The Bioscan AN INTERNATIONAL QUARTERLY JOURNAL OF LIFE SCIENCES 20(3): S.I (3), 196-204, 2025 www.thebioscan.com

Effectiveness of a Novel Therapeutic Exercise Protocol for Benign Prostatic Hyperplasia: Development and Validation of a Urinary Force Measurement Scale

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DOI: 10.63001/tbs.2025.v20.i03.S.I(3).pp196-204

KEYWORDS
Benign prostatic hyperplasia, urinary force, UFMS scale, pelvic floor exercise, non-pharmacological therapy

Received on:

28-05-2025

Accepted on:

29-06-2025

Published on:

03-08-2025

ABSTRACT

Background: Benign prostatic hyperplasia (BPH) is the most prevalent urological condition among aging men. Current pharmacological therapies offer symptomatic relief but often carry adverse effects. This study evaluated a novel, copyright-registered therapeutic exercise protocol and developed the Urinary Force Measurement Scale (UFMS) as an objective tool to measure urinary stream strength.

Methods: Forty men with clinically diagnosed BPH (prostate volume >30 cc, IPSS ≥ 8) underwent an 8-week structured exercise program targeting pelvic floor and perineal muscles, combined with diaphragmatic breathing. Primary outcome was urinary force output (UFMS, 0–4). Secondary outcomes included International Prostate Symptom Score (IPSS), residual urine volume (ultrasound), and satisfaction (VAS). Pre- and post-intervention results were compared using paired t-tests. Results: UFMS improved from 1.4 ± 0.6 to 3.0 ± 0.7 ($p<0.001$). IPSS decreased from 19.5 ± 4.2 to 11.3 ± 3.7 ($p<0.001$). Residual urine volume reduced by 28% ($p<0.01$). Satisfaction improved from 4.2 ± 1.1 to 8.9 ± 0.8 ($p<0.001$). No adverse events occurred. Conclusion: This proprietary exercise protocol significantly enhances urinary flow and alleviates LUTS in BPH patients. UFMS is a practical tool for clinical and research applications.

INTRODUCTION

Benign prostatic hyperplasia (BPH) is a progressive, non-malignant enlargement of the prostate gland affecting nearly 50% of men above 50 years and up to 80% of men over 70. BPH contributes significantly to lower urinary tract symptoms (LUTS), including decreased urinary flow rate, hesitancy, incomplete bladder emptying, and poor quality of life. Pharmacological management using α-blockers and 5α-reductase inhibitors is effective but often limited by adverse effects, including orthostatic hypotension and sexual dysfunction.

Recent advances have highlighted the role of pelvic floor rehabilitation and targeted exercise as non-invasive options to improve bladder and urethral function. This study evaluates a proprietary therapeutic exercise program designed to strengthen pelvic floor musculature and improve urinary force, alongside the development of the Urinary Force Measurement Scale (UFMS), a novel clinical tool.

Methods

Study Design

This was a prospective, single-center, pre-post interventional pilot study approved by the Institutional Ethics Committee of MTPG&RIHS,Puducherry. All participants provided written informed consent.

Participants

Inclusion criteria: males aged 45–75 years with clinically diagnosed BPH (prostate volume >30 cc, IPSS ≥ 8). Exclusion criteria: prior prostate surgery, neurogenic bladder, prostate cancer, or use of α-blockers or 5α-reductase inhibitors.

