Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Decision Regret and Patient Satisfaction After TURP and Rezūm™ for Benign Prostatic Obstruction: A Quasi-Matched Comparative Analysis

Horst Emanuel Lagos-Beitz
Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán
Guillermo H Martínez-Delgado
Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán
Samantha Sanchez-Torres
Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán
Gabriela Neri-Moguel
Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán
Francisco Rafael Valencia-Álvarez
Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán
Guillermo Trujillo-Martínez
Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán
Rodrigo Escalante-Armenta
Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán
Jorge Augusto Alcacio-Mendoza
Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán
Ricardo Alonso Castillejos-Molina
Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán
Carlos Enrique Mendez-Probst
carlos.mendezp@incmnsz.mx

Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán

Research Article

Keywords: BPO, Rezūm™, water vapor therapy, TURP, decision regret, patient satisfaction

Posted Date: May 4th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-9322574/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Version of Record: A version of this preprint was published at World Journal of Urology on July 31st, 2026. See the published version at https://doi.org/10.1007/s00345-026-06639-z.

Abstract

Background: Patient-reported outcomes are increasingly relevant in benign prostatic obstruction (BPO), particularly when comparing procedures with different trade-offs in invasiveness, recovery, durability, and preservation of sexual function. We compared decisional regret and global satisfaction between men undergoing transurethral resection of the prostate (TURP) or Rezūm™ water vapor therapy.

Materials and Methods: We conducted a single-center retrospective quasi-matched cohort study including 187 men treated with TURP (n = 93) or Rezūm™ (n = 94). Matching was based on age and prostate volume. The primary endpoint was an adapted 5-item regret-focused postoperative measure conceptually based on the Decision Regret Scale (DRS), transformed to a 0–100 scale, with lower scores indicating less regret. The secondary endpoint was global satisfaction (0–10). Adjusted linear regression models accounted for residual baseline imbalance.

Results: Regret-focused scores were low in both groups, with median values of 0 (IQR 0–10) after TURP and 5 (IQR 0–20) after Rezūm™ (p = 0.170). Global satisfaction was higher after TURP than after Rezūm™ (median 10 [IQR 9–10] vs 9 [IQR 8–10], p = 0.002). However, in adjusted analyses, treatment type was not independently associated with either satisfaction (β = +0.52; 95% CI −0.11 to 1.15; p = 0.107) or regret (β = −1.13; 95% CI −7.86 to 5.61; p = 0.743).

Conclusions: Both TURP and Rezūm™ were associated with favorable postoperative patient-reported perceptions. Although TURP showed higher unadjusted satisfaction, no independent association between treatment type and either satisfaction or regret remained evident after adjustment.

Introduction

Benign prostatic obstruction (BPO) is highly prevalent among aging men, producing lower urinary tract symptoms (LUTS) that impair quality of life (QoL) and contribute to substantial socioeconomic burden. Nearly half of men older than 60 years and up to 90% of those over 80 experience some degree of obstruction, underscoring its public health relevance [1–3].

The therapeutic spectrum for BPO spans lifestyle modification, pharmacological management, and surgery. Transurethral resection of the prostate (TURP) remains one of the most established and widely performed reference procedures for BPO, providing durable improvements in LUTS, maximum urinary flow (Qmax), post-void residual (PVR), and symptom-related quality of life. However, TURP requires hospitalization and carries risks such as bleeding, retrograde ejaculation, and transient incontinence, which may negatively affect postoperative perception of treatment success [4].

To address some of these limitations, minimally invasive surgical therapies have been developed. Rezūm™ water vapor therapy, approved by the U.S. Food and Drug Administration, uses convective thermal energy to ablate prostatic tissue. Clinical studies have demonstrated significant improvements in International Prostate Symptom Score (IPSS), Qmax, and PVR, while preserving antegrade ejaculation

in many patients and maintaining a favorable safety profile [5–10]. At the same time, its therapeutic effect may be perceived differently from TURP because symptom improvement is often more gradual and treatment selection is frequently influenced by patient priorities regarding sexual function, recovery, and invasiveness.

While symptom relief and functional improvement remain critical, contemporary urology increasingly emphasizes patient-reported outcomes (PROs) and shared decision-making. Satisfaction and decisional perceptions may differ even when objective outcomes are favorable, particularly when procedures involve distinct trade-offs in efficacy, durability, recovery profile, sexual function, and cost [11–18].

Beyond satisfaction, decision regret, understood as distress or remorse following a healthcare choice, has emerged as a clinically relevant indicator of decision quality and expectation alignment. This construct may be particularly important in BPO, where treatment selection is preference-sensitive and often shaped by individual priorities rather than symptom severity alone [19–20].

This study aimed to compare patient-reported decision regret and global satisfaction between TURP and Rezūm™ in men treated for BPO. The primary endpoint was a 5-item regret-focused postoperative measure derived from the study questionnaire, while global satisfaction was assessed as a secondary outcome. An exploratory extended questionnaire further evaluated domains including expectations, QoL, perceived complications, and economic burden.

Materials and Methods

Study Design and Patient Selection

We conducted a single-center retrospective observational study of men treated surgically for benign prostatic obstruction (BPO) between 2018 and 2023 at a tertiary referral center. Eligible patients were identified from the institutional surgical database and outpatient follow-up records. Two cohorts were defined according to the index procedure: transurethral resection of the prostate (TURP) and Rezūm™ water vapor therapy. Because treatment allocation was not randomized and reflected routine clinical decision-making, the study was designed as a quasi-matched comparative cohort rather than a causal comparative analysis.

