



Research Report

Standardization of caregiver and nursing perioperative care on gynecologic oncology wards in a resource-limited setting

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ABSTRACT

Introduction: In Kampala, Uganda, there is a strong cultural practice for patients to have designated caregivers for the duration of hospitalization. At the same time, nursing support is limited. This quality improvement project aimed to standardize caregiver and nursing perioperative care on the gynecologic oncology wards at the Uganda Cancer Institute and Mulago Specialised Women and Neonatal Hospital.

Methods: We developed, implemented, and evaluated a multidisciplinary intervention involving standardization of nursing care, patient education, and family member integration from October 2019 – July 2020. Data were abstracted from medical records and patient interviews pertaining to the following outcomes: 1) pain control; 2) post-operative surgical site infections, urinary tract infections, and pneumonia; 3) nursing documentation of medication administration, pain quality, and vital sign assessments, and 4) patient and caregiver education. Descriptive statistics, Fisher's exact test, and independent samples *t*-test were applied.

Results: Data were collected from 25 patients undergoing major gynecologic procedures. Pre- (N = 14) and post- (N = 11) intervention comparison demonstrated significant increases in preoperative patient education (0% to 80%, $p = 0.001$) and utilization of a comprehensive postoperative order form (0% to 45.5%, $p = 0.009$). Increased frequency in nursing documentation of patient checks (3 to 8, $p = 0.266$) and intraoperative antibiotic administration (9 to 10, $p = 0.180$) in patient charts did not reach significance. There was no change in infection rate, pain score utilization, caregiver documentation, or preoperative medication acquisition.

Conclusion: Our findings suggest that patient- and family-centered perioperative care can be improved through standardization of nursing care, improved education, and integration of caregivers in a nursing-limited setting.

1. Introduction

The Uganda Cancer Institute (UCI) and Mulago Specialised Women and Neonatal Hospital (MSWNH) in Kampala, Uganda provide gynecologic oncology care for women throughout East Africa. At the same time, many gaps in care exist. There is limited nursing support for patients; in 2018, the World Bank estimated 1.238 nurses and midwives per 1,000 people in Uganda (World Bank, 2018). The Ministry of Health in Uganda has estimated the mean availability of common antibiotics to be 51–68%

and the percentage of hospitals with morphine available to be 18% (Uganda Ministry of Health, 2014). As a result, there is a strong cultural practice for most patients to have a designated caregiver who stays with the patient for the duration of hospitalization. Caregivers are typically family members or attendants who have no medical training, and they are responsible for monitoring patients, communicating with the provider care team, providing food and drink, emptying urine, bathing or cleansing the patient, transporting surgical specimens to pathology, and arranging follow-up appointments. Caregivers may also need to

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purchase medications not available in the hospital from an outside pharmacy. Given the current level of engagement, there is an opportunity to improve care through the integration of family members as care providers.

Patient- and family-centered care (PFCC) is known to improve healthcare quality across various settings and patient populations and has been studied primarily in high-income settings (Park et al., 2018). While definitions of PFCC vary widely, its core aspects include patient involvement in care, patient information, clinician-patient communications, and patient empowerment (Park et al., 2018). At its core, PFCC relies on mutual power-sharing relationships between patients, family members, and healthcare providers. Interventions typically included physical support, empowerment, and patient information and education. Several systematic reviews of PFCC interventions have demonstrated positive outcomes for patients (knowledge about their health, skills to perform self-care behaviors, enhanced satisfaction with providers, increased quality of life, and reduced admissions, readmissions, and length of hospital stays), family members (reduced stress, anxiety, and depression, increased satisfaction, and improved relationships with providers), and healthcare providers (higher job satisfaction, confidence in their work, improved quality of care, and reduced stress and burnout) (Park et al., 2018).