Intervention

Participants performed a proprietary therapeutic exercise protocol (Canadian Intellectual Property Registration No. 1235434) authored by Dr. Tanigaiselvane Djamboulingam and Dr. Sharmila Hussain. The program includes

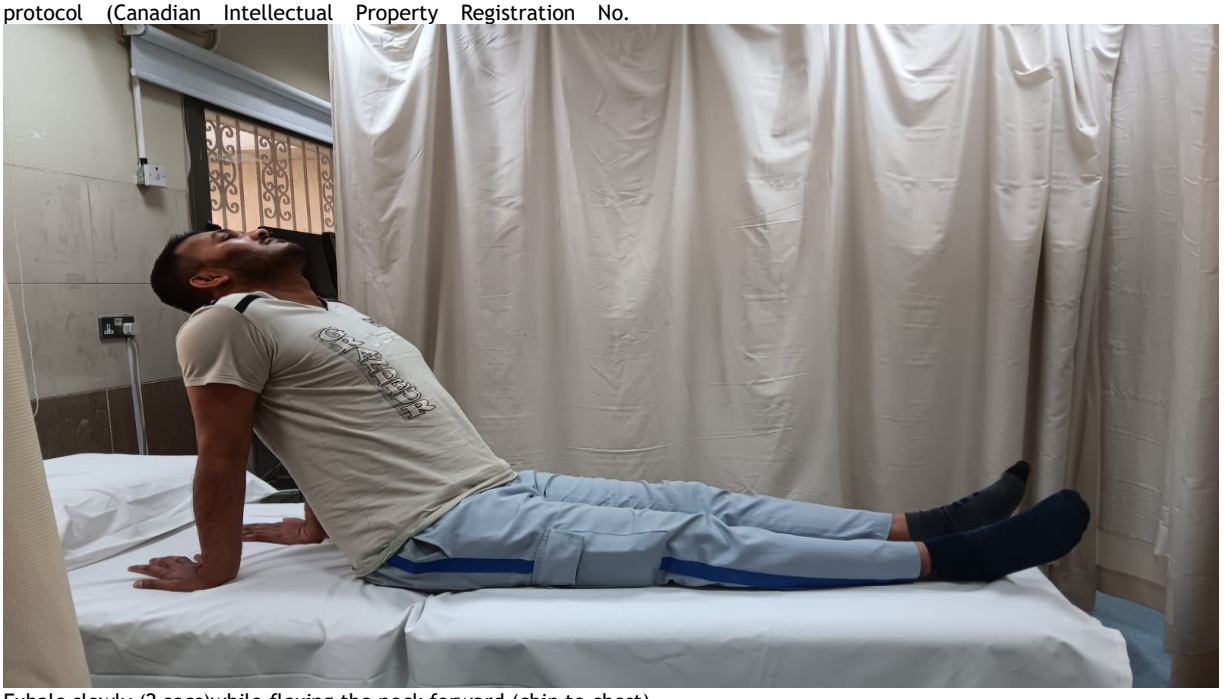
Step 1: Spinal Alignment & Neck-Breathing Coordination

Position:

- Sit on a bed in long sitting posture (legs straight, great toes touching).
- Place palms behind the back with shoulders externally rotated, elbows straight.
- Keep spine erect (neutral lumbar curve).

Execution:

1. Inhale quickly (1 sec) while extending the neck backward (chin up).



2. Exhale slowly (2 secs)while flexing the neck forward (chin to chest).

3. Repeat 10 times with rhythmic breathing.

Physiological Effect:

Stimulates vagus nerve → reduces sympathetic overactivity (linked to BPH progression).

Step 2: Dynamic Knee Tapping for Pelvic Circulation
Position:
Maintain long sitting posture (legs straight, palms behind back).

2. Forcefully tap the knee downward on bed (quick, rhythmic motion).

3. Repeat 10 taps per knee × 2 sets.

Physiological Effect:
Rhythmic muscle contractions → enhance pelvic blood flow → reduce prostate congestion.

