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Original Research Article

Adherence to evidence-based guidelines for prevention of urinary retention in hip surgery patients: a multicentre observational study

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Abstract

Urinary retention is a healthcare complication putting patients at risk of unnecessary suffering and harm. Orthopaedic patients are known to face an increased such risk, calling for evidence-based preoperative assessment and corresponding measures to prevent bladder problems. The aim of this study was to evaluate healthcare professionals' adherence to risk assessment guidelines for urinary retention in hip surgery patients. This was an observational study from January 2021 to April 2021 with a descriptive and comparative design, triangulating three data sources: (I) Medical records for 1382 hip surgery patients across 17 hospitals in Sweden were reviewed for preoperative risk assessments for urinary retention and voiding-related variables at discharge; (II) The patients completed a survey regarding postoperative lower urinary tract symptoms, and; (III) data were extracted from a national quality registry regarding type of surgery, preoperative physical status, and perioperative urinary complications. Group differences were analysed with Chi-square/Fisher's exact test, *t*-test, Wilcoxon rank-sum test, or Mann–Whitney U-test. Logistic regression was used to analyse variables associated with completed risk assessments for urinary retention. Of all study participants, 23.4% (n = 323) had a preoperative documented risk assessment of urinary retention. Whether a risk assessment was performed was significantly associated with acute surgery [odds ratio (OR) 3.56, 95% confidence interval (CI) 2.48–5.12] and undergoing surgery at an academic hospital (OR 4.59, 95% CI 2.68–7.85). Acute patients were more often affected by urinary retention and had bladder issues and/or an indwelling catheter at discharge. More than every tenth patient (11. 9%, n = 53) completing the survey experienced intensified bladder problems after their hip surgery. The study shows a lack of adherence to risk assessment for urinary retention according to evidence-based guidelines, which negatively affects quality of care and patient safety.

Keywords: evidence-based practice; hip surgery; orthopaedic care; postoperative complications; risk assessment; urinary retention

Introduction

Hip surgery, due to trauma or hip arthrosis, is one of the most common hospital procedures worldwide. Globally, there are at least 2.5 million hip fractures each year, increasing annually with an aging global population [1]. In connection with surgery, patients face challenging factors, such as pain, immobilization, and medications known for increasing the risk of developing urinary retention (UR) pre-, peri-, or postoperatively [2]. The risk of UR following hip surgery is between 5% and 70% [3, 4], affecting a vast number of patients worldwide every year. Risk factors for postoperative UR are patient-related (age, medical background) or intervention-related (type of surgery, anaesthesia, analgesics) [3], with an increased risk of UR after orthopaedic procedures and with older age [5]. Earlier studies have shown that UR increases the length of hospital stay for orthopaedic patients [6, 7], and is associated with increased hospital costs [8]. Furthermore, there is also a link between UR and early and late complications after hip surgery, such as, initially delirium, and/or infection, and later on, voiding issues such as incontinence [3].

An adverse event like UR can be most preventable by ensuring the performance of evidence-based procedures [9]. There is a growing amount of proof for procedural guidance, and

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easily available national evidence-based practice (EBP) guidelines has been specifically developed for the prevention of bladder complications in hospital care in Sweden [10], in accordance with international literature. The guidelines were launched online in 2015 and disseminated through a platform available for free to all healthcare staff and organizations. These clinical practice guidelines include [10]:

- A risk assessment for UR performed within 24 h of admission to hospital, recorded as no risk, general risk, or high risk.
- Systematic monitoring of the bladder and voiding-related actions such as when to use catheterization during hospital care.
- For patients undergoing surgery, a preoperative ultrasound scanning of the bladder volume should be performed shortly before the start of anaesthesia, indicating what further assessments and actions are needed during surgery.

Yet, prior studies indicate that the guidelines are neither fully known nor used by healthcare professionals in orthopaedic care and rehabilitation [11], and bladder distension is still a common adverse event in orthopaedic care [12, 13], challenging patient safety and prolonging hospital stays [14]. What is more, an unexpectedly high incidence of asymptomatic UR in older patients following hip fracture repair has been reported (88%) [12]. Increased attention is needed for both early risk assessments and continued assessments, and actions to prevent bladder issues throughout a patient's hospital stay. While patients who are at high risk for postoperative UR should be counselled preoperatively [15], the full account of healthcare staffs' recognition of risk assessment guidelines for UR in orthopaedic care due to hip surgery is not known. Rather, a better understanding of how the guidelines are exercised will guide further implementation efforts to progress EBP. This study's primary aim was to evaluate healthcare professionals' adherence to risk assessment guidelines for UR in hip surgery patients within 24 h of admission to the hospital. In addition, the study entailed to:

- describe UR and other voiding variables documented during the perioperative period and at discharge,
- describe patients' experience of postoperative lower urinary tract symptoms and actions taken, and
- explore what factors were associated with a performed risk assessment for UR.