Consecutive potentially eligible patients were screened. Men with prior prostate surgery, active urinary tract infection at the time of treatment, neurogenic bladder, chronic urinary retention as the primary indication for surgery, or incomplete postoperative questionnaire data were excluded.

To improve comparability between groups, 1:1 matching was performed using age (± 3 years) and prostate volume (± 10 mL). These variables were selected a priori because both are clinically relevant determinants of treatment selection and postoperative outcomes in BPO. Given the observational design and the limited matching variables, residual baseline imbalance was anticipated; therefore, the resulting

cohort was considered quasi-matched, and remaining differences were addressed analytically in adjusted models.

Treatment Allocation, Perioperative Care, and Survey Administration

Treatment selection was based on routine clinical practice after physician counseling. In general, TURP was offered as a standard endoscopic option for patients seeking more immediate and definitive relief of obstruction, whereas Rezūm™ was considered for men prioritizing a minimally invasive approach and/or preservation of ejaculatory function, according to anatomical suitability and local availability. As these factors may influence postoperative perceptions, treatment allocation was considered non-random and preference-sensitive.

TURP was performed according to standard institutional endoscopic technique. A transurethral resection loop was used to resect obstructive adenomatous tissue under direct vision until an adequate channel was achieved. Postoperatively, a urethral catheter was routinely maintained overnight and removed on the first postoperative day. Follow-up was scheduled at 2 weeks for pathology review and clinical assessment, at 1 month, every 6 months during the first year, and annually thereafter.

Rezūm™ procedures were performed according to the institutional protocol based on Boston Scientific training recommendations. Patients with a median lobe were not treated with Rezūm™ in this cohort. After the procedure, patients were discharged with ibuprofen/paracetamol and a Foley catheter for 7 days. Ongoing medical therapy for BPO was continued for 1 month after treatment. Follow-up was scheduled at 7 days for catheter removal and trial of voiding, at 1 month with ultrasound and IPSS/QoL assessment, and at 3, 6, and 12 months with uroflowmetry and IPSS/QoL reassessment.

Postoperative questionnaires were administered during standard follow-up visits using the same structured survey in both groups. Survey administration followed a predefined format and was not used to guide clinical care. No patient underwent reintervention during the study period.

Outcomes and Instruments

The primary patient-reported endpoint was a 5-item regret-focused postoperative measure derived from the study questionnaire. The five items addressed confidence in the treatment decision, willingness to make the same choice again, adequacy of deliberation time, adequacy of preoperative explanation, and satisfaction with the obtained result. Each item was rated on a 5-point Likert scale (1 = strongly agree to 5 = strongly disagree) and linearly transformed to a 0–100 scale (1 = 0, 2 = 25, 3 = 50, 4 = 75, 5 = 100). The summary score was calculated as the mean of the five transformed items, with lower scores indicating more favorable decisional appraisal and less regret. Because this 5-item set was derived from the study questionnaire and does not exactly reproduce the original validated Decision Regret Scale (DRS), results were interpreted as an adapted regret-focused measure rather than as the formal Brehaut DRS [19].

The secondary endpoint was global satisfaction, assessed on a 0–10 numerical rating scale, with higher values indicating greater overall satisfaction with the procedure and its results. An exploratory non-validated extended questionnaire additionally assessed broader patient-perceived domains, including expectations/benefits, quality of life, complications/recovery, economic burden, continuity of follow-up, and procedure-related impact on sexual and daily functioning. These exploratory items were analyzed as hypothesis-generating measures only.

Covariates

Baseline covariates considered for descriptive analyses included age, prostate-specific antigen (PSA), maximum urinary flow (Qmax), post-void residual urine (PVR), prostate volume, International Prostate Symptom Score (IPSS), healthcare coverage/payment setting, and time from surgery to questionnaire completion. For multivariable analyses, the final adjustment set was defined according to covariates consistently available in the analytic dataset and included age, IPSS, prostate volume, time from surgery to questionnaire completion, and healthcare coverage/payment setting. Preoperative medical therapy was not consistently recorded and therefore was not included in adjusted models, although in routine practice men with prostates > 30 mL commonly received combination medical therapy before surgery.

Statistical Analysis

Descriptive statistics were reported as mean ± standard deviation or median (interquartile range [IQR]) for continuous variables, depending on distribution, and as counts (percentages) for categorical variables. Baseline characteristics were reported to describe the analytic cohort and to identify residual imbalance after matching.

Because the study used pairwise quasi-matching, unadjusted between-group comparisons used paired methods when appropriate, including Wilcoxon signed-rank tests for continuous outcomes and McNemar tests for binary paired variables. Given the persistence of clinically relevant baseline differences after matching, adjusted associations were additionally explored using linear regression models with cluster-robust standard errors at the matched-pair level. Because some baseline variables were not consistently available across the final analytic dataset, multivariable models were adjusted using the covariates consistently captured in both treatment groups: age, IPSS, prostate volume, time from surgery to questionnaire completion, and healthcare coverage/payment setting. The primary adjusted model used the corrected 5-item regret-focused summary score as the dependent variable, and a separate model examined global satisfaction as a secondary outcome. Sensitivity analyses were performed in patients with at least 6 months of follow-up because early postoperative perceptions may differ between procedures, particularly after Rezūm™.