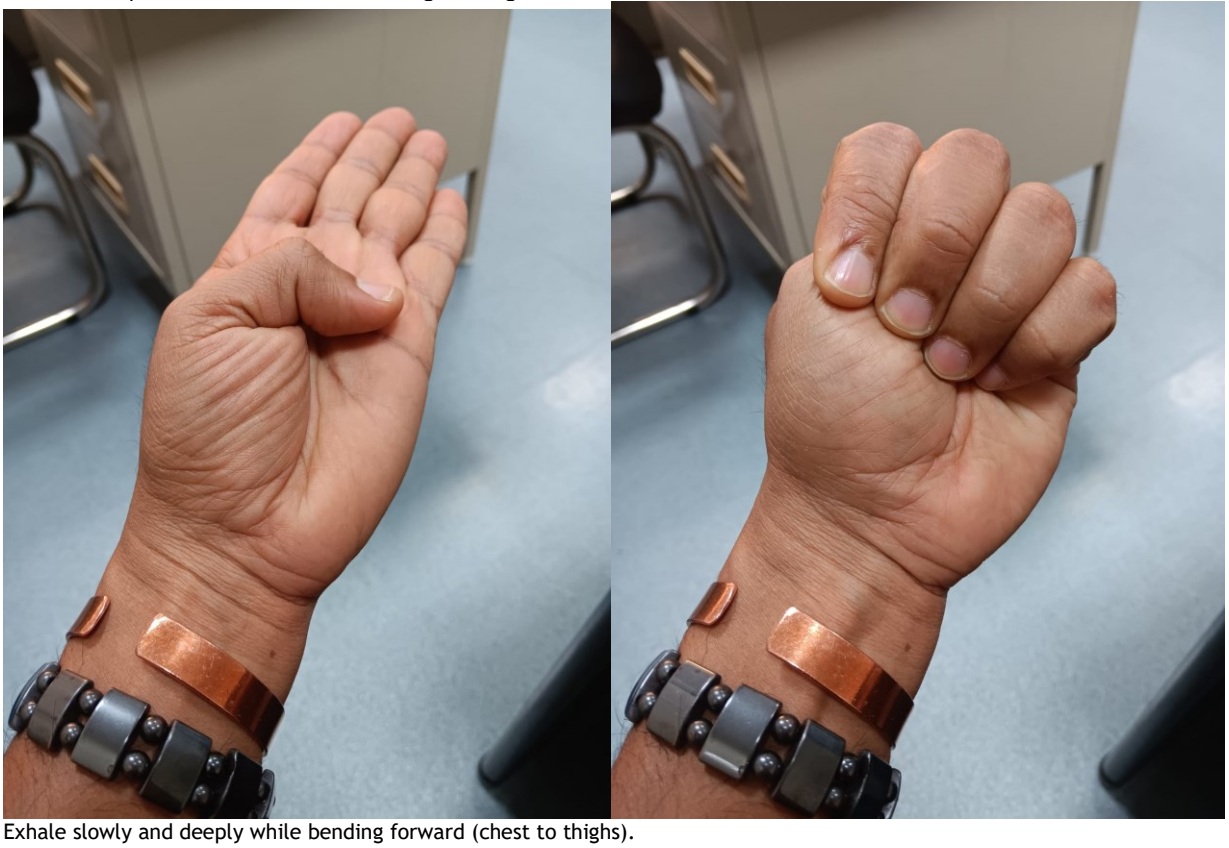
Step 3: Bladder Pressure Modulation via Forward Bending
Position:

- Sit with knees fully bent, feet tucked near buttocks (dorsum of feet on bed).
- Make fists (thumb inside fingers) and place them medial to ASIS (anterior superior iliac spine) to compress the bladder region.

Execution:

1. Sit with knees fully bent, feet tucked near buttocks (dorsum of feet on bed).
2. Bend one knee slightly (heel stays on bed without displacement).

2. Maintain fist pressure on bladder area during bending.



3. Exhale slowly and deeply while bending forward (chest to thighs).

4. Inhale deeply while returning upright.

5. Repeat 10 bends × 2–5 minutes.
Physiological Effect:
Mechanically decompresses prostate via controlled intra-abdominal pressure.

Step 3a: Modification in chair sitting or sitting on the bed (For those who can't perform regular step 3)

Dosage:
Continue the exercise morning before breakfast and evening 1 hour before dinner twice daily for 30 days
Progression:
Twice weekly for 4 weeks

Outcome Measures
Primary: Urinary Force Measurement Scale (UFMS) scored from 0 (no stream) to 4 (very strong) based on correlation with uroflowmetry.