Methods

This was an observational study with a descriptive and comparative design, reported according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines [16].

Study setting

The study was part of a cluster-randomized trial—the Onset PrevenTIon of urinary retention in Orthopaedic Nursing and rehabilitation (OPTION) study [17]. There were 55 eligible orthopaedic care units performing hip surgery in Sweden. The sample size for this study was based on a power analysis performed for the primary outcome (adherence to bladder monitoring guidelines) in the OPTION trial and resulted in a required sample size of 20 units with a total of 1500 patients. A strategic sampling was used with the intention of heterogeneity regarding differences such as size of hospital and geographical location. Some units declined participation due to staffing issues or heavy workload during the pandemic, resulting in 17 participating units, randomized to control or intervention site. These units were located across academic, general, and local hospitals, and at the time of this study, they performed either or both acute and elective hip surgery. The head of unit at each orthopaedic clinic gave consent for the study to take place before we proceeded with the data collection. OPTION was registered in the US National Institutes of Health Clinical Trials Registry, ID NCT04700969.

Study participants

Patients were included in the study if they had undergone hip surgery at either of the 17 units between 8 January 2021 and 15 April 2021, and were $\geq$18 years old. Following ethics approval and agreements from all unit heads, lists of patients matching these criteria were obtained. No information regarding who consented (or did not consent) was reported to the units. For further details of the inclusion of study participants, see Fig. 1.

Data collection

Three different sources were used for data collection: review of medical records, a patient survey, and extracts from a quality registry.

Medical records

Electronic medical records of all hip surgery patients (n = 1382) for the data collection period were reviewed retrospectively in 2022. Data were collected for documentation of preoperative UR risk assessment and urinary tract variables at discharge (UR, urinary tract infection, micturition difficulties, indwelling catheter, intermittent catheter, toilet assistance, and the usage of incontinence protection products). Risk assessment for UR is a commended nursing responsibility—consequently, these data were pursued from the nursing admission documentation. Regarding urinary tract variables at discharge, we searched the documentation from all healthcare professionals at each orthopaedic unit for both diagnose codes and documentation in free text. Before initiating the review, the participating researchers established a consensus on the interpretation and assessment of all search variables. Any disagreements that arose during the review were promptly addressed and clarified, to maintain a consistent approach. Difficulties in bladder emptying were defined as the sensation of not being able to empty the bladder as usual, including a weaker stream or/and increased frequency. The need for toilet assistance was defined as any need for human support during micturition, such as someone helping the patient to/from the toilet, and/or assisting in handing the patient toilet paper or with wiping. The review of medical records was carried out by three researchers on the OPTION team (two PhD candidates and a senior researcher), coordinated by the development and agreement process described above.