Analyses involving the extended questionnaire were explicitly considered exploratory. Internal consistency was assessed with Cronbach’s alpha, and exploratory factor analysis with orthogonal rotation was used only to identify tentative latent domains rather than to validate a new instrument.

Missing data were handled by complete-case analysis for each model. All tests were two-sided, and $p < 0.05$ was considered statistically significant. The study was reported in accordance with the STROBE statement.

Ethical Considerations

The study was approved by the Institutional Review Board (IRB Reference: URO-5590-25-26-1; July 18, 2025). All data were de-identified prior to analysis, and the requirement for individual informed consent was waived in accordance with local regulations. The study was conducted in compliance with the Declaration of Helsinki. Questionnaire responses were analyzed in de-identified form and were not used to modify routine clinical care.

Results

Study cohort and baseline characteristics

A total of 187 men were included in the analytic cohort: 94 treated with Rezūm™ water vapor therapy and 93 treated with TURP. After quasi-matching by age and prostate volume, overall baseline comparability improved, although residual differences remained in several clinically relevant variables. Age was similar between groups (68.5 ± 10.1 years for Rezūm vs 67.6 ± 8.6 years for TURP), as was prostate volume (63.9 ± 25.1 mL vs 67.0 ± 24.3 mL). Baseline symptom burden, assessed by IPSS, was also comparable between groups (14 [IQR 10–18] for Rezūm vs 15 [IQR 12–21] for TURP). However, compared with the Rezūm™ cohort, TURP patients had higher PSA values, lower baseline Qmax, higher post-void residual urine volumes, and a longer interval from surgery to questionnaire completion. No patient underwent reintervention during the study period. Detailed baseline characteristics are shown in Table 1.

Table 1

Baseline characteristics of the quasi-matched cohort. Continuous variables are presented as mean ± standard deviation (SD) or median (interquartile range [IQR]), as appropriate. Residual differences after quasi-matching are shown descriptively to contextualize subsequent adjusted analyses.

Age (years), mean (SD)	**Rezūm™ (n: 94)**	**TURP (n: 93)**
	68.5 ± 10.1	**67.6 ± 8.6**
IPSS (total points), median (IQR)	14 (10–18)	15 (12–21)
PSA (ng/mL), median (IQR)	2.08 (1.2–3.9)	3.5 (2.0–5.5)
Prostate volume (mL), mean ± SD	63.9 ± 25.1	67 ± 24.3
Qmax, mL/s, median (IQR)	9.0 (6.0–11.5)	7.0 (5.0–9.0)
PVR, mL, median (IQR)	66.5 (20–152.8)	100 (45–180)
Time from surgery to questionnaire completion, months, median (IQR)	12 (6–16)	20 (13-26.8)

Primary outcome: Adapted 5-item DRS-based postoperative score

The primary adapted 5-item DRS-based postoperative score was low in both groups, indicating overall favorable decisional appraisal after surgery. Using the corrected 0–100 scoring approach, median values were 0 (IQR 0–10) in the TURP group and 5 (IQR 0–20) in the Rezūm™ group, with lower scores indicating less regret and more favorable decisional appraisal. In unadjusted comparisons, this difference did not reach statistical significance ($p = 0.170$). The distribution of scores by treatment group is shown in Fig. 1.

Secondary outcome: Global satisfaction

Global satisfaction was high in both groups, but higher in the TURP cohort than in the Rezūm™ cohort. Median satisfaction scores were 10 (IQR 9–10) for TURP and 9 (IQR 8–10) for Rezūm ($p = 0.002$). The distribution of satisfaction scores by treatment group is shown in Fig. 2.

Association between decisional regret and satisfaction

An inverse correlation was observed between the adapted DRS-based score and global satisfaction across the full cohort ($r = -0.523$, $p < 0.001$), indicating that lower regret was associated with higher overall satisfaction. This association supports the internal coherence of both patient-reported measures while suggesting that they capture related but non-identical dimensions of postoperative perception.

Adjusted analyses

Multivariable linear regression models were constructed to account for residual imbalance after quasi-matching. Using the covariates available in the analytic dataset, including age, IPSS, prostate volume, time from surgery to questionnaire completion, and healthcare coverage, TURP was not independently associated with higher global satisfaction ($\beta = +0.52$; 95% CI − 0.11 to 1.15; $p = 0.107$) or lower adapted DRS-based scores ($\beta = -1.13$; 95% CI − 7.86 to 5.61; $p = 0.743$). These findings suggest that the unadjusted difference in global satisfaction may be partly explained by residual differences in baseline or follow-up characteristics rather than by treatment type alone. Detailed model coefficients are presented in Table 2.

Table 2

Multivariable linear regression models for patient-reported outcomes. Models were adjusted for age, IPSS, prostate volume, time from surgery to questionnaire completion and healthcare coverage. Positive β coefficients indicate higher satisfaction in Model 1 and greater regret in Model 2. Estimates should be interpreted as associative rather than causal given the retrospective quasi-matched design.

