DEVELOPMENT AND EVALUATION OF A NURSE PRACTITIONER-DIRECTED PREOPERATIVE MEDICATION RECONCILIATION AMONGST BARIATRIC SURGERY PATIENTS AT A COMMUNITY HOSPITAL

An Evidence-Based Scholarly Project

Submitted to the College of Health Professions and Natural Sciences

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Doctor of Nursing Practice

Adebola A. Osewa

Wilmington University

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College of Health Professions and Natural Sciences
Doctor of Nursing Practice Program

We hereby approve the Doctor of Nursing Practice project of

Adebola A. Osewa

Candidate for the degree of Doctor of Nursing Practice

Dr. Denise Lyons

_____ _____

Date *DNP Project Advisor Name & Credentials*
DNP Project Advisor

Dr. Fiona Smith

_____ _____

Date *DNP Project Team Member Name & Credentials*
DNP Project Team Member

ACCEPTED

Signature on File

_____ _____

Aaron Sebach, PhD, DNP, MBA, AGACNP-BC,
FNP-BC, CP-C, CEN, CPEN, NREMT, CGNC, CLNC,
CNE, CNEcl, SFHM, FNAP, FAANP
Dean, College of Health Professions and Natural Sciences

Title: Development and Evaluation of a Nurse Practitioner-Directed Preoperative Medication Reconciliation Amongst Bariatric Surgery Patients at a Community Hospital

Author: Adebola A. Osewa

DNP Project Advisor: Dr. Denise Lyons

DNP Project Team Member: Dr. Fiona Smith

The prevalence of morbid obesity in the United States (US) continues to be on an incessant rise and at an epidemic level. Morbid obesity, a serious health problem that can result in adverse health complications, continues to be ignored despite public awareness of its morbidity and mortality. In a recent report by The Centers for Disease Control and Prevention (CDC), 41.9% of adults and 19.7% of children are affected in the US. With no paucity in this epidemic and the goal of a means to curb the trend, bariatric surgery has emerged as the most effective and long-lasting weight loss method now available. However, postoperative medication reconciliation remains a complex facet. This DNP project involved the participation of 28 pre-implementation and 14 post-implementation bariatric surgery patients at a community hospital in New York City. There was a pre-implementation rate of 25%, and complications decreased to 0% post-implementation. These findings for the project outcome were populated through a pre-post intervention descriptive analysis using the Pearson Chi-Square Analysis. This DNP project translated into practice the role and importance of implementing a standardized preoperative medication reconciliation process to reduce postoperative surgical complications and morbidity in adult bariatric patients at a community hospital.

Keywords: ERAS, bariatric surgery, discharge, medication reconciliation, postoperative complications

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ABBREVIATIONS

ADE – Adverse Drug Events

AHRQ – Agency for Healthcare Research and Quality

aMAI- Adapted Medication Appropriateness Index

APN- Advanced Practice Nurses

ASMBS - American Society of Metabolic and Bariatric Surgery

CDC – Centers for Disease Control and Prevention

DNP – Doctor of Nursing Practice

DS- Discharge Summary

DVT – Deep Vein Thrombosis

EHR – Electronic Health Records

HIT – Health Information Technology

IHI – Institute for HealthCare Improvement

IT - Information Technology

LOS – Length of Hospital Stay

MATCH - Medications at Transitions and Clinical Handoffs

MEDREC – Medication Reconciliation

MODHS – Ministry of Defense Health Services

MR – Medication Reconciliation

OTC – Over The Counter

PA – Physician Assistant

PDSA – Plan Do Study Act

PHR – Personal Health Record

PICOT – Population, Intervention, Comparison, Outcome, and Time

PONV – Postoperative Nausea and Vomiting

PST – Presurgical Testing

QI – Quality Improvement

RCT – Randomized Control Trial

RYGB – Roux-En-Y Gastric Bypass

SG- Sleeve Gastrectomy

US – United States

WHO - World Health Organization

CHAPTER ONE

INTRODUCTION

Problem Description

As technological advances promote sedentary lifestyles, meal portion sizes soar to astronomical new levels, and the weight of Americans increases correspondingly. This prevalence becomes glaring that obesity has become an epidemic in the United States US). According to the Centers for Disease Control and Prevention (CDC), 100.1 million (41.9%) adults and 14.7 million (19.7%) children account for approximately $147 billion in annual healthcare costs (CDC, 2023). This epidemic continues to raise political, social, and ethical concerns in America. Despite public awareness of the numerous comorbid risks associated with obesity, the prevalence, morbidity, and mortality remain ignored. An attempt to help curb this unabating epidemic is with bariatric surgery.

Bariatric surgeries are performed for weight loss. They have been performed since the 1960s and are intended to treat obesity and resolve associated comorbidities. The most common options are the sleeve gastrectomy (SG) and the Roux-en-Y gastric bypass (RYGB). The less common options are adjustable gastric band, biliopancreatic diversion with duodenal switch, and single anastomosis duodenal bypass with sleeve gastrectomy (American Society of Metabolic and Bariatric Surgery [ASMBS], 2023).