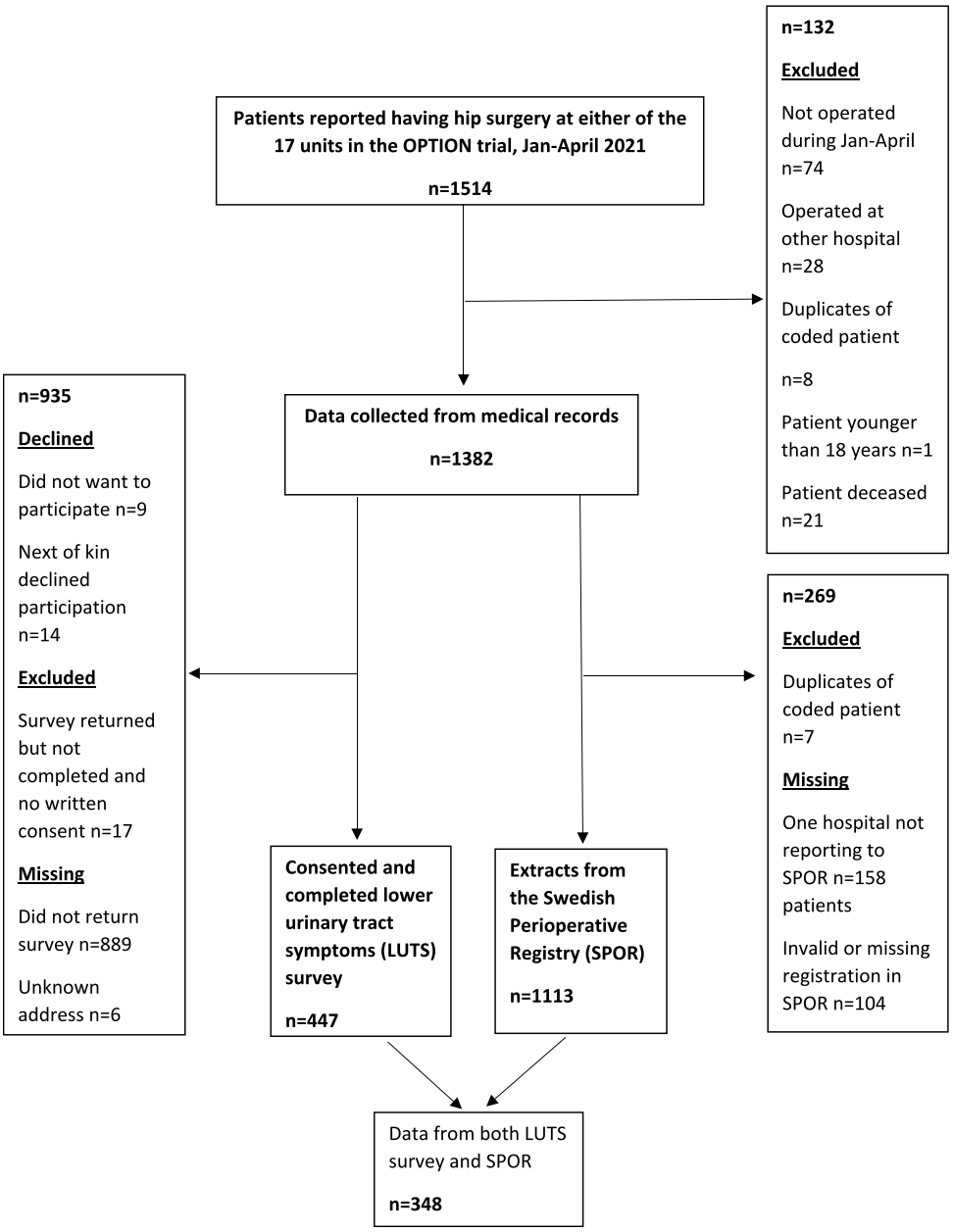

Figure 1 Study enrolment and data collection presented in a flow diagram.

Patient-reported lower urinary tract symptoms

Information about the study was sent to all eligible patients at 2 weeks to 2 months after their surgery, along with a study-specific survey regarding postoperative lower urinary tract symptoms. The survey contained queries with fixed response alternatives about the patient's ability to empty the urinary bladder, technique(s) for bladder emptying, use of incontinence protection products, and healthcare contacts made for micturition difficulties. If consenting, the patients completed the survey and sent it to the researchers in a prepaid envelope along with their consent form. In total, 482 patients agreed to and completed the survey.

The Swedish perioperative registry

The Swedish Perioperative Registry (SPOR) is a national quality registry with detailed data on surgical interventions [18]. A structured extract was obtained with data on type of surgery, acute or elective surgery, preoperative physical status measured by the American Society of Anaesthesiologists' (ASA) classification [19], diagnosis codes, and perioperative urinary complications. One out of 17 units in the OPTION study did not report to SPOR, leaving this source representing 16 sites and a total of 1113 patients. ASA classification and type of surgery was searched for manually in medical records for the unit not registering in SPOR ($n = 158$).

Statistical analysis

Basic descriptive statistical analyses were used to describe the study population, and the population was divided into two groups (acute or elective surgery) due to significant differences between these groups in age, sex, ASA classification, previous lower urinary tract disorders, and length of hospital stay.

Table 1. Patient characteristics of the study population, divided into acute or elective hip surgery.

	All patients ($n = 1382$)	Acute hip surgery ($n = 715$) 51.7%	Elective hip surgery ($n = 667$) 48.3%	*P*-value[a]
Age (years), median (IQR)	77 (69–85)	83 (77–90)	72 (63–77)	<.001
Sex, *n*(%)				
Female	867 (62.7)	469 (65.6)	398 (59.7)	.026
ASA classification, *n*(%)	1292 (93.5)	637 (89.1)	655 (98.2)	<.001
I	135 (10.4)	24 (3.8)	111 (16.9)	
II	608 (47.1)	177 (27.8)	431 (65.8)	
III	497 (38.5)	384 (60.3)	113 (17.3)	
IV	52 (4.0)	52 (8.1)	0 (0.0)	
Previous urinary tract disorders,[b] *n* (%)	40 (2.9)	30 (4.2)	10 (1.5)	.006
Hospital length of stay in days, median (IQR)	2 (1–5)	5 (3–7)	1 (1–2)	<.001
Hospital type, *n* (%)				<.001
Academic hospital	65 (4.7)	32 (4.5)	33 (4.9)	
General regional hospital	676 (48.9)	526 (73.6)	150 (22.5)	
General local hospital	641 (46.4)	157 (21.9)	484 (72.6)	

IQR = Interquartile Range, ASA = American Society of Anaesthesiologists.
[a]*P*-value represents the difference between the acute and elective group.
[b]Documented in medical records as: chronic catheter, urostomy, uni/bilateral nephrostomy, clean intermittent catheterization, incontinence, enlarged prostate causing residual urine, suprapubic catheter.