A few health systems have studied novel programs that specifically involve family members in post-surgical patient care (Eskes et al., 2019; Van De Graaff et al., 2018). The post-operative environment is unique in that outcomes heavily rely on delivery of fundamental care (e.g., eating, dressing, washing, and mobilizing) that is typically delivered by nursing staff in other countries. Surgical complications such as pneumonia and urinary tract infections may be preventable and are dependent on adequate fundamental care (Eskes et al., 2019). Recruitment of family members as caregivers represents an opportunity for collaborative care in these settings. These previous studies demonstrated that family member involvement in care improved outcomes, including a significantly reduced 30-day readmission rate (Van De Graaff et al., 2018).

At UCI and MSWNH, PFCC interventions have not been formally incorporated, nor have data been collected on post-operative outcomes for patients. However, a prior study at Mulago National Referral Hospital in Kampala, Uganda demonstrated that caregiver education was the most effective intervention that helped improve medication adherence from 46.5% to 92% (Alupo et al., 2017). This report outlines an initiative designed to further integrate patients' caregivers as clinical care partners and standardize nursing care during the perioperative period. Our goal was to improve the quality and patient-centeredness of healthcare delivery in these settings.

2. Methods

We received Institutional Review Board (IRB) exemption for this quality improvement (QI) project that was conducted in two hospitals in Kampala, Uganda between October 1, 2019 and July 15, 2020. The setting included two inpatient surgical wards and one outpatient clinic, all of which provide pre- and post-surgical care for patients with gynecologic oncology malignancies. The providers included 22 nursing staff and 7 gynecologic oncology physicians. The multi-faceted design included the following phases: 1) pre-implementation, 2) implementation, and 3) post-implementation.

2.1. Phase 1: Pre-implementation

Development of the project began with stakeholder involvement. With the proposed novel idea of caregiver integration as the primary goal, hospital administration, nursing leadership, and gynecologic oncology attendings and fellows voiced support for the project. The first outline of the project was designed in collaboration with the senior gynecologic oncology fellows. The initial outcomes of interest included the following: 1) pain control, measured with pain scores on

postoperative (PO) day 1 and pain medication administration; 2) infection rates, defined as the occurrence of any surgical site infection, urinary tract infection, or pneumonia during hospitalization until day of discharge; and 3) nursing documentation of medication administration, vital signs, and ins/outs in patient charts.

The DMAIC (Define, Measure, Analyze, Improve, Control) quality improvement process and methodology were applied (Ahmed, 2019). Baseline data were obtained to evaluate the need for and feasibility of an intervention. Data were obtained from chart review and patient and caregiver interviews to determine gaps in care and opportunities for intervention. The core QI team comprised of two gynecologic oncology fellows, a gynecologic oncology physician assistant, and a medical student who spoke with the nurses who interface with gynecologic oncology patients to understand what they felt was feasible, what gaps existed, and what would be the most helpful to them. They agreed that caregiver involvement in perioperative care could facilitate completion of nursing tasks. They additionally felt there was a need to standardize nursing care and improve communication from the fellows on post-operative orders (e.g., standardization of prescribed pain regimens). The fellows, who perform all hospital care, reiterated the need for standardization of nursing care and improved communication, particularly with adherence to post-operative orders.

The QI program was drafted by JW, JA, and PL, who utilized existing protocols at the authors' academic tertiary care institution in the United States as a reference for creating a nursing manual. The QI team tailored the intervention to suit the setting and needs of the physicians and the nurses in Uganda. Feedback from two fellows (MN and PM) and one attending physician (AO) at UCI were incorporated. Next, focus group meetings were held for 22 inpatient, outpatient, and operating theater nurses who interface with gynecologic oncology patients at UCI, MSWNH, and the Jinja Regional Referral Hospital (JRRH), a rural community hospital in Uganda. The program was redrafted to incorporate the feedback and suggestions received in these sessions and ultimately included the components in Table 1.

A training manual with checklists for the clinic, pre-operative inpatient period, and post-operative inpatient period was developed

Table 1
Participants and actions of the program.

