(Re)defining nurse and patient roles in routine postoperative neurosurgical care: empowering autonomy and strengthening collaborative roles

Nollen, J.M.

Chapter 9
English summary

The primary objective of this thesis is to redefine the roles of nurses and patients in routine postoperative neurosurgical care, focusing on empowering autonomy and enhancing collaborative roles. This research is particularly relevant for patients undergoing transsphenoidal pituitary surgery, with some attention to those undergoing spondylodesis surgery. The central themes include urine monitoring, indwelling and intermittent urinary catheters and specific gravity measurements, aiming to improve patient outcomes and healthcare efficiency.

Chapter 2 focuses on exploring the complex decision-making processes behind the removal of indwelling urinary catheters (IDUCs) after transsphenoidal pituitary surgery. Through qualitative interviews with healthcare professionals (HCPs), this chapter delves into the factors influencing these critical decisions. HCPs emphasize the importance of accurate fluid balance monitoring in the immediate postoperative period to manage the risk of postoperative Arginine Vasopressin Disorder (AVP-D). IDUCs facilitate this by providing precise measurements of urine output, but the risks associated with prolonged use, such as urinary tract infections (UTIs), must be balanced against their benefits.

Prolonged use of IDUCs can significantly increase the risk of UTIs, leading to extended hospital stays, increased healthcare costs, and additional patient morbidity. HCPs also highlight the impact of IDUCs on patient mobility and comfort. The presence of an IDUC can restrict patient movement and cause discomfort, hindering recovery. Early removal of the catheter is often desired by patients to enhance their postoperative recovery experience, but this must be weighed against the necessity of accurate urine output monitoring. Nurses play a crucial role in postoperative care, and their workload and ability to manage alternative methods of monitoring urine output are important considerations in the decision to remove an IDUC. This chapter emphasizes the need for evidence-based guidelines to support HCPs in making informed decisions about IDUC removal, advocating for a balanced approach that considers patient safety, comfort, and the efficiency of postoperative care.

Building on the insights from healthcare professionals, **Chapter 3** presents a qualitative study capturing patient perspectives on the use of indwelling urinary catheters and the management of fluid balances after transsphenoidal pituitary surgery. This chapter sheds light on the experiences and views of patients, with the goal of enhancing postoperative care. Patients report mixed feelings about catheter use. While some appreciate the necessity of catheters for accurate monitoring and prevention of complications, others express discomfort and a strong desire for early removal. Patients highlight how IDUCs affect their mobility and daily activities, feeling restricted and uncomfortable, which contributes to a desire for early removal to regain independence and comfort. Clear communication with healthcare providers regarding the necessity and duration of catheter use is crucial for patients, who appreciate being involved in the decision-making process and receiving detailed explanations. The feedback underscores the importance of balancing the clinical benefits of IDUCs with the overall postoperative recovery experience, with early removal, when safely feasible, seen as beneficial for enhancing patient satisfaction and comfort.

In **Chapter 4**, the thesis offers a systematic review of the impact of early postoperative indwelling urinary catheter removal. This chapter synthesizes existing research to evaluate the optimal timing for catheter removal and its effects on patient outcomes. Early removal of IDUCs is generally associated with a significant reduction in the incidence of UTIs. Studies included in the review demonstrate that each additional day of catheterization increases the risk of infection, highlighting the benefits of minimizing catheter

duration. Removing IDUCs early in the postoperative period contributes to improved patient mobility and faster recovery, allowing patients to move more freely without the constraints of a catheter. Enhanced patient comfort is another benefit of early catheter removal, as patients often report feeling more comfortable and less restricted once the catheter is removed. The review identifies the need to balance the benefits of early catheter removal with the potential risks of premature removal, such as urinary retention. It emphasizes the importance of individualized patient assessments and tailored care plans to determine the optimal timing for catheter removal, underscoring the potential benefits of early IDUC removal and calling for further research to solidify these practices in neurosurgical care.

The subsequent chapters shift focus towards strategies aimed at improving perioperative care and reducing complications associated with urinary catheter use in both pituitary and spondylodesis surgeries. Chapter 5 outlines a mixed-methods multicentre study protocol for the de-implementation of urinary catheters during surgery and on the ward. This chapter aims to assess how reducing catheter use impacts patient outcomes, contributing to safer and more effective perioperative care. The study involves multiple centers and combines quantitative and qualitative methods to assess the impact of de-implementation strategies on patient outcomes. By reducing the duration of catheter use, the study aims to lower the incidence of catheter-associated complications such as UTIs and enhance patient comfort and mobility.