Bariatric surgery is now easily available to patients who meet eligibility requirements. It has emerged as the most efficient and durable weight loss method (El Ansari & Elhag, 2021). Despite this worldwide rise in weight loss surgeries and the heightened focus on quality care, it is inevitable to deny the evolving information technology (IT) in the healthcare sector where new protocols and electronic healthcare records (EHR) directly impact the ability to improve patient

outcomes while streamlining the delivery of care. However, the intricacies encountered when reconciling medications postoperatively for these patients remain complex. Many factors, such as types of surgery, pharmacokinetics, and pharmacodynamics, lead to medication absorption postop bariatric surgery variations. These variations majorly impact complications. A tailored postoperative therapy regimen utilization and effective medication reconciliation are recommended after bariatric surgery (Alalwan et al., 2022).

Medication reconciliation, a critical aspect of patient care, is a safe strategy or process that ensures accurate and consistent communication of patient medication information across various stages of healthcare delivery, particularly during transitions of care such as post-surgery (Botros & Dunn, 2019). Transitions in care have the potential to create a vacuum for discrepancies in medication reconciliation that, if not properly addressed, may steer grave consequences. Medication discrepancies occur in approximately 80% of hospitalized patients during transitions of care, either at admission or discharge (Penm et al., 2019). Considering the complex comorbid state of bariatric patients, the likelihood of developing major surgical complications such as severe dehydration, anastomotic leaks, bleeding, deep vein thrombosis (DVT), stenosis, and death is increased if failure to plan for the prevention of these complications properly can be quite costly for any healthcare organizations (Gulinac et al., 2023).

After conducting a gap in needs assessment for this project, a deficiency was noted in the medication reconciliation due to the lack of interoperability existing within two EHR systems (Allscripts in the ambulatory setting and Sunrise in the hospital setting) currently used at the project organization. This lack of systems interoperability and a lack of a standardized medication reconciliation process at the project site has led to multiple medication inaccuracies

at discharge within the bariatric surgery population, resulting in postoperative complications and morbidity.

Ineffective medication reconciliation (MR) threatens patient safety across healthcare systems worldwide (Baughman et al., 2021). The National Patient Safety Goal Three of The Joint Commission recommends implementing processes that recognize accurate medication reconciliation. To promote this initiative, the Centers for Medicare and Medicaid Services (CMS) Electronic Health Records (EHRs) offer organizations incentives to encourage the use of interoperable EHR systems (Morse et al., 2021).

In the US alone, between 7,000 - 9,000 die of preventable deaths associated with medication errors per year, which cost the US Health system about $40 billion annually (Tariq et al., 2023). These errors are commonly attributed to failure to adequately communicate medication information at transitions of care, often related to flaws and a lack of standardized reconciliation processes and technological systems.

Practice Before the Project

In this digital era, where the upsurge of Health Information Technology (HIT) such as EHRs play a pivotal role in providing significant clinical benefits in delivering patient-centered and evidenced-based care, barriers and/or failures that hinder their full interoperability exist. Potential patients present to the bariatric surgery clinic for evaluation by the surgeon, and if deemed eligible, process requirements are explained. Once requirements are met, a surgery date is granted, and a pre-surgery testing (PST) appointment in the hospital is scheduled. At the PST appointment, an evaluation is done in collaboration between an advanced practice nurse (APN) and an anesthesiologist, with the core goal being preoperative anesthesia optimization. The patient eventually completes the surgical procedure with a 23-hour postoperative monitoring

before discharge. Physician Assistants (PA)/Nurse Practitioners (NP) order conventional hospital discharge medications on the surgical floor. Conventional discharge is not tailored to meet the postoperative needs of this vulnerable population. Traditionally, a process for adequate medication reconciliation is expected to be standard practice at any healthcare organization. A lack of EHR interoperability within the two systems employed by the site has been identified as the culprit for postoperative complications/morbidity.

Relevance to Nursing Practice

The continuous need for evidence-based care is prevalent in today's healthcare world. It has become an integral part of nursing, and its importance is particularly reflected in the ongoing nursing practice changes. Nurse practitioners must have superior objective skills and be purposeful, reflective, and questionable when making clinical decisions. Implementing this quality improvement (QI) project would be significant to research, education, the body of literature, and nursing practice as it would help nurse practitioners balance relevant evidence-based outcomes on a clinical subject such as bariatric surgery. It would expand the knowledge of NPs who care for bariatric patients and add to the ongoing body of knowledge on patient safety goals.

Rationale

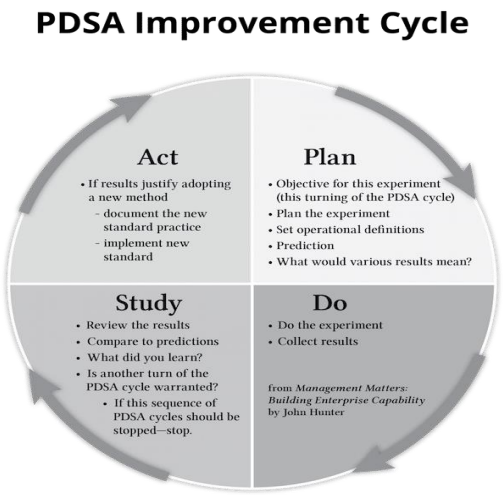
Advanced practice nurses (APNs) are expected to understand the importance of evidence-based practices in care delivery. To enable efficient care delivery, QI projects aid in actualizing an identified process necessitating change. The gap in patient care with a lack of an effective and efficient medication reconciliation process increases the chances of postoperative morbidity in bariatric patients. The goal of this DNP project is to effect a simplified and standardized ERAS-based medication reconciliation process that will eliminate inaccuracies, facilitate proper

communication of discharge postoperative medications, reduce the length of hospital stay (LOS), decrease postoperative complications and morbidity, and ultimately improve patient-related outcomes and healthcare utilization (Zhou et al., 2021).