Variable	β coefficient	95% CI	p-value
Model 1: Global satisfaction (0–10 scale)			
Procedure (TURP vs Rezūm)	+ 0.52	−0.11 to 1.15	0.107
Age (years)	+ 0.01	−0.01 to 0.04	0.299
IPSS (points)	−0.06	−0.10 to −0.02	0.004
Prostate volume (mL)	+ 0.01	−0.00 to 0.02	0.130
Time from surgery to questionnaire completion (months)	+ 0.01	−0.01 to 0.03	0.219
Healthcare coverage/payment setting	+ 0.05	−0.42 to 0.52	0.838
Model 2: Adapted 5-item DRS-based score (0–100)			
Procedure (TURP vs Rezūm)	−1.13	−7.86 to 5.61	0.743
Age (years)	−0.03	−0.30 to 0.24	0.843
IPSS (points)	+ 0.56	+ 0.01 to 1.12	0.047
Prostate volume (mL)	+ 0.08	−0.06 to 0.22	0.250
Time from surgery to questionnaire completion (months)	−0.12	−0.40 to 0.16	0.393
Healthcare coverage/payment setting	−4.63	−10.98 to 1.72	0.153

Sensitivity analyses

In sensitivity analyses restricted to patients assessed at least 6 months after surgery, the direction of the findings remained unchanged. TURP was not independently associated with higher satisfaction (β = +0.41; 95% CI − 0.43 to 1.24; p = 0.338) or lower adapted DRS-based scores (β = +0.12; 95% CI − 8.63 to 8.87; p = 0.978). These results suggest that differences in follow-up timing alone do not fully explain the observed patient-reported outcomes.

Exploratory factor analysis of the extended questionnaire

Exploratory analyses of the extended non-validated questionnaire suggested a multidimensional structure capturing perceived benefits, quality of life, recovery/complications, and economic burden. Internal consistency for the full item set was acceptable (Cronbach's α = 0.86), and exploratory factor

analysis yielded four tentative domains explaining 71% of the total variance. These findings should be interpreted strictly as hypothesis-generating and not as validation of a new instrument.

Discussion

Patient-reported outcomes are increasingly relevant in contemporary BPO surgery, particularly when comparing procedures with distinct trade-offs in invasiveness, durability, recovery profile, and preservation of sexual function [19–21]. In the present study, the primary endpoint was an adapted regret-focused postoperative measure conceptually based on the Decision Regret Scale (DRS), complemented by a secondary global satisfaction score and an exploratory extended questionnaire assessing expectations, quality of life, perceived complications, and financial burden. These additional domains broaden the interpretive scope of the analysis but should be regarded as exploratory, as the extended items were not formally validated.

Traditionally, healthcare quality has been assessed through objective outcomes such as morbidity and mortality. Over time, however, patient satisfaction and related patient-reported outcomes have become central components of quality assessment, reflecting the shift from a procedure-centered to a patient-centered model of care [22–27]. These perceptions are influenced not only by clinical efficacy, but also by communication, accessibility, recovery experience, and broader socioeconomic context [28–34]. In urology, such outcomes may be particularly relevant because symptom burden, help-seeking behavior, and treatment adherence are closely shaped by subjective experience [35–38].

Within this context, our findings provide comparative insight into decisional regret and global satisfaction after TURP and Rezūm™. Overall, both procedures were associated with low regret scores, suggesting favorable decisional appraisal in most patients. In unadjusted analyses, global satisfaction was higher among men treated with TURP, whereas the adapted regret-focused score did not differ significantly between groups. However, after multivariable adjustment, treatment type was no longer independently associated with either global satisfaction or regret. Taken together, these results suggest that postoperative patient perception may be influenced not only by the procedure itself, but also by residual differences in baseline characteristics, timing of outcome assessment, and contextual factors surrounding treatment selection.

From a clinical standpoint, these findings support a more nuanced interpretation of patient-reported outcomes after BPO surgery. TURP remains one of the most established reference procedures for BPO and is often perceived as a more definitive intervention, which may contribute to higher satisfaction in unadjusted comparisons, particularly when symptom relief is rapid and readily perceived [4]. By contrast, Rezūm™ offers a minimally invasive alternative that may better align with the priorities of patients seeking reduced invasiveness and preservation of antegrade ejaculation, although its symptomatic benefit may be experienced more gradually [5, 6, 9, 10]. The absence of a clear adjusted difference in regret is notable, as it suggests that both strategies may be acceptable from a patient-centered perspective when treatment expectations are appropriately aligned with procedural characteristics.

The inverse correlation observed between the adapted regret-focused score and global satisfaction supports the internal coherence of the patient-reported measures used in this study, while also indicating that decisional appraisal and satisfaction should not be interpreted as interchangeable constructs. A patient may report high overall satisfaction with care yet still evaluate the decision itself differently in retrospect depending on symptom trajectory, catheter-related experience, side effects, recovery time, or economic burden. In this setting, the findings reinforce the importance of shared decision-making and expectation setting when counseling men about BPO treatment options [11–14, 18].