Comparisons were made between patients undergoing acute or elective hip surgery; depending on the distribution of the data, categorical parameters were analysed with Chi-squared or Fisher's exact test and continuous parameters with *t*-tests or Wilcoxon rank sum test. Mann–Whitney U-test was used for ordinal data and continuous data with skewed distribution.

Binary logistic regression was used to identify factors associated with adherence to risk assessment for UR (dependant variable). These factors were chosen in accordance with earlier studies in the field. When performing analyses, we categorized the variable age at surgery into two groups (<80 and ≥80) due to our distribution of eligible data. The ASA classification was divided into two groups: ASA I (normal healthy patient) + ASA II (patient with mild systemic disease), and ASA III + ASA IV (patients with severe systemic diseases), as is commonly seen in similar studies. The variable of hospital type was divided into two groups—academic and general hospitals, where general hospitals represented both regional and local general hospitals. Initially, univariate analyses were used to study each independent variable with the odds ratio (OR) for performed risk assessment for UR (see Supplementary file 1). Secondly, multivariate logistic regression was used stepwise, for further analysis of the adjusted associations, and was presented as OR with 95% confidence intervals (CI).

Statistical analyses were conducted using IBM Statistical Package for the Social Sciences (SPSS) Statistics, version 29.0. A random sample of 5% of the data was drawn and controlled before statistical analysis, which showed full accuracy. Statistical significance was set at a two-sided value of $P < .05$.

Ethics and other permissions

All methods were carried out in accordance with relevant guidelines and regulations. Ethical approval from the Swedish Ethical Review Authority was obtained for the OPTION trial, including this study (ID 2020-06140; 2021-01710; 2021-02434; 2021-03755 and 2021-05341-02). Briefly, the ethics procedures signified that patients having had hip surgery during the defined data collection period received written information clarifying that participation was voluntary, that confidentiality was guaranteed, and that they could withdraw from the study at any time. The information also contained contact details to clinical experts, offering a route to raise any medical or health concerns stirred by the survey questions. Patients who made contact were advised where to turn for further help, including how to file a complaint.

Results

Characteristics of the study population

During the study period, in total 1382 patients underwent hip surgery at the 17 units included in OPTION and met the inclusion criteria; their characteristics are described in Table 1. Hip surgery was performed either electively (mainly due to arthrosis) or acutely (hip fracture due to trauma) and there was an even distribution between these two groups. Significant differences were seen between acute and elective surgery regarding age, sex, ASA classification, previous urinary tract symptoms, hospital length of stay, and hospital type. Hip surgery in this cohort was mainly performed at general regional or general local hospitals.

Data from medical records and quality registry

For the study population, risk assessment for UR within 24 h from admission to hospital was documented for 23.4% ($n = 323$) of the included patients, with a significantly higher prevalence of performed risk assessment among the acute hip surgery group compared to the elective group ($P < .001$). Urinary retention was documented in 1.8% ($n = 25$) of the patient records, and 6.2% of the patients ($n = 85$) had recorded difficulties in bladder emptying at discharge. Compared to the elective group, patients in the acute group had significantly higher frequency of UR ($P < .001$), difficulties in bladder emptying ($P = .002$) and an indwelling catheter at discharge ($P < .001$). Only 11 patients had a documented adverse event in the SPOR quality registry (peri- and postoperative catheter complications $n = 2$, bladder distension $n = 4$, unplanned catheterization $n = 5$). Further voiding-related documentation and differences between groups are described in Table 2.

Table 2. Adherence to risk assessment for urinary retention and documented urinary tract variables at discharge.

	All patients ($n = 1382$)	Acute hip surgery ($n = 715$)	Elective hip surgery ($n = 667$)	*P*-value[a]
Risk assessment for urinary retention performed within 24 h from admission, *n* (% of total)	323 (23.4)	241 (33.7)	82 (12.3)	<.001
Documented in medical records at discharge; *n* (%)				
Urinary retention	25 (1.8)	21 (2.9)	4 (0.6)	<.001
Missing[b]	5 (0.4)	5 (0.7)	0 (0.0)	
Difficulties bladder emptying	85 (6.2)	58 (8.1)	27 (4.0)	.002
Missing[b]	4 (0.3)	4 (0.6)	0 (0.0)	
Indwelling urinary catheter	195 (14.1)	181 (25.3)	14 (2.1)	<.001
Previously indwelling catheter	14 (1.0)	12 (1.7)	2 (0.3)	
Missing[b]	4 (0.3)	4 (0.6)	0 (0.0)	
Intermittent catheter	12 (0.9)	9 (1.3)	3 (0.4)	.147
Previously intermittent catheter	7 (0.5)	3 (0.4)	4 (0.6)	
Missing[b]	4 (0.3)	4 (0.6)	0 (0.0)	
Need for toilet assistance	141 (10.2)	139 (19.4)	2 (0.3)	<.001
Missing[b]	3 (0.2)	3 (0.4)	0 (0.0)	
Use of incontinence protection products	158 (11.4)	149 (20.8)	9 (1.3)	<.001
Missing[b]	3 (0.2)	3 (0.4)	0 (0.0)	
Urinary tract infection	54 (3.9)	53 (7.4)	1 (0.1)	<.001
Missing[b]	3 (0.2)	3 (0.4)	0 (0.0)	