For any successful project, it is imperative to have a theoretical framework. Frameworks provide guidance and support and justify the problem statement, importance, intention, and premise. After a comprehensive review, the Plan Do Study Act (PDSA) theoretical framework was selected for this Doctoral of Nursing Practice (DNP) QI project. The PDSA theoretical model of change (Figure 1) is a four-step cycle that allows you to implement change, solve problems, and continuously improve processes. Its cyclical nature allows it to be utilized continuously for ongoing improvement. This performance improvement framework allows for continuous improvement by identifying the problem, evaluating the current state of the problem, determining the root cause, and taking appropriate steps to address the problem (Agency for Healthcare Research and Quality [AHRQ], 2023).

Figure 1

The PDSA Improvement Cycle



Adapted from *Management Matters: Building Enterprise Capability* by John Hunter, 2020.

For this DNP project, the independent variable is medication reconciliation, while the dependent variable is decreased complication and morbidity in bariatric surgery patients.

Assumptions

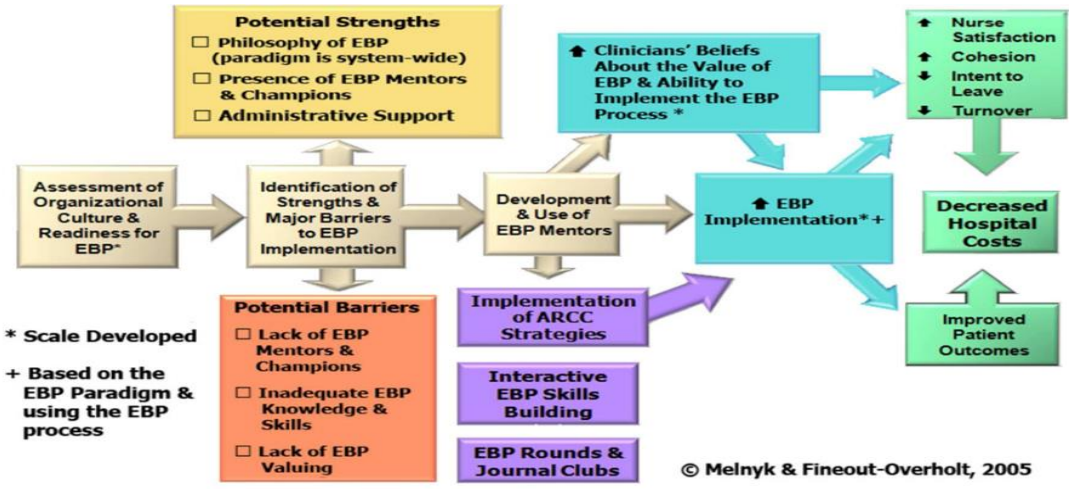
The project assumptions are that medication reconciliation is associated with decreased discrepancies at discharge. The Enhanced Recovery After Surgery (ERAS) protocols enhance postoperative outcomes and decrease complications. ERAS is a multimodal pathway that integrates evidence-based interventions to care for patients during the perioperative phase to reduce stress, decrease surgical complications, and accelerate postoperative recovery (Zhou et al., 2021).

Evidence-Based Practice Model

A contingent of a DNP-prepared nurse is the possession of sophisticated expertise in assessing organizations, identifying system issues, and facilitating system-wide changes to support and provide leadership in promoting safe patient care within healthcare systems and academic settings (American Associations of Colleges of Nursing [AACN], 2006). The Ask, Research, Critique, and Change (ARCC) Evidenced Based Practice (EBP) Model (Figure 2) is a framework used to guide the process of problem-solving and decision-making based on the best available evidence (Melnyk et al., 2021).

Figure 2

The Advancing Research & Clinical Practice with Close Collaboration Model.



Adapted from "A test of the ARCC© model improves implementation of Evidence-Based Practice, healthcare culture, and patient outcomes."

This model provides a systematic and rigorous approach to evidence-based decision-making, which can improve the quality and effectiveness of any project. The ARCC Model uses a seven-step approach designed categorically to meet the demands of practicing nurses. The seven steps are encouraging and supporting a spirit of inquiry, asking questions, searching for evidence, appraising the evidence, integrating evidence into practice, evaluating outcomes, and sharing results.

The spirit of inquiry for this DNP project began with questioning reasons for a failed medication reconciliation in the vulnerable population of bariatric surgery. An assessment was initiated by asking questions from bariatric surgeons and care providers of this vulnerable population. A scholastic search for the best evidence was sought and appraised using the Ohio State Rapid Critical Assessment tool. The quality evidence garnered allowed for integration into

forming the PICOT question for the DNP project. The EBP practice change will be implemented into practice, outcome measures will be evaluated, and results will be disseminated.

Specific Aims

The purpose of this DNP project is to implement an efficient, effective, and standardized medication reconciliation process that would facilitate proper communication of discharge postop medications, how to use medications, and the importance of patient adherence to ultimately prevent postoperative complications and morbidity.

The PICOT question used for this project is: In adult bariatric surgery patients, how does the (P) implementation of a preoperative medication reconciliation process (I) versus no preoperative medication reconciliation (C) affect postoperative discharge complications and morbidity (O) over 6-weeks (T)?

Definition of Terms

For this DNP project, conceptual and operational definitions are as follows.