This study has several strengths. It addresses an underreported aspect of BPO surgery by focusing on patient-reported decisional and satisfaction outcomes rather than relying exclusively on conventional functional parameters. It also compares two clinically relevant procedures performed in routine practice and uses a quasi-matched design to improve comparability between groups. Furthermore, the analysis accounted for residual imbalance after matching and incorporated sensitivity analyses restricted to men with at least 6 months of follow-up. Nevertheless, several limitations should be acknowledged. First, the retrospective non-randomized design introduces an inherent risk of selection bias and residual confounding. Second, treatment allocation reflected real-world decision-making and was likely influenced by clinical context, patient priorities, physician counseling, and access-related factors that cannot be fully captured in adjusted models. Third, the interval from surgery to questionnaire completion was longer in the TURP cohort, which may have influenced retrospective assessments despite sensitivity analyses. Fourth, the primary endpoint was derived from an adapted 5-item regret-focused measure conceptually based on the DRS, but it did not reproduce the original validated instrument verbatim; therefore, the findings should be interpreted as reflecting a regret-related construct rather than a formal application of the original scale. Fifth, the extended questionnaire and its factor-analytic results are exploratory and hypothesis-generating only. Sixth, the absence of standardized sexual function instruments such as the IIEF or MSHQ-EjD precludes definitive conclusions regarding ejaculatory or broader sexual outcomes, which remain important differentiators between techniques. Finally, the dual healthcare financing structure in Mexico—public coverage versus out-of-pocket payment—may have influenced patient perception of treatment burden and may limit extrapolation to more homogeneous healthcare systems [39–40].

In summary, both TURP and Rezūm™ were associated with favorable postoperative patient-reported perceptions in this cohort. Although TURP showed higher global satisfaction in the unadjusted analysis, no independent association between treatment type and either satisfaction or regret remained evident after adjustment. Rather than supporting a simple superiority framework, these findings underscore the importance of patient selection, counseling, and expectation alignment in shaping postoperative decisional regret and satisfaction after BPO surgery. Future multicenter prospective studies using standardized and fully validated decisional, symptom, and sexual-function instruments, together with more homogeneous follow-up intervals and more detailed perioperative data, are warranted to better define the determinants of patient-reported outcomes in benign prostatic obstruction.

Conclusions

In this quasi-matched retrospective cohort, both TURP and Rezūm™ were associated with favorable postoperative patient-reported perceptions, with low regret scores observed in both groups. Although TURP showed higher global satisfaction in the unadjusted analysis, no independent association between treatment type and either satisfaction or regret remained evident after multivariable adjustment. These findings suggest that postoperative patient-reported outcomes after BPO surgery are shaped not only by the procedure itself, but also by patient selection, follow-up timing, and expectation alignment. Careful counseling and shared decision-making remain essential when tailoring treatment choice to individual patient priorities.

Declarations

Acknowledgments: The authors thank the nursing and administrative teams of the Urology Department for their assistance with patient follow-up and data collection. We also acknowledge the statistical support provided by the Clinical Research Unit, which contributed to the robustness of the matching and regression analyses.

Ethical Approval: This study was approved by the Institutional Research and Ethics Committee of Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán, in compliance with the Declaration of Helsinki (IRB Reference: URO-5590-25-26-1, Date: 18/07/2025). Given the retrospective design and the use of de-identified data, the requirement for informed consent was waived by the committee.

Conflict of Interest: The authors declare no commercial or financial conflicts of interest related to this study. None of the authors have received honoraria or research funding from Boston Scientific or other manufacturers of Rezūm™ or TURP devices.

Funding: This research received no external financial support. All study procedures were institutionally funded through the Urology Department’s internal research budget.

Data Availability: The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request, in accordance with institutional policies and patient confidentiality standards.

Author Contributions

H.E.L.B: Project development, data collection, manuscript writing and manuscript editing.

G.H.M.D: Project development, statistical analysis, manuscript writing and manuscript editing.

S.S.T: Data collection, manuscript writing

G.N.M: Data collection, manuscript writing

F.R.V.A: Manuscript writing

G.T.M: Manuscript editing.

R.E.A: Manuscript editing.

J.A.A.M: Project development, manuscript writing and manuscript editing

R.A.C.M: Project development, manuscript writing and manuscript editing

C.E.M.P: Project development, manuscript writing and manuscript editing.

All authors approved and contributed to the final manuscript.

References

1. Zhang SJ, Qian HN, Zhao Y, et al. Relationship between age and prostate size. *Asian J Androl.* 2013;15(1):116–120. doi:10.1038/aja.2012.127
2. Westwood J, Geraghty R, Jones P, Rai BP, Somani BK. Rezūm: a new transurethral water vapour therapy for benign prostatic hyperplasia. *Ther Adv Urol.* 2018;10(11):327–333. doi:10.1177/1756287218793084
3. Gravas S, Gacci M, Gratzke C, et al. Summary paper on the 2023 European Association of Urology guidelines on the management of non-neurogenic male lower urinary tract symptoms. *Eur Urol.* 2023;84(2):207–222. doi:10.1016/j.eururo.2023.03.012
4. Miernik A, Gratzke C. Current treatment for benign prostatic hyperplasia. *Dtsch Arztebl Int.* 2020;117(49):843–854. doi:10.3238/arztebl.2020.0843
5. Samir M, Elaal AAA, Gad KAS, Basyony MW. Two-year follow-up comparing Rezūm therapy versus bipolar transurethral resection of the prostate for treating benign prostatic hyperplasia: a prospective randomized study. *Int J Urol.* 2024;31(5):545–550. doi:10.1111/iju.15410
6. Babar M, Loloi J, Tang K, Syed U, Ciatto M. Emerging outcomes of water vapor thermal therapy (Rezūm) in a broad range of patients with lower urinary tract symptoms secondary to benign prostatic hyperplasia: a systematic review. *Low Urin Tract Symptoms.* 2022;14(3):140–154. doi:10.1111/luts.12435
7. McVary KT, Roehrborn CG, Avins AL, et al. Update on AUA guideline on the management of benign prostatic hyperplasia. *J Urol.* 2011;185(5):1793–1803. doi:10.1016/j.juro.2011.01.074
8. Gratzke C, Bachmann A, Descazeaud A, et al. EAU guidelines on the assessment of non-neurogenic male lower urinary tract symptoms including benign prostatic obstruction. *Eur Urol.* 2015;67(6):1099–1109. doi:10.1016/j.eururo.2014.12.038
9. Magistro G, Chapple CR, Elhilali M, et al. Emerging minimally invasive treatment options for male lower urinary tract symptoms. *Eur Urol.* 2017;72(6):986–997. doi:10.1016/j.eururo.2017.07.005