[a]*P*-value represents the difference between the acute and elective group.,
[b]Missing data due to nephrostomy, urostomy, or deceased.

Patient-reported lower urinary tract symptoms

Of all study participants, 32.3% ($n = 447$) consented to and completed the survey about postoperative lower urinary tract symptoms. The majority of the survey respondents had elective surgery ($n = 336$, 75.2%), 12.5% ($n = 56$) had initiated contact with healthcare due to lower urinary tract symptoms and 11.9% ($n = 53$) experienced worsened ability to empty the bladder post-surgery. The orthopaedic units were seldom contacted when experiencing lower urinary tract symptoms postoperative (2.0% of all patients, $n = 9$), but some had contacted their primary care physician (4.0%, $n = 18$) or other caregivers (6.5%, $n = 29$). The permanent use of incontinence protection products was reported by 14.8% ($n = 66$) of the patients. Further details of patient-reported lower urinary tract symptoms are presented in Table 3.

Risk assessment for UR and associated factors

Performed risk assessment for UR within 24 h from admission to hospital was significantly associated with acute surgery (OR 3.56, 95% CI 2.48–5.12) and being operated on at an academic hospital (OR 4.59, 95% CI 2.68–7.85). For additional details, see Table 4.

Discussion

Statement of principal findings

In the present study, we found a low adherence to risk assessment for UR for hip surgery patients according to medical records, yet with an association between performed risk assessment and acute surgery and/or receiving care in an academic hospital. Furthermore, despite UR and other postoperative lower urinary tract symptoms, few patients had contacted the healthcare about their voiding issues.

The results of this study complement earlier findings, reflecting the importance of early detection and prevention of UR [9]. It also fortifies insufficient adherence to EBP guidelines for bladder monitoring in orthopaedic care [11, 20]. The results reinforce the need for improved everyday procedures to improve quality and safety in surgical care [21]. The review of medical records showed a lack of documentation of risk assessment for UR, which likely reflects that risk assessments were not performed. The variation in vocabulary and the use of local institutional consensus instead of routine adoption of EBP guidelines for assessment and documentation has been noted earlier in a prior study on the use of urinary catheters after common general or orthopaedic surgery [22]. This puts patients at risk of missed opportunities within and along their care trajectory. The supposed lack of adherence to EBP guidelines is problematic and calls for quality improvements for increased patient safety and concerns both for further implementation of guidelines and actions for a refinement in care documentation. The low level of UR documentation in patients' medical records could also be troublesome for the patient, since earlier UR is a risk factor of recurrent UR but if left undocumented it remains invisible to healthcare professionals.

Strengths and limitations

Our multicentre study has provided extensive data representing a sizeable number of hip surgery patients with a variation of both acute and elective hip surgery patients, and a broad representation in age, ASA classification, and sex. This increases sample heterogeneity, decreases selection bias, and increases generalizability of the study's findings.

Bias during the review was minimized by agreement prior to data collection, and through discussions on how best to interpret documentation in medical records, to reach an equivalent approach. The retrospective design used in this study is

Table 3. Patient-reported lower urinary tract symptoms post-surgery.