- *Bariatric Surgery Patient* - defined as project participants with a BMI of 40 or at least 35 in the presence of major weight-related health conditions such as diabetes, high blood pressure, or heart disease who have had a type of metabolic surgery performed for the purpose of weight loss (Gulinac et al., 2023).
- *Bariatric Surgery* – A set of surgical weight loss methods used in treating morbid obesity when other treatments such as diet, increased physical activity, behavioral changes, and drugs have failed (Gulinac et al., 2023).
- *Obesity* - A medical condition characterized by excessive accumulation of body fat that results from the impairment in energy balance mechanisms (Dhurandhar, 2022).

- *Medication Reconciliation* **–** is a process to prevent medication errors at transitions of care by building a complete list of a person's medications, checking them for accuracy, and reconciling and documenting any changes. (Redmond et al., 2018).
- *Morbidity* **-** A state of being symptomatic or unhealthy for a disease or condition (Hernandez & Kim, 2022).
- *ERAS Protocol* – Enhanced recovery refers to a patient-centered, evidence-based, multidisciplinary team-developed pathways for a surgical specialty and facility culture to reduce the patient's surgical stress response, optimize their physiologic function, and facilitate recovery (American Association of Nurse Anesthesiology AANA, 2023).
- *Post Operative Complications* **–** any deviation from the normal postoperative course. (Manekk et al., 2022).

Chapter Summary

In chapter one, a concise description of the problem erupting a need for change in practice, the rationale for EBP change, the project's specific aim, the PDSA theoretical framework guiding this evidence-based DNP project, and definitions of terms were presented. A detailed analysis and synthesis of the available wealth of knowledge supporting the implementation of an efficient and effective medication reconciliation will be presented in chapter two.

CHAPTER TWO

AVAILABLE KNOWLEDGE

Search Strategy

The literature search was limited to peer-reviewed, scholarly journals published in English within the last five years. Keywords used in the search were selected to reflect directly on the stated PICOT question. Terms included ERAS, ERABS, medication reconciliation, postoperative complication, and bariatric surgery. Search results were further interwoven to yield more literature. Search truncations included Bariatric surgery + medication reconciliation, bariatric surgery + ERAS, bariatric surgery + postoperative complications + morbidity.

Literature was located using a computerized bibliographic database search of publications from the disciplines of nursing and medicine. The databases utilized included EBSCOhost, Cumulative Index to Nursing and Allied Health Literature (CINAHL), ProQuest, Google Scholar, and the Cochrane Database of Systematic Reviews.

The inclusion criteria searched included studies that addressed the PICOT question with a primary focus on quality and consistent evidence. Limiting search phrases, including the English language, non-medication reconciliation, and ERAS protocols, allowed for excluding studies that provided no value to the project. A total of one hundred and six articles were yielded. Fifty-one articles were excluded because they did not answer or address the PICOT question, leaving fifty-five full-text articles assessed for eligibility after de-duplication. Thirty-four articles were further excluded for reasons of studies being pilot studies, integrated studies, systematic reviews, and exploratory studies. Twenty-one articles from primary sources were utilized for literature review after being evaluated for level and quality using the Melnyk Nursing Evidence-Based Practice Rapid Critical Appraisal Tool. (Appendix A – Search Strategy Schematic).

Literature Review

A comprehensive review of the literature and available knowledge yielded a considerable wealth of evidence that an ERAS-based medication reconciliation discharge process that commences preoperatively reduces the chance of harm to patients, reduces medication errors, increases patient safety, and, most importantly, improves postoperative outcomes. Themes utilized in the review for this DNP project include the impact of implementing ERAS protocols in bariatric surgery, the effect of ERAS on improved patient outcomes, patient satisfaction, increased volume, and reduced organizational cost, how an effective and standardized medication reconciliation reduces medication errors at transitions of care while increasing patient safety and understanding of their care process and reducing LOS, postoperative complications, and morbidity.

ERAS Protocols

Enhanced Recovery After Surgery (ERAS) is an evidence-based, patient-centered, multimodal, interdisciplinary, and comprehensive pathway to maintain perioperative function and reduce profound stress response following surgery. It consists of interventions focused on improving patient care and outcomes postoperatively (Zhou et al., 2021).

The synthesis of various research highlights ERAS as an all-inclusive method that improves patient outcomes and streamlines healthcare costs. With reduced complications after surgery, fewer days in the hospital, and significant savings on treatment costs, ERAS offers a new process that healthcare facilities should adopt to ensure optimal surgical care. When effectively implemented, ERAS paves the way toward reduced hospitalization, improved patient satisfaction, and reduced complication rates without hospital readmissions (Valecha et al., 2020).

Medication Reconciliation

Medication reconciliation is a thorough and structured procedure that entails reviewing and validating a patient's medication list at several points in their healthcare journey. The significance lies in avoiding medication mistakes and adversative drug interactions and improving patient outcomes. In the framework of healthcare, standardized medication reconciliation offers a methodical context to reduce medication errors, advance patient safety, and improve the quality of care.

The Joint Commission urges healthcare organizations to leverage available information technology to establish accurate medication reconciliation. Implementing electronic systems such as EHRs can streamline the process, reduce human error, facilitate real-time access, and enhance the accuracy and efficiency of medication information (The Joint Commission, 2023).

