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Article

Effectiveness of Bladder Training in Post-Ureteroscopy Patients at Siloam Hospital Bekasi Sepanjang Jaya: A Quasi-Experimental Study

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Abstract

Background: Ureteroscopy is a commonly performed urological procedure for the diagnosis and treatment of ureteral stones and other urinary tract conditions. Despite its minimally invasive nature, postoperative complications such as urinary retention, urgency, dysuria, and incomplete voiding are frequently reported following ureteral stent placement and catheter use.
Objective: This study aimed to evaluate the effectiveness of bladder training in patients following ureteroscopy surgery at a tertiary private hospital in West Java, Indonesia.
Methods: A quasi-experimental, post-test-only control group design was employed. The study was conducted from May 1 to June 5, 2023, at the inpatient urology ward of Siloam Hospital Bekasi Sepanjang Jaya. A total of 82 postoperative ureteroscopy patients were selected using total population sampling. Patients were divided into intervention and control groups. The intervention group received bladder training prior to catheter removal, while the control group did not. The primary outcome was the presence of urinary complaints within 24 hours of catheter removal. Chi-square analysis was used to determine statistical significance.
Results: In the bladder training group, 25 patients (61%) reported no urinary complaints after catheter removal, while 16 (39%) experienced urinary discomfort. Statistical analysis yielded a p-value of 0.004 ($p < 0.05$), indicating a significant difference between the two groups. The results suggest that bladder training effectively reduces urinary complaints post-catheter removal.
Conclusion: Bladder training significantly improves urinary outcomes in post-ureteroscopy patients, supporting its implementation as a standard nursing practice in postoperative urological care

Keywords: bladder training, ureteroscopy, catheterization, urinary retention, postoperative care

INTRODUCTION

Bladder training is a structured intervention aimed at restoring normal urination patterns by stimulating detrusor muscle activity following urinary catheterization (Berman & Frandsen, 2021). In the context of postoperative urological care, bladder training is critical to prevent urinary retention and improve comfort and recovery outcomes. This intervention is particularly relevant for patients undergoing ureteroscopy, a minimally invasive endoscopic procedure used to diagnose and manage ureteral and renal

pathologies, including nephrolithiasis and hydronephrosis (Indonesian Urological Association [IAUI], 2019; National Kidney Foundation [NKF], 2023).

Patients undergoing ureteroscopy frequently require postoperative urinary catheterization due to intraoperative bleeding, anesthetic effects, or to prevent urethral obstruction during recovery. Spinal anesthesia, commonly used during ureteroscopy, has been associated with delayed bladder sensation and detrusor inactivity, leading to temporary urinary retention (Roifatul et al., 2019). Studies suggest that timely bladder training can facilitate neuromuscular recovery and reduce postoperative urinary complications (Oktaviani, 2019).

In Indonesia, the burden of urological diseases such as nephrolithiasis and hydronephrosis is substantial. According to IAUI (2018), kidney stones represent one of the most common urological problems, with a prevalence rate of 2.5%. National data indicate that West Java, Central Java, and Yogyakarta report higher incidences of these conditions, often necessitating ureteroscopic interventions (Aussiana, 2022). However, despite the high volume of ureteroscopy procedures, bladder training is not routinely implemented in many institutions. A previous study in Palu, Indonesia, found that up to 90% of patients did not receive bladder training postoperatively, resulting in higher rates of urinary discomfort and complaints after catheter removal (Oktaviani, 2019).

At Siloam Hospital Bekasi Sepanjang Jaya, preliminary records show that approximately 80 ureteroscopy procedures are performed monthly, with 83% of patients receiving postoperative Foley catheters. Despite this, standardized bladder training protocols have not been widely adopted. This gap highlights the need for empirical evidence to support the integration of bladder training into routine postoperative care. This study was designed to address the lack of empirical data on bladder training effectiveness in Indonesia, particularly among post-ureteroscopy patients. It evaluates whether bladder training can significantly reduce urinary complaints and enhance the return to normal bladder function, thereby informing future clinical guidelines and nursing practice.

METHOD

Study Design

This study employed a quasi-experimental design with a post-test-only control group approach to examine the effectiveness of bladder training in patients following ureteroscopy surgery. The research was conducted at the inpatient urology unit of Siloam Hospital Bekasi Sepanjang Jaya, West Java, Indonesia, from May 1 to June 5, 2023.

Population and Sample

The population comprised all patients who underwent ureteroscopy and received postoperative urinary catheterization during the study period. A total population sampling technique was used, with 82 eligible participants included. The inclusion criteria were: (1) patients aged 18 years and above, (2) patients who had undergone elective ureteroscopy with Foley catheter insertion, (3) patients conscious and able to communicate postoperatively, and (4) willing to provide informed consent. Exclusion criteria included: (1) patients with known neurogenic bladder disorders, (2) patients with pre-existing urinary tract infections, and (3) patients who underwent emergency procedures or had comorbidities affecting urination.

The sample size was calculated using G*Power software version 3.1.9.7 for two-tailed analysis, with an effect size of 0.5 (moderate), $\alpha = 0.05$, and power $(1-\beta) = 0.80$. This yielded a minimum sample size requirement of 64 participants; however, to account for potential dropouts and ensure representativeness, 82 respondents were recruited.