10. Mynderse LA, Hanson D, Robb RA, et al. Rezūm system water vapor treatment for lower urinary tract symptoms/benign prostatic hyperplasia: validation of convective thermal energy transfer and characterization with magnetic resonance imaging and 3-dimensional renderings. *Urology.* 2015;86(1):122–127. doi:10.1016/j.urology.2015.03.021
11. Al-Abri R, Al-Balushi A. Patient satisfaction survey as a tool towards quality improvement. *Oman Med J.*2014;29(1):3–7. doi:10.5001/omj.2014.02
12. Aharony L, Strasser S. Patient satisfaction: what we know about and what we still need to explore. *Med Care Rev.*1993;50(1):49–79. doi:10.1177/002570879305000104
13. Drain M. Quality improvement in primary care and the importance of patient perceptions. *J Ambul Care Manage.*2001;24(2):30–46. doi:10.1097/00004479-200104000-00005
14. Wong EL, Coulter A, Cheung AW, Yam CH, Yeoh EK, Griffiths S. Item generation in the development of an inpatient experience questionnaire: a qualitative study. *BMC Health Serv Res.* 2013;13:265. doi:10.1186/1472-6963-13-265
15. Ahmad I, Nawaz A, Khan S, Khan H, Rashid M, Khan M. Predictors of patient satisfaction. *Gomal J Med Sci.*2012;9(2):178–182.
16. Pascoe GC. Patient satisfaction in primary health care: a literature review and analysis. *Eval Program Plann.*1983;6(3–4):185–210. doi:10.1016/0149-7189(83)90002-2
17. Jenkinson C, Coulter A, Bruster S, Richards N, Chandola T. Patients' experiences and satisfaction with health care: results of a questionnaire study of specific aspects of care. *Qual Saf Health Care.* 2002;11(4):335–339. doi:10.1136/qhc.11.4.335
18. Rama Mohan DD, Kanagaluru Sai Kumar D. A study on the satisfaction of patients with reference to hospital services. *ZENITH Int J Bus Econ Manage Res.* 2011;1:31–39.
19. Brehaut JC, O'Connor AM, Wood TJ, et al. Validation of a decision regret scale. *Med Decis Making.*2003;23(4):281–292. doi:10.1177/0272989X03256005
20. Real Academia Española. *Diccionario de la lengua española.* Madrid: RAE; 2024. Accessed September 15, 2024. https://dle.rae.es/satisfacer
21. Capuzzo M, Alvisi R. Is it possible to measure and improve patient satisfaction with anesthesia? *Anesthesiol Clin.*2008;26(4):613–625. doi:10.1016/j.anclin.2008.07.008
22. Wazir A, Shukla A, Dutton RP. Patient satisfaction in anesthesia: implementation, relevance, and identification of meaningful measures. *Adv Anesth.* 2018;36(1):23–37. doi:10.1016/j.aan.2018.07.012
23. Cleary PD, Edgman-Levitan S, Roberts M, et al. Patients evaluate their hospital care: a national survey. *Health Aff (Millwood).* 1991;10(4):254–267. doi:10.1377/hlthaff.10.4.254
24. Fung D, Cohen MM. Measuring patient satisfaction with anesthesia care: a review of current methodology. *Anesth Analg.* 1998;87(5):1089–1098. doi:10.1097/00000539-199811000-00020
25. Health Services Research Group. A guide to direct measures of patient satisfaction in clinical practice. *CMAJ.*1992;146(10):1727–1731.