ERAS in Reducing LOS and Complications

ERAS protocols have been adopted and implemented in various surgical specialties to enhance patient outcomes and reduce LOS. Navarro-Martínez et al. (2022) conducted an observational retrospective study of 200 (120 received conventional care and 80 ERABS care) patients who had elective Roux-en-Y gastric bypass at a hospital in Valencia, Spain, to assess the effect of an Enhanced Recovery After Bariatric Surgery (ERABS) protocol on the LOS of patients who were undergoing bariatric surgery. This study shed light on how advocating for ERABS helps in the fast recovery of bariatric surgery patients by showcasing statistically significant results of patients who had undergone the protocol remaining in the hospital for only two days while the control group remained for four days. Though there was no statistically significant difference between the control and conventional groups regarding 30-day postoperative complications, the data depicted an almost 50% reduction in LOS.

Enhanced Recovery After Bariatric Surgery has been extensively implemented in colorectal surgery, resulting in momentous improvements in patient outcomes. A pre-and post-quasi-experimental study by Guisado-Gil et al. (2021) focused on ERAS implementation in colorectal surgical patients, emphasizing cancer patients. A medication reconciliation (MR) program was designed by a multidisciplinary team (pharmacist, internist, and surgeon). This MR was utilized to examine 308 study participants who were admitted to a Coloproctology Unit of an academic tertiary care hospital to investigate its effect on the LOS, preventable surgery cancellation, and development of postoperative complications. No significant difference was observed concerning the global mean LOS. The results further revealed that quick action hours leading to surgery were linked with reduced complications, shorter hospital stays, and lower costs.

Further examining the impact of ERAS on the reduction of postoperative complications and LOS, a prospective randomized control study by Fair et al. (2023) retrospectively reviewed 319 (87 ERAS, 232 pre-ERAS) participants who underwent bariatric surgery between October 2018 and January 2020. This study used propensity matching to compare both groups. Despite participants who partially completed or deviated from ERAS implementation, a significant outcome reduced the odds of complications by 54% and decreased LOS by 15%. At the same time, patients who completed the ERAS protocol had an 83% reduction in the odds of complications and a 31% decrease in LOS.

Medication Reconciliation in Reducing Medication Errors

A prevalent problem in today's healthcare system is medication errors. Implementing an efficient medication reconciliation plays an integral role in avoiding the potential cascading effects of errors. Results of a QI study conducted over 16 months in two Saudi Arabian hospitals

demonstrated a significant reduction in unintentional discrepancies both at admission and discharge from the hospital after implementing a standardized medication reconciliation process (Alghamdi et al., 2023). This QI project utilized the High 5's project medication reconciliation by the World Health Organization (WHO), and Medications at Transitions and Clinical Handoffs (MATCH) toolkit for medication reconciliation by the Agency for Healthcare Research and Quality (AHRQ) design and the Institute for Healthcare Improvement (IHI) model to pilot, evaluate, and eventually implement a standardized medication reconciliation at 18 Ministry of Defense Health Services (MODHS) hospitals in Saudi Arabia. The study outcome reflected a fraction, and the percentage of patients with at least one outstanding unintended discrepancy during hospital admission was condensed by 20% (27% to 7%) and at discharge by 12% (17% to 5%). This clearly shows the efficiency of standardizing medication reconciliation in reducing errors and improving patient safety.

A conflicting study that aimed to explore the significance of medication reconciliation at the time of hospital admission and its subsequent consequence on post-hospital discharge resulted in different outcomes. This randomized control trial (RCT) study by Ceschi et al. (2021) focused on a subset of patients aged 85 years or older with multifaceted medication regimens. Employing a 3-step medication reconciliation process on admission at two secondary teaching hospitals in Southern Switzerland, 1702 patients who met the inclusion criteria were studied to evaluate its impact on patient-centered health. Despite the increasing prevalence of medication discrepancies and potential medication errors among this patient group, the findings deduced that medication reconciliation at admission did not substantially affect these outcomes. At the study closeout, the percentage of patients with unintentional all-cause hospital visitations to the ED paralleled in both the intervention and control groups, respectively.

Medication Reconciliation in Hospital Transitions

Medication reconciliation is particularly important in transitions between care settings. Kreckman et al. (2018) highlighted the encounters in medication reconciliation during the period of change of care at Family Medicine Hospitalist Service, a 500-bed tertiary care facility. A Transition of Care Team was developed to oversee the entire redesign of the medication reconciliation process with a sample size of 30 preintervention and 70 postintervention participants. The institution of this transition of care team led to a remarkable reduction in medication errors. After team members undertake their specified roles (the nursing staff and medical resident verify medications on admission, the primary care physician is tasked with reviewing reconciled medications at admission, during hospitalization, and verbally signing out to the outpatient provider for continuity of care), the percentage of charts with mistakes improved from 25.8% to 65.7% at hospital discharge and from 51.6% to 91.4% at hospital follow-up visits. The formation of this transition of care team removed the silo structure of medication reconciliation that existed before the change and established that a standardized approach to medication reconciliation during care transitions improves patient safety and continuity of care.

Interdisciplinary Involvement in Medication Reconciliation

Pharmacists play a critical part in medication reconciliation. Their involvement can significantly advance the accuracy of the reconciliation processes. A retrospective review design study by Nguyen et al. (2022) investigated the impact of a medical student pharmacologist reviewing prescriptions in discharge summaries (DS) to confirm accuracy in a total sample size of 53 participants (22 intervention and 31 control patients) in the study conducted at a general medicine ward of a metropolitan hospital in Australia. The outcome of this study showcased that

patients who received the pharmacist review were significantly less likely to have medication blunders on their DS, both for any medication mistakes and high-risk medication errors. The time required for the intervention was moderately short, making it an effective way to augment medication reconciliation and reduce errors.