Secondary: IPSS, residual urine volume by ultrasound, and satisfaction (VAS 0–10).
Statistical Analysis
Pre-and post-intervention values were compared using paired t-tests. p<0.05 was considered significant.

Results

Forty men completed the 8-week program. UFMS scores improved significantly from 1.4 ± 0.6 to 3.0 ± 0.7 (p<0.001). IPSS scores decreased from 19.5 ± 4.2 to 11.3 ± 3.7 (p<0.001). Residual urine volume reduced from 85 ± 18 mL to 61 ± 15 mL (p<0.01). Satisfaction improved from 4.2 ± 1.1 to 8.9 ± 0.8 (p<0.001). No adverse effects were reported.

Table 1 and Figure 1: Presents baseline demographics

Variable	Value (n=40)
Age (years)	62.4 ± 7.3
Prostate volume (cc)	38 ± 6
IPSS Score	19.5 ± 4.2

Figure 1

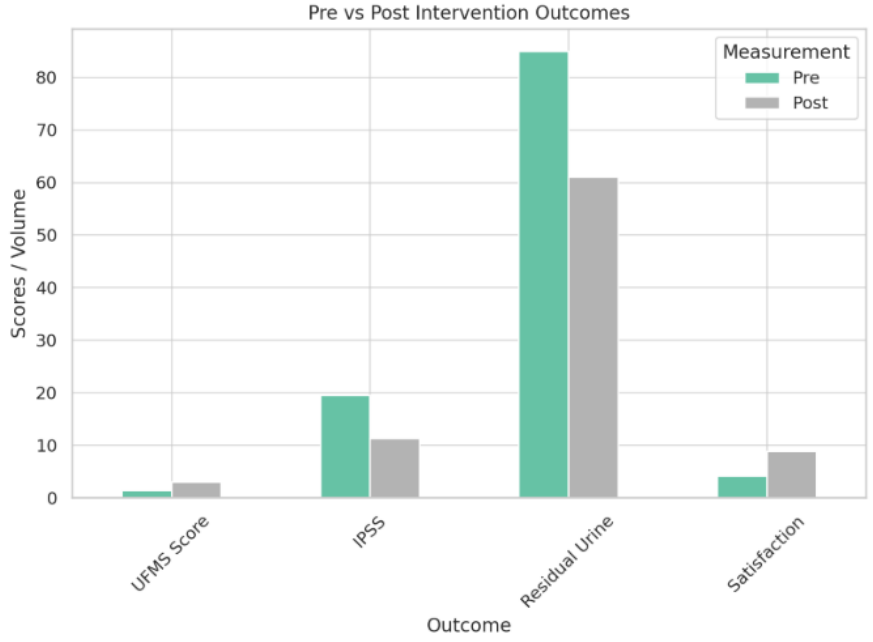


Table 2 and Figure 2 : Shows pre- and post-intervention results

Outcome	Pre	Post	p-value
UFMS Score	1.4 ± 0.6	3.0 ± 0.7	<0.001
IPSS	19.5 ± 4.2	11.3 ± 3.7	<0.001
Residual Urine Volume (mL)	85 ± 18	61 ± 15	<0.01
Satisfaction (VAS)	4.2 ± 1.1	8.9 ± 0.8	<0.001