Self-reported question areas	All patients ($n = 1382$)	Acute hip surgery ($n = 715$)	Elective hip surgery ($n = 667$)	*P*-value[a]
Available answers, *n* (%)	447 (32.3)	111 (15.5)	336 (50.4)	
Ability to empty the bladder, *n* (%)				.003
Worse than before	53 (11.9)	23 (20.7)	30 (8.9)	
Same as before	379 (84.8)	84 (75.7)	295 (87.8)	
Better than before	13 (2.9)	3 (2.7)	10 (3.0)	
Missing[b]	2 (0.4)	1 (0.9)	1 (0.3)	
Technique for bladder emptying, *n* (%)				<.001
Indwelling catheter	10 (2.3)	9 (8.3)	1 (0.3)	
Intermittent catheter	9 (2.0)	3 (2.8)	6 (1.8)	
No catheter	423 (95.7)	96 (88.9)	327 (97.9)	
Missing[b]	5 (1.1)	3 (2.7)	2 (0.6)	
Use of incontinence protection products, *n* (%)				<.001
Every day/night	66 (14.8)	38 (34.2)	28 (8.3)	
Only day or night	15 (3.4)	5 (4.5)	10 (3.0)	
Occasionally	46 (10.3)	12 (10.8)	34 (10.1)	
Only day/night/or occasionally	1 (0.2)	1 (0.9)	0 (0.0)	
Never	318 (71.1)	54 (48.7)	264 (78.6)	
Missing[b]	1 (0.2)	1 (0.9)	0 (0.0)	
Contacts taken with healthcare due to voiding issues, *n* (%)				<.001
Orthopaedic unit	9 (2.0)	5 (4.5)	4 (1.2)	
Primary care	18 (4.0)	9 (9.0)	6 (2.4)	
Other caregiver	29 (6.5)	16 (14.4)	13 (3.9)	
No contacts taken	391 (87.5)	80 (72.1)	311 (92.5)	
Missing[b]	0 (0.0)	0 (0.0)	0 (0.0)	

[a]*P*-value represents the difference between the acute and elective group.,
[b]Missing due to intermittent catheter, urostomy, or missing answer.

Table 4. Multivariate analysis of factors associated with preoperatively performed risk assessment for urinary retention in hip surgery patients.

Explanatory variable	Multivariate OR (95 % CI)	*P*-value
Age at surgery (years)		.250
<80	Reference	
≥80	0.83 (0.59–1.15)	
Sex		.342
Male	Reference	
Female	1.15 (0.86–1.55)	
ASA classification		.064
ASA I + II	Reference	
ASA III + IV	1.36 (0.98–1.87)	
Previous documented urinary tract disorders[a]		.943
No	Reference	
Yes	0.97 (0.44–2.16)	
Type of surgery		<.001
Elective	Reference	
Acute	3.56 (2.48–5.12)	
Hospital type		<.001
General hospital	Reference	
Academic hospital	4.59 (2.68–7.85)	

OR = odds ratio, CI = confidence interval
ASA = American Society of Anaesthesiologists

[a]documented in medical records as; chronic catheter, urostomy, uni/bilateral nephrostomy, clean intermittent catheterisation, incontinence, enlarged prostate causing residual urine, suprapubic catheter.

a limitation, as we are not able to control or further assess the documented risk assessment, or the completeness of the medical records. The response rate of the patient survey was low, mainly representing the elective group and only representing patients able to understand Swedish.

Interpretation within the context of the wider literature

The low proportion of documented UR (1.8%) in our study population is not in line with earlier studies of hip surgery patients, which report much higher numbers [3, 4, 7]. As seen in another study focusing on data accuracy in medical records [23], our numbers might be underestimated and could be explained by vague documentation. Another likely explanation is the fact that our review only focused on discharge documentation, although patients may have experienced UR during their hospital stay.

High self-reported occurrence of lower urinary tract symptoms after hip surgery, and patients' experiences of living with these symptoms have been recognized earlier [3, 24]. Still, the results of our self-reported survey revealed much higher numbers mainly in the acute group of patients. This could reflect that this group of patients more often have increased ASA classification and comorbidities compared to those having elective surgery, as these factors increases with age [25]. Few patients reported having initiated further contact with their orthopaedic unit due to their postoperative voiding issues, regardless of why they had a hip surgery. This reflects a qualitative report, [24] illustrating insufficient transfer of information from healthcare professionals to the patients on what to pay attention to and why, including what actions to take when confronting a postoperative complication such as incontinence. Potentially, healthcare professionals lack knowledge themselves [11], meaning that clinicians are failing to inform patients about the connection between hip surgery and, for

example, UR, or other voiding issues. Sparse communication with patients on these issues, together with insufficient knowledge and routines, have been described as factors that may contribute to bladder damage caused by distension [26].

Performed risk assessment was associated with acute surgery, and this could indicate healthcare professionals' awareness of increased frailty in this group. However, both elective and acute hip surgery patients are at high risk of developing UR [13], and should be assessed equally according to guidelines [10]. In this study, a performed risk assessment was also associated with being cared for in an academic hospital, potentially explained by a higher awareness of evidence-based guidelines.

Implications for policy, practice, and research

The implementation of the EBP guidelines seems slow and varying, despite their accessibility. Rather, a number of elements pose potential barriers to staff adherence, including varying definitions of postoperative UR, and a lack of international consensus of bladder volume management and catheterization protocols and thresholds [22, 27]. Still, additional guideline implementation is needed for increased patient safety and quality of care; the implementation strategies need to address the complexity of both evidence and context [28] to avoid preventable care injuries posing short- and long-term negative effects on patients' quality of life [26, 29]. A starting point is knowing just how far from optimal care current practice is. Our findings identifies significant room for improvement, requiring that healthcare professionals adapt and change less effective habits and behaviours associated with current clinical routines [30]. Guideline adherence in clinical practice is extremely important for the prevention of UR [12].