Moreover, the QI project conducted by Dabrowski and Lawrie (2021) further addressed the same medication reconciliation at the hospital's admission point. This study, conducted at the Capital and Coast District Health Board (CCDHB), Wellington, New Zealand, offered insights into the encounters associated with this process and the policies employed to improve it and noted the exactness of prescribing and reconciling medications during the admission stage as vital in ensuring patient safety throughout the hospital stay and upon discharge. Of the three PDSA cycles completed, an increase from 0% to 35% in completed medication reconciliations by providers was achieved by the third PDSA cycle. Though the goal to increase the percentage of discrepancies rectified by doctors from 80% to 90% was not met, the discrepancies rectified decreased across all PDSA cycles compared to baseline, reaching a peak at cycle 2 at 57%. This study touched on current literature elucidating the effects of employing an interdisciplinary medication reconciliation process involving pharmacists offering a platform to improve patient safety and quality initiatives within healthcare settings.

Medication Reconciliation and Patient Understanding

Discharge instructions are a critical constituent of medication reconciliation. DeSai et al. (2021) envisioned assessing and advancing patient know-how about treatment and discharge plans in the Emergency Department (ED) through a PDSA QI project. A simplified information page (SIP) was developed to enlighten patients about their most significant discharge directives. Eighty-six of the one hundred and eighteen (73%) patients interviewed rated ED staff a 10/10

rating using a Wilcoxon signed rank pre- and post-intervention test. The SIP had a constructive influence on patient understanding, as it positively improved patient know-how of their discharge instructions. This SIP stressed the significance of effective communication in the medication reconciliation process. This process ultimately contributed to better patient understanding and safer transitions of care.

Scarfield et al. (2022) set to enhance the standards and consistency of discharge summaries across acute medical wards at a busy district general hospital. This change was amenable through a robust, structured PDSA quality improvement methodology. The study authors utilized a multifaceted approach to identify and rectify gaps in the discharge process. The project outcome demonstrated significant and sustained results with the development of a standardized discharge summary format embodying 10 core elements, involving the collaboration of pharmacists and a direct clinician feedback mechanism. The first PDSA showed an increase in compliance from a baseline of 55% to 97%, the second PDSA increased from 61% to 92%, the third PDSA increased compliance to 91%, and the fourth PDSA compliance increased to 93%. The PDSA cycles in the project authenticate that a simplified and standardized discharge process helps to provide patients with more precise summaries and ease of understanding.

Medication Reconciliation and Patient Safety

Medication reconciliation provides a viable process for improving patient safety. Tamblyn et al. (2019) conducted a cluster-randomized study of 3491 patients discharged from two medical and two surgical units to weigh the effect of automated medication reconciliation (Right Rx). This study emphasized the reduction of adverse drug events (ADEs) in patients who were discharged from these units. Though the electronic medication reconciliation significantly

condensed medication inconsistencies, it did not lead to a reduction in ADEs or other adversative outcomes within 30 days post-discharge. This suggests medication reconciliation is central to reducing discrepancies; other interventions may be needed to mitigate ADEs and improve patient outcomes.

On the contrary, in a study conducted by Botros and Dunn (2019), focus was placed on enhancing the accuracy of discharge prescriptions, a vital factor in ensuring patient safety during care transitions. The percentage of patients with an accurate discharge medication list increased from a baseline of 61.5% to a median greater than 95%. This study addressed a critical feature of healthcare where accurate communication of medication-related information is supreme. This study aligned with a wider body of evidence contributing meaningfully to medication reconciliation, inter-professional partnerships, and patient safety.

Darcis et al. (2023) undertook a prospective interventional case-control utilizing a pharmacist examining medication reconciliation and medication review in patients undertaking oral chemotherapy using an adapted medication appropriateness index (aMAI) tool. At the start of the study, the aMAI review tool reported that medication lists were incomplete in 74.1% of patient cases reviewed in the electronic patient record (EPR). Significant results were noted after the implementation of the aMAI review tool and medication reconciliation by pharmacists. The eMAI score decreased from 7.2 to 5.4. Though recommendations for further studies and research to be conducted exploring more broadly the clinical implications of these interventions in oncology, the authors did not fail to emphasize the great potential in improving patient safety and providing quality care.

Jarrett et al. (2019), similar to Darcis et al. (2023), employed a MedManage tool to identify and monitor typically underreported medications and help mitigate risk for potential

medication interactions. This MedManage tool, developed by an interdisciplinary team, combined a chart audit tool and medication reconciliation. Before using MedManage, 82% of patients reported not knowing the importance of communicating any over-the-counter (OTC) drugs used to healthcare providers. The study outcome revealed a steady and quick increase in discharge medication prescription accuracy rates from 45% to 96%. MedManage proved effective in improving the accuracy of medication reconciliation.

Rojas-Ocaña et al. (2023) applied a qualitative research design set to investigate communication barriers and facilitators in the medication reconciliation process that providers encounter during hospital discharge through semi-structured questions. The barriers and facilitators of communication identified were noted as valuable in maintaining medication accuracy, encouraging patient engagement in the discharge process, enhance patient safety and quality of care during the transition of care.