26. Cleary PD, McNeil BJ. Patient satisfaction as an indicator of quality care. *Inquiry.* 1988;25(1):25–36.
27. Vuori H. Patient satisfaction—an attribute or indicator of the quality of care? *QRB Qual Rev Bull.* 1987;13(3):106–108. doi:10.1016/S0097-5990(16)30116-6
28. Donabedian A. *An Introduction to Quality Assurance in Health Care.* New York, NY: Oxford University Press; 2003:21–33.
29. Crow R, Gage H, Hampson S, et al. The measurement of satisfaction with healthcare: implications for practice from a systematic review of the literature. *Health Technol Assess.* 2002;6(32):1–244. doi:10.3310/hta6320
30. Finkelstein BS, Singh J, Silvers JB, Neuhauser D, Rosenthal GE. Patient and hospital characteristics associated with patient assessments of hospital obstetrical care. *Med Care.* 1998;36(8 Suppl):AS68–AS78. doi:10.1097/00005650-199808001-00008
31. Young GJ, Meterko M, Desai KR. Patient satisfaction with hospital care: effects of demographic and institutional characteristics. *Med Care.* 2000;38(3):325–334. doi:10.1097/00005650-200003000-00009
32. Hall JA, Dornan MC. Patient sociodemographic characteristics as predictors of satisfaction with medical care. *Soc Sci Med.* 1990;30(7):811–818. doi:10.1016/0277-9536(90)90205-7
33. Nguyen Thi PL, Briançon S, Empereur F, Guillemin F. Factors determining inpatient satisfaction with care. *Soc Sci Med.* 2002;54(4):493–504. doi:10.1016/S0277-9536(01)00045-4
34. Boudreaux ED, Ary RD, Mandry CV, McCabe B. Determinants of patient satisfaction in a large, municipal ED: the role of demographic variables, visit characteristics, and patient perceptions. *Am J Emerg Med.* 2000;18(4):394–400. doi:10.1053/ajem.2000.7316
35. Marschall-Kehrel D, Roberts RG, Brubaker L. Patient-reported outcomes in overactive bladder: the influence of perception of condition and expectation for treatment benefit. *Urology.* 2006;68(2 Suppl):29–37. doi:10.1016/j.urology.2006.02.046
36. Heidrich SM, Wells TJ. Effects of urinary incontinence: psychological well-being and distress in older community-dwelling women. *J Gerontol Nurs.* 2004;30(5):47–54. doi:10.3928/0098-9134-20040501-10
37. Avery JC, Stocks NP, Duggan P, et al. Identifying the quality of life effects of urinary incontinence with depression in an Australian population. *BMC Urol.* 2013;13:11. doi:10.1186/1471-2490-13-11
38. Kravitz RL. Patient satisfaction with health care: critical outcome or trivial pursuit? *J Gen Intern Med.*1998;13(4):280–282. doi:10.1046/j.1525-1497.1998.00084.x
39. National Institute for Health and Care Excellence (NICE). *Rezum for treating lower urinary tract symptoms secondary to benign prostatic hyperplasia (MTG49).* NICE; 2020. Accessed December 8, 2025. Available from: https://www.nice.org.uk/guidance/mtg49
40. Blissett RS, Blissett DB, Oselin M, et al. Transurethral water vapor therapy for treatment of lower urinary tract symptoms secondary to benign prostatic hyperplasia: a cost-minimization and budget impact analysis from an Italian healthcare perspective. *Minerva Urol Nephrol*. 2023;75(3):343-352. doi:10.23736/S2724-6051.22.05020-0