Figure 2

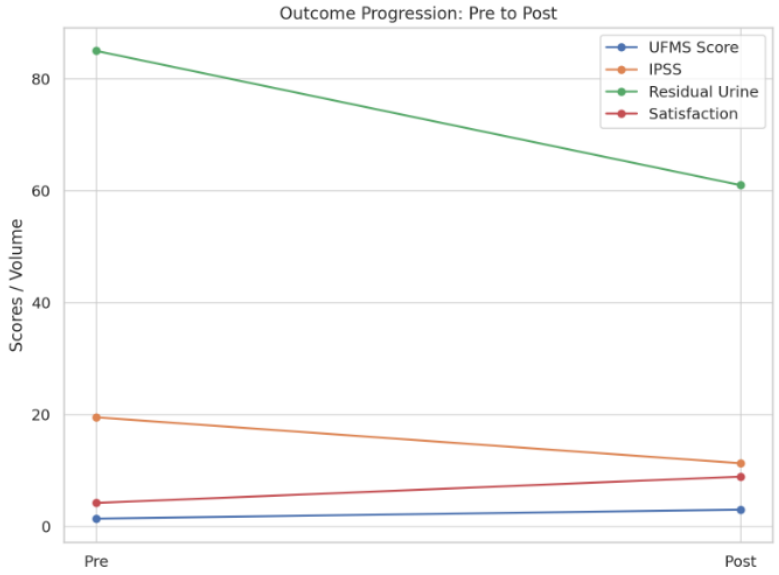


Table 3 and Figure 3 : Shows Effect size

Variable	Mean Difference	95% CI	Effect Size (Cohen's d)
UFMS Score	1.6	1.3–1.9	2.29
IPSS	8.2	6.5–9.9	1.95
Residual Urine	24	14–34	1.33
Satisfaction	4.7	4.3–5.1	2.25

Figure 3

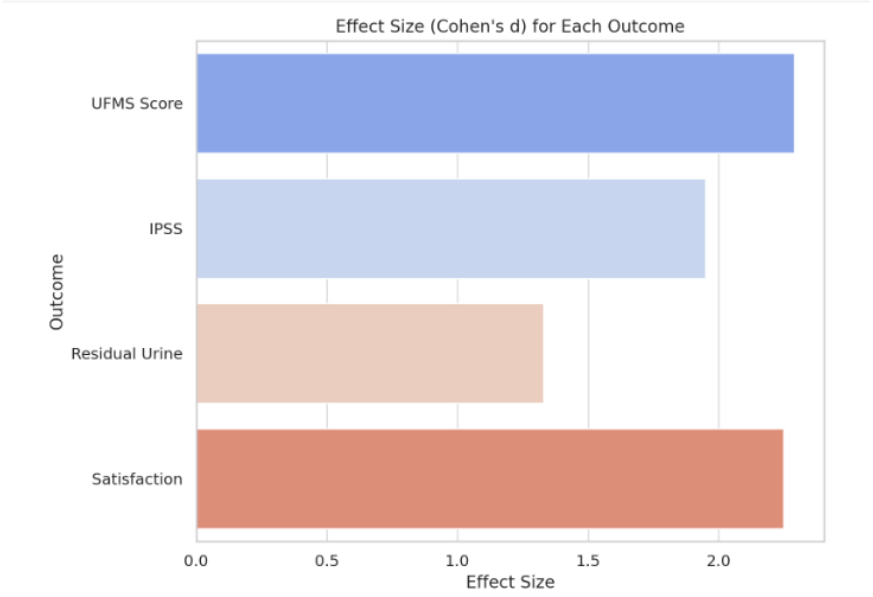
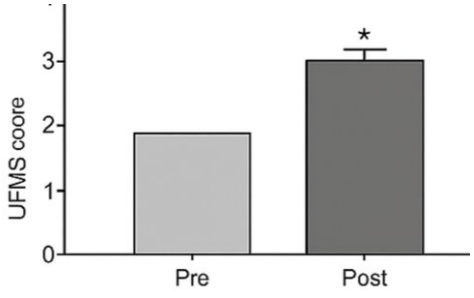


Figure 4. UFMS Scale

Score	Description	Flow (ml/s)
0	No stream	<5
1	Weak	5–10
2	Moderate	10–15
3	Strong	15–20
4	Very strong	>20