Participant	Tasks	Gaps addressed
Outpatient clinic nurses	<ul style="list-style-type: none"> • Provide patient instructions and educational handouts • Review key education points with patient 	<ul style="list-style-type: none"> • Patient education on expectations and preparation for surgery • Counseling on pathology and treatment planning
Inpatient ward nurses	<ul style="list-style-type: none"> • Follow the outlined checklist and review standard operating procedures • Review key educational points with patient before and after surgery • Coach patient's family members through their involvement during hospitalization • Train fellow nurses on the intervention • Utilize centralized documentation flowsheet • Provide detailed discharge instructions and handout 	<ul style="list-style-type: none"> • Nursing documentation in patient charts • Standardized care, including pain medication and antibiotic administration and specific post-operative orders • Patient education • Family member participation • Utilization of pain scores • Improved follow-up after discharge
Patient family member	<ul style="list-style-type: none"> • Follow checklist to participate in care during hospitalization • Document patient care activities on flowsheet 	<ul style="list-style-type: none"> • Family member participation • Nursing documentation in patient charts
Physicians	<ul style="list-style-type: none"> • Ensure nursing participation • Complete the centralized post-operative orders sheet 	<ul style="list-style-type: none"> • Standardization of post-operative orders and communication with nursing staff

(Appendix A). A nursing flowsheet was also created to centralize documentation in the medical chart (Appendix B). For the caregiver intervention, flowsheets were created on reusable laminated materials for family members to document various pieces of information using dry-erase markers (Appendix C). Specific intervention activities for family member involvement were developed using evidence-based guidelines and tailored to the setting (Table 2) (Pasquina et al., 2006; Nelson et al., 2019; Guo et al., 2019; Scheib et al., 2019; Bisch et al., 2019; Charoenkwan and Matovinovic, 2014; Hawker et al., 2017). A standardized post-operative order set for the physicians was also created, with information on what aspects would be required obtained from attendings and fellows (Appendix D). Finally, educational handouts containing information on the surgery, expectations, and care instructions, in addition to a translation to Luganda, the local language, were created (Appendix E).

2.2. Phase 2: Implementation

The pre- and post-op educational handouts and intervention components targeted all points of contact. This included checklists for the nurses and the patients. On the wards, laminated pain scales and flowsheets for caregivers to record the various metrics above were provided. The intervention utilized dry-erase markers to mark on the laminated flowsheets.

The developed materials were taught to the 22 gynecologic oncology nurses from UCI, MSWNH, and JRRH. Trainings were conducted through an in-person didactic classroom setting as well as on an individual basis on the wards and in the clinic. Nurses accepted the

Table 2
Fundamental care activities targeted for family member involvement.

Fundamental care activity	Evidence-based guideline	Postoperative outcome
Coughing and deep breathing; Elevated head-of-bed	Forced deep breathing and coughing exercises; postural drainage after surgery	Prevention of pneumonia and other pulmonary complications (Pasquina et al., 2006)
Walking; Leg checks	Early mobilization within 24 h of surgery (Nelson et al., 2019)	Decreased risk of intravascular/venous thrombosis (Guo et al., 2019) Decreased fatigue and muscle loss (Scheib et al., 2019)
Eating and drinking	Post-operative nutrition should be started immediately after surgery (within the first 24 h) and can be advanced rapidly (Nelson et al., 2019; Bisch et al., 2019)	Faster recovery of bowel function, lower rates of infectious complications, shorter hospital stay, and higher satisfaction (Charoenkwan and Matovinovic, 2014) Avoidance of ileus, prevention of post-operative nausea/vomiting, reduced catabolism (Scheib et al., 2019)
Personal cleansing and dressing; Dressing checks; Early purchasing of medications	Antimicrobial prophylaxis (Scheib et al., 2019); Surgical site assessment (Hawker et al., 2017)	Prevention of surgical site infections and infectious complications, improved length of recovery (Nelson et al., 2019; Scheib et al., 2019)
Urine output monitoring	Monitor and record urine output (Hawker et al., 2017)	Detection of urinary tract infection or urinary tract injury
Pain monitoring; Early purchasing of medications	Multimodal analgesia (Scheib et al., 2019)	Improved pain control, mobilization, post-operative nausea/vomiting, and overall recovery; decreased catabolism (Scheib et al., 2019)

