knew of frequency volume chart. However, with respect to the use of this chart during management of patients with LUTS, less than half of the respondents have ever applied it. This is despite the fact that majority of the study participants agree that this tool has a place in the management of LUTS. Frequency volume chart has several advantages; it is simple, easy to use and serves to extract objective information that would otherwise be difficult to obtain from history.[13]

The European association of Urologists (EAU) and AUA clinical practice guidelines on BPH and LUTS recommend the use of FV charts in addition to the use of symptom questionnaires when assessing men with LUTS. [12,13] However, recent clinical guidelines recommend FVC assessment only in patients with a predominant storage symptom and/or nocturia.[20,21] Therefore, FVC should be selectively used according to the clinician's judgment of the patient's clinical characteristics, especially in patients with predominantly storage symptoms.

As was pointed out earlier, the aetiology of LUTS is multifactorial and can be caused by structural or functional abnormalities of lower urinary tract or non-urological conditions. This is the case particularly for nocturia.[2] Disorders of the bladder, kidneys, brain, heart and fluid intake habit can all contribute to LUTS.[13] For these reasons, FVC plays an important role in the assessment of patients with LUTS. According to Nordling, five diagnostic prototypes of FV charts have been described.[22]

These together with patient history may help categorize patients into: Type 1 with normal single volumes and normal 24 hours volume denotes normal bladder function while Type 2 with normal single volumes and increased 24 hours volume denotes normal bladder function, but with polyuria as the cause of urinary frequency, which may be due to excessive intake or secondary to diabetes or renal insufficiency. Type 3 with small single volumes during the day and night is usually due to motor or sensory urgency. Type 4 with large

morning first void volume and variable small volumes during the day is usually seen in psychosomatic conditions.

Type 5 with increased daytime urinary frequency and nocturia but with normal single and 24 h volumes suggest bladder outflow obstruction, typically due to BPH. Therefore, when correctly applied FVC can guide treatment decision and prevent unwarranted use of medications or surgical therapy.

In addition to aiding diagnosis, FVC when filled before and after intervention can help monitor the effects of treatment of LUTS irrespective of underlying pathology.[13] It has also been suggested that the use of frequency volume chart may help improve compliance particularly if the treatment is effective, as patients can observe their improved urinary habits.[13]

Though majority of our respondents knew of and believe that FVC is useful only less than half of the respondents have used this tool in patient management. The reason for low usage of this tool among the respondents is not known, however, we have observed that FVC unlike international prostate symptom score questionaries is not available in our clinics. Therefore, providing FVC in our clinics may encourage Urologist to use the chart in patient management.

**Conclusions**

Frequency volume chart is still not widely used by Nigerian Urologists. Urologists practicing in Nigeria are thereby encouraged to use this simple tool when appropriate in managing patients with LUTS as it can prevent unwarranted use of medications or surgery.

**Recommendation**

Nigerian association of Urological Surgeons should consider developing a guideline that should include use of FVC in the management of patients with LUTS. This will encourage urologist practicing in the country to make use of this instrument.

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**LIST OF ABBREVIATIONS**

| | |
|---|---|
| **LUTS** | Lower Urinary Tract Symptoms |
| **IPSS** | International prostate symptom score |
| **ICIQ** | International Consultation on Incontinence Questionnaire |
| **DAN-PSS** | Danish Prostate Symptom Score |
| **FVC** | Frequency Volume Chart |
| **EAU** | European Association of Urologist |
| **AUA** | American Urological Association |
| **NAUS** | Nigerian Association of Urological Surgeons |
| **SPPS** | Statistical Package for Social Sciences |