More profoundly, Al Anazi (2021), a descriptive cross-sectional study, examined the medication reconciliation (MedRec) process and its positive effects on enhancing patient safety during medication management. The author intensely explained the role of information technology in MedRec and the challenges that it poses. Narrowing down to the data outlined in this article, 81% of the respondents in the survey acknowledged the importance of technology tools. Additionally, approximately 62% of the respondents who participated in the survey appreciated the role of the EHR. Electronic health records were noted to prevent medical errors compared to traditional paper platforms. Moreover, 41% of survey respondents appreciated Personal Health Records (PHR), and 33% thought electronic medication registration lists were a crucial part of the MedRec process. Al Anazi's study reiterates the significance of a well-designed MedRec process backed by information technology solutions.

ERAS in Bariatric Surgery

ERAS is a wide-ranging method of perioperative care for surgical patients, purposing to advance outcomes and fasten recovery. A study by Zhou et al. (2021) and Van Prooyen et al. (2023) retrospectively studied and reviewed clinical data from patients undergoing primary laparoscopic bariatric surgery. Zhou et al. (2021) compared two groups: one managed with conventional care and the other with ERAS protocols. The analysis of this study's results depicted noteworthy benefits in the ERAS group, which included a shorter LOS and a higher discharge rate during the first postop day compared to the conventional group. Precisely, ERAS led to a 2.2-day shorter stay in the hospital compared to patients receiving conventional care and a first-day discharge percentage of 15.2% compared to 1% in the conventional care group.

Another study by Altman et al. (2019) utilized a structured literature review methodology to present the principles and key components of ERAS and the importance of a multidisciplinary team in reaping the full benefits of its implementation. While Altman et al.'s (2019) article highlighted the impact of ERAS on decreasing postoperative complications and improving patient satisfaction, it acknowledged barriers that may be encountered during implementation and offered healthcare organizations recommendations to overcome obstacles if they endeavored.

Impact of ERAS on Bariatric Surgery Volume and Costs

Taylor et al. (2020) steered an observational cohort study to evaluate the effect of ERAS adoption on the volume and costs of the bariatric operation process. They testified a 25.6% upsurge in bariatric surgery volume after the implementation of ERAS protocols. This adoption was linked with a remarkable decrease in the length of hospital stay (from 2.77 days to 1.77 days) and median cost (from $11,739.03 to $9482.18) per patient. In addition, the 30-day

readmission proportion rate lessened from 7.94% to 2.86%. These conclusions emphasized that ERAS affects cost-effectiveness and improves the efficiency of postoperative bariatric surgical procedures. This validation of ERAS proves its impact on improving patient outcomes and experience and offers substantial economic benefits to the healthcare sector.

ERAS and Improved Patient Outcomes

In the analysis of ERAS on patient outcomes, a retrospective cohort study by Díaz-Vico et al. (2022) explored the significance of employing an ERAS pathway for bariatric surgery. Díaz-Vico et al. (2022) revealed that several paybacks of ERAS existed. These benefits included reduced postoperative opioid and antiemetic use. In their study, patients who received ERAS protocols could experience better control of postoperative nausea and vomiting (PONV). Even though the decrease in median length of hospital stay (LOS) was not statistically significant, the noted moderate decline marked an effect. Moreover, ERAS implementation showed potential in reducing 90-day postoperative readmissions and major postoperative complications and morbidity.

ERAS and Medication Reconciliation on Patient Satisfaction

Patient satisfaction remains a vital feature of healthcare. This satisfaction can be achieved and positively impacted if ERAS protocols are implemented. Patients who undergo bariatric surgery and receive ERABS care were reported to experience higher satisfaction scores than those who receive traditional care (Navarro-Martínez et al., 2022). This study supports the idea that the patient-centered method of ERAS, emphasizing preoperative education and patient involvement, can potentially improve the general patient experience and satisfaction. To further support this statement, a study conducted by Botros and Dunn (2019) disclosed a remarkable improvement in the accuracy of discharge prescriptions from 45% to 96% in the pilot ward,

highlighting the efficacy of the intervention. Both studies highlight the use of standardized procedures and multidisciplinary partnerships as crucial aspects in advancing the MedRec process that leads to patient satisfaction.

In conclusion, this literature review underscores the key importance of an effective medication reconciliation process in conjunction with an evidenced-based ERAS protocol. A standardized, effective, and efficient medication reconciliation is a basic element in ensuring patient safety is prioritized during transitions of care. As ERAS revolutionizes perioperative care, medication reconciliation plays a parallel task in reforming patient outcomes, enhancing the quality of care, and increasing patient satisfaction. Medication reconciliation offers increased protection against postoperative complications and morbidity that may ensue. ERAS, a clinical pathway, continues to play the role of a catalyst, setting precedence for innovative developments and improvements contributing to streamlining healthcare outcomes.

Chapter Summary

In chapter two, the literature review was presented concisely and in detail. The database search strategy with keywords and phrases used to gather evidence of current knowledge relating to the DNP project was presented. The collected evidence was analyzed and synthesized. Chapter three will discuss the organizational structure and culture, project barriers and facilitators, organizational support, and identify key stakeholders while expatiating how the DNP project would benefit the organization and patients/providers.