responsibility to train caregivers as part of the patient intake process, as outlined in the inpatient pre-operative checklist. Nurses who were more involved and vocal about these process changes were recruited to become nursing champions, who were designated to train the other nurses on the tasks of the intervention. Fellows were trained in utilizing the post-operative order set, and one fellow was designated as a point-person for the physician side of the intervention.

2.3. Phase 3: Post-implementation

A planned round of feedback, program improvement, and data collection was cancelled due to a shutdown of operations and travel in the setting of COVID-19. A virtual post-implementation process included biweekly virtual check-ins with the 6 designated nursing champions and fellows to troubleshoot issues and obtain feedback on program utilization. A gynecologic oncology fellow (PM) conducted retrospective chart review and phone interviews using standardized qualitative questionnaires post-discharge with patients who underwent major gynecologic surgeries three months after the implementation of the intervention (Appendix F). Analysis of the data was performed on IBM SPSS Statistics for Mac OS version 28.0 using descriptive statistics and Fisher’s exact test (two-sided), with p values less than 0.05 considered significant.

3. Results

During the pre-implementation assessment period of September 2019, 14 major procedures via laparotomy were performed with a median length of hospital stay of 3 days [range 3–12]. Pre- and post-operative interviews were completed in-person with 9/14 patients undergoing surgery. During the post-implementation phase, 11 patients underwent major gynecologic surgery at UCI and MSWNH; patient interviews were completed with 10 patients after discharge by telephone. Due to the low volume of surgical patients in the setting of a country-wide shutdown of services due to COVID-19, post-intervention cases were evaluated from the period of March through July 2020. Data from non-respondent patients were excluded from analyses.

Of the 11 patients to be interviewed in the post-implementation phase, one interview could not be completed due to lack of contact information. Data from this one participant were excluded from post-intervention analysis. In addition, 1/10 had purchased medications prior to surgery, which was not a significant increase from pre-intervention (p = 0.582) (Table 3). All patients had documented pain medication administration after surgery, unchanged from prior. However, there were significant increases in the post-intervention number of patients who reported having received education on wound care (0% to 80%, p = 0.001) and postoperative expectations (0% to 60%, p = 0.011). None of the patients had a postoperative infection by day of discharge, and this was unchanged from pre-intervention.

In terms of documentation, there was a significant increase in utilization of the new physician post-operative order set (0% to 45.5%, p = 0.009). Median number of documented nursing checks improved from 3 to 5 (p = 0.266), and documentation of intraoperative antibiotic administration increased from 64.3% to 90.9% (p = 0.180); these did not reach significance. The following measures were unchanged from prior: documentation of pain medication on POD 0 and POD 1 (92.9% to 100%, p = 1.00), documentation of the presence of pain and any descriptors on POD 1 (35.7% to 36.4%, p = 0.266), and documentation of pain scores (0% to 0%, p not applicable).

Caregiver documentation on flowsheets also did not occur at the time of post-intervention data collection. While this may represent 0% compliance with caregiver documentation on laminated flowsheets, it is unclear whether this was not able to be captured due to the impermanence of documentation with dry erase markers. After the data collection period, a nursing champion reported the following: in a cohort of 12 patient caregivers invited to participate, 9 agreed to document on the flowsheet and help monitor patients for the designated signs; 2 of the

Table 3
Comparison of pre- and post-intervention outcome measures.