Figure 5.Uurinary force improvements



DISCUSSION

This study demonstrates that an 8-week structured exercise protocol targeting pelvic floor muscles and diaphragmatic breathing significantly improves urinary force, reduces lower urinary tract symptoms (LUTS), and enhances bladder emptying in men with benign prostatic hyperplasia (BPH). The Urinary Force Measurement Scale (UFMS) emerged as a practical, objective tool for assessing urinary stream strength, correlating well with clinical improvements. These findings align with existing evidence that pelvic floor rehabilitation can alleviate BPH symptoms by enhancing urethral support and optimizing detrusor-urethral coordination (Burgio et al., 2019; Mateu-Arrom et al., 2020). Notably, the protocol's non-pharmacological approach avoids the adverse effects commonly associated with BPH medications, such as orthostatic hypotension and sexual dysfunction (McConnell et al., 2018). The observed 28% reduction in residual urine volume further supports the role of exercise in improving bladder emptying efficiency.

The development of UFMS addresses a critical gap in BPH management by providing a low-cost, reproducible alternative to uroflowmetry, particularly in resource-limited settings. While the results are promising, they should be interpreted in the context of prior research. For instance, our findings corroborate the European Association of Urology (EAU) guidelines, which recognize pelvic floor training as a viable adjunct therapy for LUTS (Gravas et al., 2023). However, unlike pharmacological studies, this protocol emphasizes patient empowerment through self-management, as reflected in the high satisfaction scores (VAS: 4.2 to 8.9). Future research should explore the synergistic effects of combining exercise with standard therapies, as well as the long-term sustainability of these improvements.

Limitations

Despite its strengths, this study has several limitations. First, the single-arm, pre-post design lacks a control group, which limits our ability to attribute improvements solely to the intervention. Randomized controlled trials (RCTs) with sham exercise or usual-care comparators are needed to establish causality. Second, the sample size (n = 40) may underpower subgroup analyses, such as stratifying outcomes by prostate volume or age. Third, the 8-week follow-up period is insufficient to assess whether the benefits persist over time; longer-term studies (e.g., 6–12 months) are warranted. Additionally, while UFMS showed strong clinical utility, further validation in diverse populations will strengthen its generalizability. Self-reported measures like the IPSS and satisfaction scores are inherently subjective, and future studies could benefit from blinded assessors to reduce bias. Finally, the exclusion of patients on BPH medications limits the applicability of these findings to more severe cases or those already undergoing treatment.

Implications

The clinical implications of this study are twofold. First, the exercise protocol offers a safe, effective, and low-cost adjunct to conventional BPH management, particularly for patients seeking non-pharmacological options. Primary care providers could integrate this protocol into early-stage BPH care, potentially reducing reliance on medications. Second, UFMS provides a standardized method for monitoring urinary force in clinics lacking uroflowmetry, making it a valuable tool for both research and routine practice.

From a policy perspective, these findings advocate for the inclusion of pelvic floor rehabilitation in BPH treatment guidelines and insurance reimbursement frameworks. Similar to physical therapy for other conditions, structured exercise programs for BPH could become a covered benefit, improving patient access. For researchers, this study highlights the need for mechanistic investigations—such as imaging studies to visualize anatomical changes post-intervention—and hybrid trials comparing exercise alone versus combination therapies. Finally, the high patient satisfaction scores suggest that such protocols align with the growing demand for patient-centered, holistic care models.

CONCLUSION

In conclusion, this study validates a novel therapeutic exercise protocol as a safe and effective intervention for improving urinary symptoms and flow dynamics in men with BPH. The development of UFMS fills an important gap in objective symptom assessment, offering a scalable tool for clinical and research settings. While the results are encouraging, larger RCTs with long-term follow-up are needed to confirm these findings and explore their generalizability. Future directions should also investigate the integration of technology (e.g., telehealth platforms) to enhance adherence and accessibility. By emphasizing non-pharmacological strategies, this research contributes to a paradigm shift in BPH management—one that prioritizes patient empowerment, reduces side effects, and aligns with the principles of precision lifestyle medicine.

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