Figures

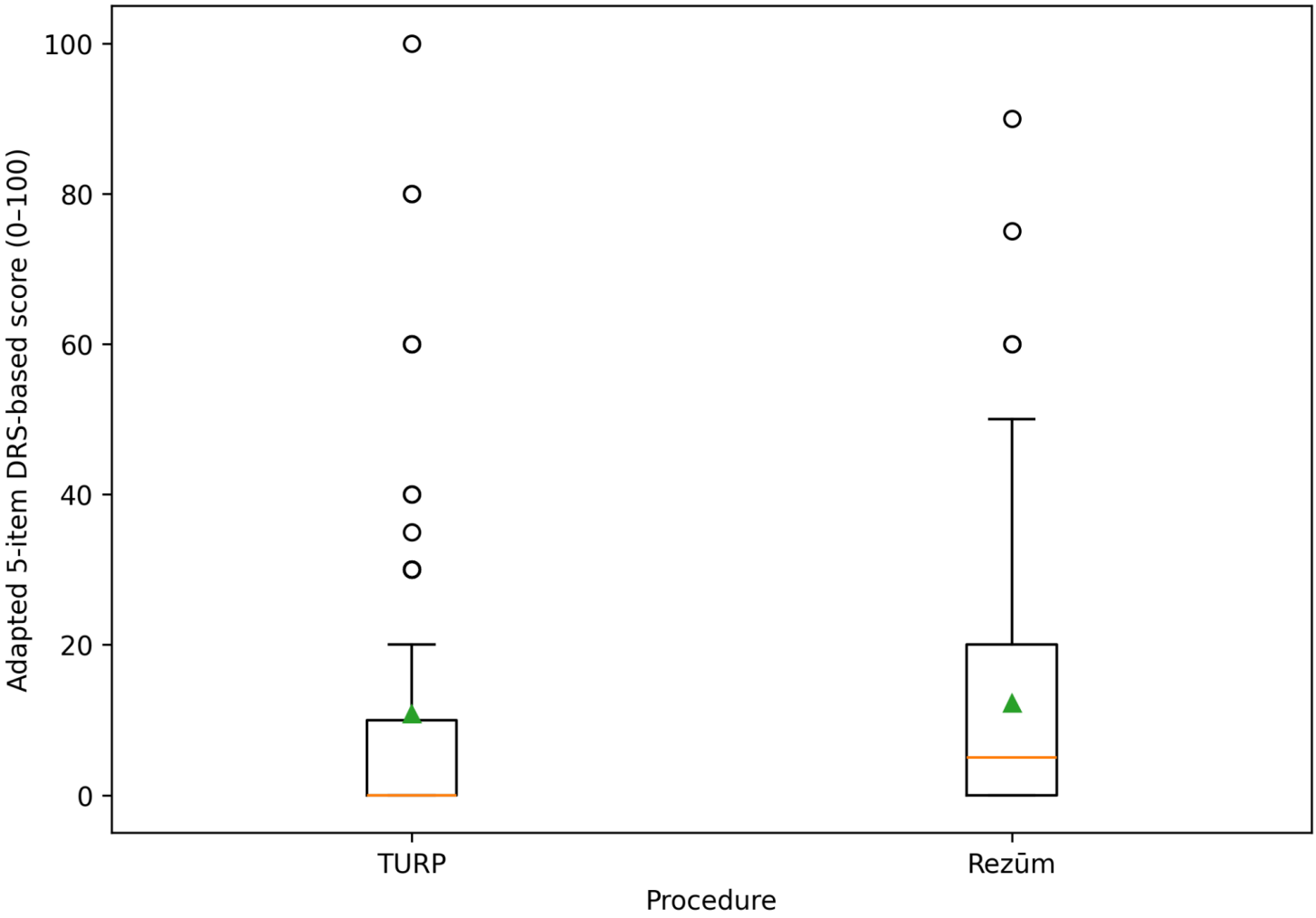


Figure 1

Distribution of the adapted 5-item DRS-based postoperative score by treatment group. Boxplots represent the median (center line), interquartile range (box), and mean value (white circle). Lower scores indicate less regret and more favorable decisional appraisal. Both groups showed low regret scores overall, and the unadjusted between-group difference was not statistically significant (p = 0.170).

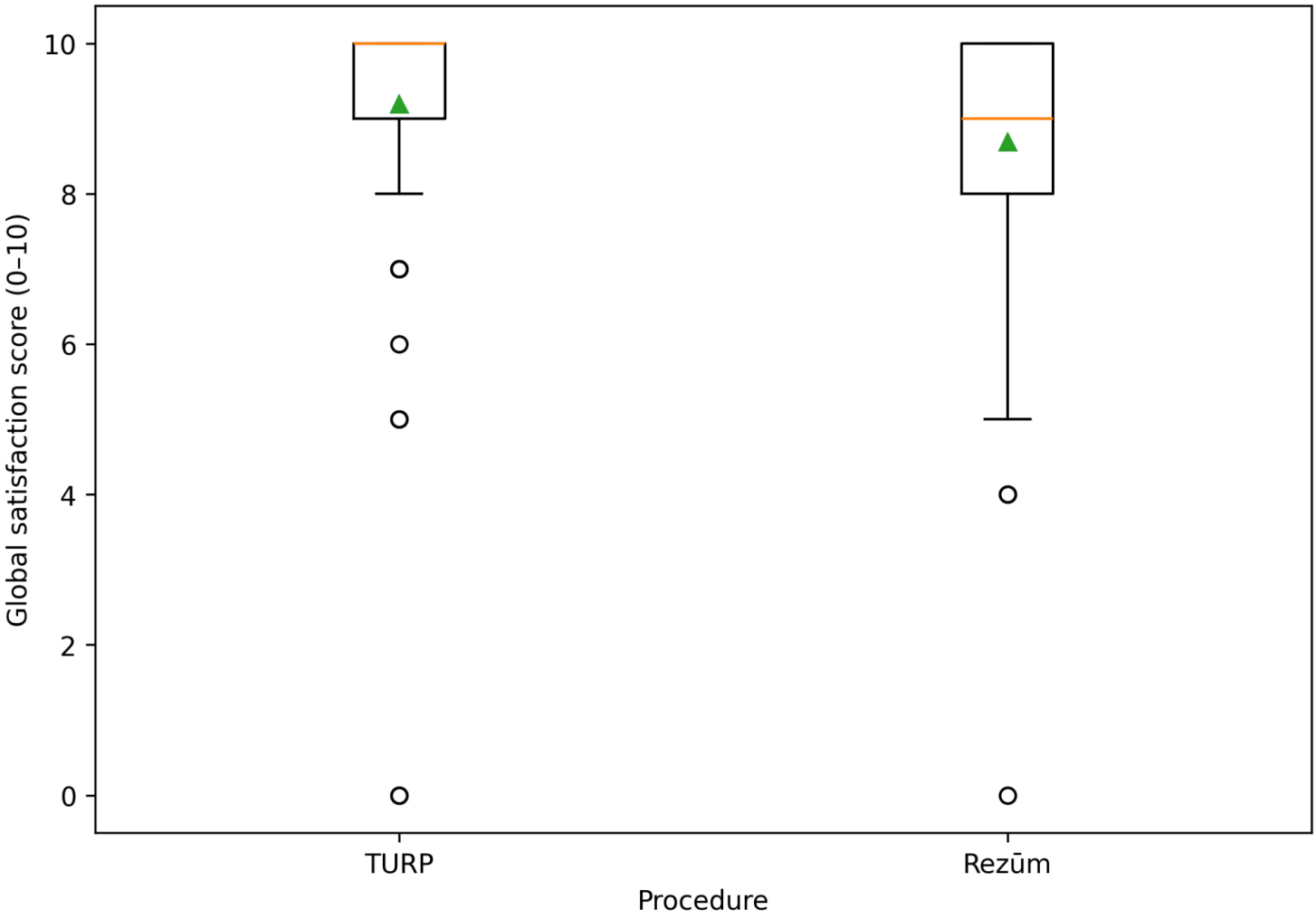


Figure 2

Distribution of global satisfaction scores (0–10) by treatment group. Boxplots represent the median (center line), interquartile range (box), and mean value (white circle). Higher scores indicate greater overall satisfaction. TURP patients reported higher satisfaction scores than Rezūm patients in the unadjusted analysis (p = 0.002).