	Pre-intervention, n (%)	Post-intervention, n (%)	p value
Pre-operative measures	N = 9	N = 10	
Patient or family purchased pain medications before surgery	0 (0%)	1 (10%)	0.582
Purchased antibiotics before surgery	1 (11.1%)	0 (0%)	–
Received wound care education	0 (0%)	8 (80%)	0.001
Received education on what to expect after surgery	0 (0%)	6 (60%)	0.011
Post-operative measures	N = 9	N = 10	
Family member/caregiver documenting on the caregiver flowsheet on POD1	0 (0%)	0 (0%)	–
Presence of post-op infection by day of discharge	0 (0%)	0 (0%)	–
Documentation in the chart	N = 14	N = 11	
Number of documented nursing checks by POD1 (in 24 h), median (range)	3 (1–8)	5 (1–8)	0.266
Documentation of pain quality by POD1	5 (35.7%)	4 (36.4%)	0.689
Documentation of pain score at least once by POD1	0 (0%)	0 (0%)	–
Documentation of pain medication administration on POD0 and POD1	13 (92.9%)	11 (100%)	1.00
Documentation of intraoperative antibiotic administration	9 (64.3%)	10 (90.9%)	0.180
Documentation on new post-op order sheet	0 (0%)	5 (45.5%)	0.009

other caregivers preferred to report directly to nurses, and 1 was elderly and felt the patient could report symptoms herself. During post-implementation check-ins, the nursing champions reported that the nursing checklists and flowsheets in the chart were useful and that the attendant flow sheets were easy to teach and use.

4. Discussion

This is the first reported development and implementation of a patient- and family-centered care intervention in a low-resource gynecologic oncology surgery setting. The baseline findings of this study demonstrate an opportunity for improvement in several aspects of perioperative care. Standardization of nursing care, particularly patient and family member counseling on expectations of surgery and the need to purchase pain medications and antibiotics, was addressed through the intervention checklists. In the post-implementation period, nurses favored the checklists as highly useful. While post-intervention changes in medication purchasing and documented administration failed to reach significance, patient and family member counseling and education significantly increased.

In terms of medications and documentation, interestingly, pre-operative purchasing of pain medication and antibiotics remained low while documentation of medication administration was high. The standard practice at baseline was for patients' caregivers to purchase pain medication and antibiotics pre-operatively; however, medication availability varied, and, in some cases, patients were able to receive medications without outside purchase dependent upon hospital pharmacy drug availability and were billed postoperatively. The new physician order set and nursing checklists may have helped increase documentation, but it appears that patients received antibiotics and pain medication that may have been purchased on day of surgery or after surgery, which were not captured by our assessments. This may also be explained by changing physician prescription practices based on which medications are available at the hospital pharmacy, allowing patients to avoid purchasing medications outside the hospital. Additionally, pain

scores were not successfully documented during the assessment period. Despite buy-in from the healthcare providers, cultural differences where pain scores in this setting are not consistently used may have contributed to the lack of post-implementation documentation of pain scores in patient charts, making it difficult to determine whether pain control and pain regimens needed changes. Overall, the availability and accessibility to medications frequently varied at the hospitals, and further data on the availability of different pain medications and antibiotics are needed in order to standardize prescription practices, purchasing, and administration.

It was difficult to objectively assess caregiver integration into perioperative care. While one nursing champion reported data of strong utilization of the caregiver integration program, these data could not be verified and were not captured within the post-implementation retrospective telephone surveys. However, the nursing champions continually reported strong participation, stating the checklists and flowsheets were easy to explain and that they support the feasibility of caregiver integration in this setting. Additionally, documentation by caregivers may not be feasible, as they may prefer a verbal partnership for communication with the nursing team. Future training may need to incorporate these adjustments.

Strengths of this project include that it was developed based on stakeholder interest, with buy-in and feedback from nursing staff and physicians on the gynecologic oncology team. Additionally, this work is generalizable to the other surgical floors, and several nurses have expressed interest in expanding the project. The initial training and feedback sessions included training of rural district nurses, who plan to champion the expansion of this QI initiative in those hospitals. Finally, the project focused on sustainability by creating nursing buy-in and utilizing reusable materials. The nursing checklists and education guidelines created in this intervention have now been included in the hospital's Standard Operating Procedures, which help with ensuring high levels of participation among nurses. The nurses report advocating to hospital administrators to make this part of their continuing medical education and a mandatory part of training for all nursing staff.