Conclusions

In this study, documentation showed a lack of adherence to risk assessment for UR in patients undergoing hip surgery, according to EBP guidelines for bladder monitoring. This supposedly negatively affects quality of care and patient safety. Our result indicates the need for additional efforts to implement these guidelines. Further, they call for an increased understanding of barriers and enablers for performing risk assessment in orthopaedic care, in order to aid suitable implementation strategies for clinical practice.

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Author contributions

Madeleine Winberg (Study Design, Data Collection, Data Analysis, Manuscript Preparation), Eva Joelsson-Alm (Study Design, Data Analysis, Manuscript Preparation), Maria Hälleberg Nyman (Study Design, Data Collection, Manuscript Preparation), Ann Catrine Eldh (Study Design, Manuscript Preparation), Erika Fjordkvist (Study Design, Data Collection, Manuscript Preparation). All authors have read and approved the final manuscript.

Supplementary data

Supplementary data is available at *IJQHC* online.

Conflict of interest

The authors have no conflicts of interest to declare.

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Data availability

The data that support the findings of this study are not openly available but are available from the corresponding author on reasonable request. Data are located in controlled access data storage at Linköping University, Sweden.

References

1. Odén A, McCloskey EV, Johansson H *et al*. Assessing the impact of osteoporosis on the burden of hip fractures. *Calcif Tissue Int* 2013;**92**:42–9. https://doi.org/10.1007/s00223-012-9666-6
2. Brouwer TA, Van Roon EN, Rosier PFWM *et al*. Postoperative urinary retention: risk factors, bladder filling rate and time to catheterization: an observational study as part of a randomized controlled trial. *Perioper Med* 2021;**10**:1–11. https://doi.org/10.1186/s13741-020-00167-z
3. Cialic R, Shvedov V, Lerman Y. Risk factors for urinary retention following surgical repair of hip fracture in female patients. *Geriatr Orthop Surg Rehabil* 2017;**8**:39–43. https://doi.org/10.1177/2151458516683507
4. Baldini G, Bagry H, Aprikian A *et al*. Postoperative urinary retention: anesthetic and perioperative considerations. *Anesthesiol* 2009;**110**:1139–57. https://doi.org/10.1097/ALN.0b013e31819f7aea
5. Darrah DM, Griebling TL, Silverstein JH. Postoperative urinary retention. *Anesthesiol Clin* 2009;**27**:465–84. https://doi.org/10.1016/j.anclin.2009.07.010
6. Balderi T, Carli F. Urinary retention after total hip and knee arthroplasty. *Minerva Anestesiol* 2010;**76**:120–30.
7. Lawrie CM, Ong AC, Hernandez VH *et al*. Incidence and risk factors for postoperative urinary retention in total hip arthroplasty performed under spinal anesthesia. *J Arthroplasty* 2017;**32**:3748–51. https://doi.org/10.1016/j.arth.2017.07.009
8. Peel TN, Cheng AC, Liew D *et al*. Direct hospital cost determinants following hip and knee arthroplasty. *Arthritis Care Res* 2015;**67**:782–90. https://doi.org/10.1002/acr.22523
9. Johansson RM, Malmvall BE, Andersson-Gäre B *et al*. Guidelines for preventing urinary retention and bladder damage during hospital care. *J Clin Nurs* 2013;**22**:347–55. https://doi.org/10.1111/j.1365-2702.2012.04229.x
10. Joelsson-Alm E, Thulin H. *Blåsövervakning vid sjukhusvård. [Bladder monitoring during hospital care]*. 2021. https://www.vardhandboken.se/vard-och-behandling/basal-och-preventiv-omvardnad/blasovervakning-vid-sjukhusvard/ (2 Feburary 2023, date last accessed).
11. Hälleberg Nyman M, Forsman H, Ostaszkiewicz J *et al*. Urinary incontinence and its management in patients aged 65 and older in orthopaedic care - what nursing and rehabilitation staff know and do. *J Clin Nurs* 2017;**26**:3345–53. https://doi.org/10.1111/jocn.13686