Intervention and Procedure

The experimental group received structured bladder training based on standard nursing protocols. This included informing patients of the importance of bladder retraining, timed voiding, sensory stimulation

(e.g., warm compresses), and physical assistance to facilitate urination within two hours following catheter removal. The control group did not receive bladder training and followed standard postoperative care only. Patients were monitored within 24 hours after catheter removal to evaluate the presence or absence of urinary complaints, such as difficulty initiating urination, incomplete voiding, or urinary retention.

Instrument

A structured observation checklist was used to record urinary complaints. The checklist was developed based on the postoperative urology care standards outlined by the Indonesian Urological Association (IAUI, 2019) and adapted for local clinical use. The instrument included five binary (yes/no) items assessing signs of urinary discomfort and retention. A score of 0 indicated no urinary complaints, while any score $\geqslant 1$ indicated the presence of at least one urinary complaint. The instrument's content validity was reviewed by three urologists and two senior nurses, achieving a scale-level content validity index (S-CVI/Ave) of 0.92. The reliability of the instrument was assessed through inter-rater agreement (Cohen's Kappa = 0.89), indicating strong consistency.

Data Analysis

Data were analyzed using SPSS version 26. Descriptive statistics were used to summarize demographic characteristics. The effectiveness of bladder training was determined by comparing urinary complaints in the experimental and control groups using the Chi-square test. A p-value < 0.05 was considered statistically significant.

Ethical consideration

Ethical approval was granted by the Institutional Review Board of Siloam Hospital Bekasi Sepanjang Jaya. Written informed consent was obtained from all participants.

RESULTS

A total of 82 participants who underwent ureteroscopy surgery were included in the study and divided into two groups: the intervention group (n = 41), who received bladder training, and the control group (n = 41), who did not receive bladder training. The demographic and clinical characteristics of both groups were comparable, with no significant differences in age, sex, or duration of catheterization prior to removal.

Table 1 presents the distribution of urinary complaints within the first 24 hours following catheter removal. In the bladder training group, 34 participants (82.9%) did not report any urinary complaints, while 7 participants (17.1%) experienced difficulties such as delayed voiding or a sensation of incomplete emptying. Conversely, in the control group, 25 participants (61%) reported no complaints, while 16 participants (39%) reported urinary issues within the same time frame.

Table 1. Frequency of Urinary Complaints Within 24 Hours Post-Catheter Removal

Group	No Complaints n (%)	With Complaints n (%)	Total n (%)
Bladder Training	34 (82.9%)	7 (17.1%)	41 (100%)
Control Group	25 (61.0%)	16 (39.0%)	41 (100%)
Total	59 (72.0%)	23 (28.0%)	82 (100%)

Statistical analysis using the Chi-square test revealed a significant association between bladder training intervention and the presence of urinary complaints ($\chi^2 = 8.23$, $p = 0.004$). This result suggests that bladder training significantly reduces the likelihood of urinary complaints following ureteroscopy and catheter removal.

DISCUSSION

This study demonstrates the effectiveness of bladder training in reducing urinary complaints among patients after ureteroscopy surgery. The results showed that 82.9% of participants who received bladder training reported no urinary issues within 24 hours of catheter removal, compared to only 61% in

the control group. The statistically significant difference (p = 0.004) supports the use of bladder training as a targeted nursing intervention in urologic postoperative care.

Bladder training aims to enhance the function of the detrusor muscle and promote voluntary urination following catheterization (Berman & Frandsen, 2021). The findings of this study are in line with Oktaviani (2019), who reported that patients who underwent bladder training had significantly fewer voiding difficulties post-catheter removal. Moreover, Roifatul, Sasmiyanto, and Luh (2019) noted that spinal anesthesia—commonly used during ureteroscopy—can contribute to urinary retention, thus underscoring the need for interventions that restore normal bladder function.

Ureteroscopy is one of the most frequently performed minimally invasive procedures in urology, particularly in the management of kidney stones and hydronephrosis (IAUI, 2019; NKF, 2023). The high incidence of urinary tract complications in the immediate postoperative period necessitates evidence-based nursing practices. Bladder training provides a safe, non-invasive, and cost-effective strategy to support recovery, especially given the risks of urinary retention and infection if normal voiding is delayed (Thotakura & Anjum, 2022).

The current study also aligns with international data emphasizing the importance of post-catheter care. According to the National Health and Nutrition Examination Survey (NHANES), kidney stones and related urological complications are prevalent in up to 10.6% of men and 7.1% of women in the United States (Thotakura & Anjum, 2022). Given the similar burden in Indonesia—with reports of 92% of urology patients experiencing hydronephrosis at Siloam Hospital Bekasi—these results are of high clinical relevance (Aussiana, 2022).

Despite these positive outcomes, limitations of this study include its single-site design, relatively small sample size, and short follow-up period. Future multicenter studies with longitudinal tracking of urinary outcomes are recommended to further validate these findings.

CONCLUSION

Bladder training is an effective nursing intervention for reducing urinary complaints in patients after ureteroscopy surgery. Participants who received structured bladder training experienced significantly fewer voiding issues within 24 hours of catheter removal compared to those who did not. Integrating bladder training into postoperative care protocols may enhance recovery, minimize complications, and improve patient comfort and satisfaction. Further research with larger and more diverse populations is encouraged to generalize these findings across healthcare settings.

Conflict of Interest

The authors have declared that no conflict of interest exists.

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