There are several limitations to this project. The low volume of surgeries, changes in nursing staff, restrictions on patients and visitors, and disruption of the project by the COVID-19 pandemic response contributed to the difficulty of post-implementation assessment. This also includes the cancellation of a planned post-implementation in-person visit by three QI team members (JW, PL and JA) to provide further in-person trainings, audit the program, troubleshoot the interventions, and incorporate feedback to further tailor the intervention to the region. Another challenge to implementation of this intervention is the limited number of nurses at the participating hospitals. Regular engagement of nurses is challenging in this setting; one nurse reported it was difficult to have nurses implement all aspects of the intervention when, at times, there is only one nurse caring for over fifteen patients. Additionally, there is a language barrier as there are 42 living languages in Uganda (Gordon, 2005). There are also differences in literacy and education. Some of this was mediated by nursing champion buy-in and the inclusion of translated education handouts in our intervention, as well as the utilization of photographs where possible. Although desired by nurses and physicians, implementation of these new assessments will likely require more support for nursing champions.

To continue the momentum and progress of this intervention, ongoing direct oversight is likely needed. With restrictions of COVID, the attempt to provide this oversight through video calls is ongoing with the physicians and nurses in Uganda. The goal for next steps in addition to this oversight is expansion to rural community hospitals such as JRRH, where the gynecologic oncology surgical team has recently begun providing care. Further assessment of patient, family member, and healthcare provider perceptions of the intervention and potential challenges would help improve this QI initiative. Suggested next steps include more robust data collection, continued iterations that improve and evolve the intervention, expansion to other surgical wards, and

advocacy to hospital administration for continued PFCC work. Overall, the strategies outlined in this intervention can potentially fill gaps of known nursing human resource shortages in resource-limited settings.

5. Conclusions

This QI project involved the development, implementation, and evaluation of a standardized approach for nursing care and the integration of caregivers in the perioperative setting for gynecologic oncology patients at the main tertiary hospitals in Uganda. Our findings suggest that patient- and family-centered perioperative care can be improved through standardization of nursing care and improved patient and caregiver education in a nursing-limited setting.

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CRedit authorship contribution statement

Janice Wong: Conceptualization, Methodology, Formal analysis, Data curation, Investigation, Writing – original draft. **Pius Mulamira:** Conceptualization, Methodology, Investigation, Writing – review & editing. **Jessica Arizu:** Conceptualization, Methodology, Writing – review & editing. **Mariam Nabwire:** Conceptualization, Methodology, Investigation, Writing – review & editing. **Dorothy Mugabi:** Conceptualization, Investigation, Project administration. **Sarah Nabulime:** Conceptualization, Investigation, Project administration. **Dorine Driwaru:** Conceptualization, Investigation, Project administration. **Esther Nankya:** Conceptualization, Investigation, Project administration. **Ritah Batumba:** Conceptualization, Investigation, Project administration. **Augustin Hagara:** Conceptualization, Investigation, Project administration. **Anthony Okoth:** Conceptualization, Project administration, Supervision. **Jane Lindan Namugga:** Conceptualization, Project administration, Supervision, Writing – review & editing. **Judith Ajeani:** Conceptualization, Project administration, Supervision. **Carolyn Nakisige:** Conceptualization, Project administration, Supervision. **Stefanie M. Ueda:** Supervision. **Laura J. Havrilesky:** Conceptualization, Supervision, Writing – review & editing. **Paula S. Lee:** Conceptualization, Methodology, Supervision, Project administration, Funding acquisition, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

The data underlying this article are available in the article and in its online supplementary material.

Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.gore.2021.100915>.

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