The study targets neurosurgical patients who are candidates for reduced catheter use. Inclusion and exclusion criteria are defined to ensure the selection of appropriate participants for the intervention. Data collection methods include a combination of quantitative data collection (e.g., infection rates, catheter duration) and qualitative methods (e.g., interviews with HCPs and patients) to gather comprehensive insights into the effects of the de-implementation strategies. The intervention involves implementing evidence-based protocols to minimize catheter use, such as criteria for catheter placement and removal, staff education, and patient engagement initiatives. The study evaluates a range of outcome measures, including the incidence of UTIs, patient mobility, comfort, and overall satisfaction with care. It also examines the impact on nursing workload and the feasibility of the intervention across different centers.

Chapter 6 discusses the implementation of a standardized protocol, as described in **Chapter 5**, for urinary catheter placement in a multicentre before-and-after study. This chapter evaluates the safety, feasibility, and outcomes of this protocol, aiming to improve postoperative care and reduce unnecessary catheterizations. The study involved 2,711 patients, with 2,167 in the pre-intervention group and 544 in the post-intervention group. The implementation of the protocol increased the percentage of patients without inappropriate indwelling catheterization from 46% to 57%. Additionally, the proportion of patients without inappropriate clean intermittent catheterization (CIC) increased from 34% to 67%. Overall catheter use decreased, with patients not receiving an indwelling catheter rising from 54% to 64%, and those without clean intermittent catheterization increased from 89% to 92%. These improvements were statistically significant, confirming the effectiveness of the standardized protocol in reducing inappropriate catheter use and associated complications.

The ordinal logistic regression analysis showed that the intervention had a statistically significant effect on reducing inappropriate catheter use. The odds of having inappropri-

ate catheter use were significantly lower in the post-intervention group compared to the pre-intervention group, with an odds ratio of 0.65 (95% CI: 0.52-0.81) for IDUCs and 0.48 (95% CI: 0.35-0.65) for CICs. Infection rates showed a slight decrease, dropping from 1.4% to 1.3%, and the average length of hospital stay increased marginally from 4.9 days to 5.1 days. This chapter underscores the importance of implementing evidence-based protocols to improve patient outcomes and enhance the efficiency of postoperative care.

Finally, the dissertation addresses the importance of patient empowerment and participation in managing postoperative complications. Chapter 7 focuses on enhancing patient involvement by simplifying the measurement of specific gravity (SG) after transsphenoidal pituitary surgery. This simplification aims to empower patients to actively monitor their SG levels, which is crucial for early detection of AVP-D, a complication indicated by an SG value below 1005 g/l. This chapter underscores the significance of patient participation in working together with nurses to prevent complications. The study included 110 patients who performed a total of 609 specific gravity measurements using Combur-10® urine test strips and the ATAGO MASTER-SUR/Nα refractometer. Moderate agreement was observed between specific gravity measurements by patients using test strips and refractometer readings, with a Kappa value of 0.47 and an ICC of 0.69. Substantial to good agreement was found between patient and nurse specific gravity measurements when both used urine test strips, with a Kappa value of 0.82 and an ICC of 0.89. Additionally, moderate to good agreement was found between nurse measurements using test strips and the refractometer, with a Kappa value of 0.55 and an ICC of 0.77. A SG threshold of 1.015 g/l for urine test strip measurements was chosen to ensure that no corresponding refractometer results fell below 1.005 g/l, which is critical for diagnosing hypotonic urine. This approach meant that in 57.5% of cases, nurse re-measurement was unnecessary, significantly reducing the workload for nurses and highlighting the effectiveness and reliability of patient-conducted specific gravity measurements.

Patient satisfaction was high, with an average score of 7.8, while nurse satisfaction was lower, at 6.4. Patients expressed confidence in their ability to perform and interpret the measurements, and they valued the sense of empowerment and involvement in their care. Nurses reported that patient involvement helped alleviate their workload and allowed for more efficient use of time and resources.

Conclusion

This thesis aims to optimize nursing policies after transsphenoidal pituitary and spondylodesis surgeries to reduce postoperative complications and empower both nurses and patients to take more active and collaborative roles in their care. Through a series of studies and reviews, the dissertation provides valuable insights into the factors influencing urinary catheter management decisions, patient experiences, and the effectiveness of strategies aimed at improving postoperative care. By addressing these critical aspects, the research contributes to ongoing efforts to enhance the roles of nurses and patients in healthcare, ultimately improving the quality of care and patient outcomes in neurosurgical settings. The findings underscore the importance of evidence-based guidelines, patient and nurse empowerment, and collaborative approaches in enhancing postoperative care. Implementing standardized protocols and involving patients in their care processes can significantly improve outcomes, reduce complications, and enhance patient satisfaction. This thesis provides a comprehensive framework for optimizing postoperative care in neurosurgical settings, paving the way for future research and practice improvements.