12. Magaldi RJ, Strecker SE, Nissen CW *et al*. Preoperative factors to assess risk for postoperative urinary retention in total joint arthroplasty: a retrospective analysis. *Arthroplast Today* 2022;**13**:181–7. https://doi.org/10.1016/j.artd.2021.10.009
13. Zelmanovich A, Fromer DL. Urinary retention after orthopedic surgery: identification of risk factors and management. *J Clin Exp Orthop* 2018;**04**:54. https://doi.org/10.4172/2471-8416.100054
14. Rutberg H, Borgstedt-Risberg M, Gustafson P *et al*. Adverse events in orthopedic care identified via the Global Trigger Tool in Sweden – implications on preventable prolonged hospitalizations. *Patient Saf Surg* 2016;**10**:1–9. https://doi.org/10.1186/s13037-016-0112-y
15. Agrawal K, Majhi S, Garg R. Post-operative urinary retention: review of literature. *World J Anesthesiol* 2019;**8**:1–12. https://doi.org/10.5313/wja.v8.i1.1
16. Elm EV, Altman DG, Egger M *et al*. Strengthening the reporting of observational studies in epidemiology (STROBE) statement: guidelines for reporting observational studies. *BMJ* 2007;**335**:806–8. https://doi.org/10.1136/bmj.39335.541782.AD
17. Eldh AC, Joelsson-Alm E, Wretenberg P *et al*. Onset PrevenTIon of urinary retention in Orthopaedic Nursing and rehabilitation, OPTION-a study protocol for a randomised trial by a multiprofessional facilitator team and their first-line managers' implementation strategy. *Implement Sci* 2021;**16**:65. https://doi.org/10.1186/s13012-021-01135-x
18. Holmström B, Enlund G, Spetz P *et al*. The Swedish perioperative register: description, validation of data mapping and utility. *Acta Anaesthesiol Scand* 2023;**67**:233–9. https://doi.org/10.1111/aas.14174
19. Mayhew D, Mendonca V, Murthy B. A review of ASA physical status–historical perspectives and modern developments. *Anaesthesia* 2019;**74**:373–9. https://doi.org/10.1111/anae.14569
20. Andersson A-C, Johansson R-M, Elg M *et al*. Using quality improvement methods to implement guidelines to decrease the proportion of urinary retention in orthopaedic care. *Int Arch Nurs Health Care* 2017;**3**. https://doi.org/10.23937/2469-5823/1510065
21. Harris K, Søfteland E, Moi AL *et al*. Patients' and healthcare workers' recommendations for a surgical patient safety checklist - a qualitative study. *BMC Health Serv Res* 2020;**20**:43. https://doi.org/10.1186/s12913-020-4888-1
22. Meddings J, Skolarus TA, Fowler KE *et al*. Michigan Appropriate Perioperative (MAP) criteria for urinary catheter use in common general and orthopaedic surgeries: results obtained using the RAND/UCLA Appropriateness Method. *BMJ Qual Saf* 2019;**28**:56–66. https://doi.org/10.1136/bmjqs-2018-008025
23. Förberg U, Johansson E, Ygge BM *et al*. Accuracy in documentation of peripheral venous catheters in paediatric care: an intervention study in electronic patient records. *J Clin Nurs* 2012;**21**:1339–44. https://doi.org/10.1111/j.1365-2702.2011.03949.x
24. Winberg M, Nyman MH, Fjordkvist E *et al*. Patients' experiences of urinary retention and bladder care–A qualitative study in orthopaedic care. *Int J Orthop Trauma Nurs* 2023;**50**:101034. https://doi.org/10.1016/j.ijotn.2023.101034
25. Sung KH, Lee KM, Chung CY *et al*. What are the risk factors associated with urinary retention after orthopaedic surgery? *BioMed Res Int* 2015;**2015**:1–5. https://doi.org/10.1155/2015/613216
26. Joelsson-Alm E, Nyman CR, Svensén C *et al*. Micturition problems after bladder distension during hospitalization in Sweden: "I'm not ill, just damaged for the rest of my life". *Nurs Res* 2014;**63**:418–25. https://doi.org/10.1097/NNR.0000000000000057
27. Scholten R, Kremers K, Van De Groes SAW *et al*. Incidence and risk factors of postoperative urinary retention and bladder catheterization in patients undergoing fast-track total joint arthroplasty: a prospective observational study on 371 patients. *J Arthroplasty* 2018;**33**:1546–51. https://doi.org/10.1016/j.arth.2017.12.001
28. Nilsen P, Bernhardsson S. Context. In: Nilsen P and Birken SA (eds), *Handbook on Implementation Science*. Northampton, MA, USA: Edward Elgar Publishing, 2020.
29. Coyne KS, Wein AJ, Tubaro A *et al*. The burden of lower urinary tract symptoms: evaluating the effect of LUTS on health-related quality of life, anxiety and depression: EpiLUTS. *BJU Int* 2009;**103**:4–11. https://doi.org/10.1111/j.1464-410X.2009.08371.x
30. Potthoff S, Rasul O, Sniehotta FF *et al*. The relationship between habit and healthcare professional behaviour in clinical practice: a systematic review and meta-analysis. *Health Psychol Rev* 2019;**13**:73–90. https://doi.org/10.1080/17437199.2018.1547119

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