CHAPTER THREE

METHODS

Context

This DNP project implementation occurred at Long Island Jewish-Forest Hills Hospital Center in the County of Queens, New York. This 312-bed community teaching hospital provides inpatient medical, surgical, intensive care, and women's health services (Northwell, 2024). Forest Hills Hospital is one of the twenty-three Northwell Health Care System hospitals. The largest healthcare employer in New York State and the second largest secular, non-profit health system in the United States, with over 700 outpatient facilitates, 120 graduate programs, and over 85,000 employees. The organization's mission, vision, and values strive to improve the health of communities served with a commitment to providing the highest quality clinical care, educating current and future generations of healthcare professionals, searching for new advances in medicine through the conduct of biomedical research and promotion of health education (Northwell, 2024).

The hospital has a growing bariatric surgery program accredited and designated as a center of excellence by the American Society for Metabolic and Bariatric Surgery (ASMBS). The team consists of two attending bariatric surgeons, assisting NP/PA in the outpatient clinic, a Dietician/Nutritionist, and a bariatric surgery coordinator. The team collaborates and partners with several healthcare providers in the community to assist bariatric surgery patients in completing preoperative requirements. As a teaching community hospital, support for research and quality improvement projects that advance patient care outcomes and improve safety is strongly embraced. With full support from organizational leadership and key stakeholders, this

DNP project successfully implemented an efficient, effective, standardized medication reconciliation process at discharge for the bariatric surgery population.

The key stakeholders of this DNP project consisted of hospital leadership, attending bariatric surgeons, NPs in the PST department, PAs, and RNs on the surgical floor. This project benefits the organization's patient safety initiatives by enhancing patient adherence to postoperative instructions, increasing patient and provider communication on the importance of postoperative medications, and ultimately preventing postoperative complications and morbidity. The healthcare framework cannot overstate the significance of an operative and effective medication reconciliation procedure. It is vital in ensuring patient safety, particularly during care transitions. Potential barriers include staff non-compliance with the revised discharge process, not due to defiance but forgetting to apply the new process. Facilitators of the project include maintaining an open communication channel with care providers as the process is ongoing and utilizing feedback from care providers to brainstorm subject matter expertise on how to amend the process as necessary for project sustainability, pending the organization's plan to launch a new EHR system (Epic) late 2024 into 2025.

Interventions

The PDSA cycle effectively assessed, revised, implemented, and evaluated this QI project. The project team members included the DNP student who is a coordinator in the PST department, two bariatric surgeons, surgical floor nurses, surgical floor PAs, NPs in the ambulatory setting, and IT. The project sample consisted of adult bariatric patients 18 years and older who were scheduled for either of the two bariatric surgical procedures offered at the hospital - SG, RYGB, or conversion from SG to RYGB during the project's scheduled 6-week timeframe. Patients were excluded from the project if they were over the age of 65 (advanced

age increases postoperative complications), scheduled for a revision bariatric surgery, and/or had initial surgery performed at a different facility than the project site.

After formally presenting the DNP project proposal and receiving approvals from the organization's leadership and Wilmington University's Human Research and Subject Committee (HRSC) (Appendix B), the implementation of the supported EBP project standardizing medication reconciliation and improving discharge process within the bariatric surgery population commenced on February 5, 2024.

The intervention for this EBP project began with a consultation with IT to create a "Bariatric Acronym" shared hard drive accessible to all bariatric care providers. Progress of the project continued with the training of bariatric care providers guided by a 30-minute PowerPoint presentation (Appendix C) facilitated in collaboration with surgical floor and PST managers. A question-and-answer session followed, which allowed for uniformity in the project, a symbolic key to its success. The DNP project leader collaborated with the bariatric surgery coordinator, bariatric surgeons, surgical floor manager, PST manager, and NP/PA's inpatient and ambulatory to improve the medication reconciliation discharge process for the bariatric surgery population. Project team members were furnished with the goals and benefits of process change and the need to embrace evidence-based intervention into practice.

Study of the Interventions

Data for bariatric surgery patients with an adequate discharge process, including a complete medication reconciliation pre- and postoperative, was reflected on discharge instructions and retrospectively reviewed for six weeks before implementation. The last Semi-Annual Report (SAR) was also reviewed, highlighting seven postoperative complications and one mortality. The morbidity rates for Laparoscopic Sleeve Gastrectomy (LSG) and Roux-en-Y

Gastric Bypass (LYRGB) were 2.59% and 6.50% respectively. While it did not place the intended project organization as an "Outlier," it did place the organization in the "Need Improvement Category." The organization aims to lower the LSG and LRYGB morbidity rates to an expected rate of 1.37% and 3.1%, respectively. The current discharge was revised and simplified to include all pertinent information needed by the patient for a positive postoperative outcome. This simplified discharge page was created under a hard drive accessible to all care providers, and it is named the bariatric acronym (Appendix D). This simplified discharge note will summarize the postoperative medication regimen (completed through the new medication reconciliation process) to be included in the final documents given to the patient for a better understanding and adherence to the postoperative treatment plan, thus yielding a positive outcome. The data collection tool surveyed variables such as age, gender, race, and type of bariatric surgery. Data collection also reflected if medication reconciliation was entered during the PST appointment and if the simplified discharge note was included in the final hospital discharge summary.

Measures

Data was collected entirely from patients undergoing bariatric surgery who met inclusion criteria during the six-week project implementation phase. Project outcomes were compared to the same period of the year before implementation. Twenty-eight bariatric surgery patients were from the first quarter (Jan – March) of 2023. Seven of these 28 patients developed postoperative complications (6) and morbidity (1). The newly revised medication reconciliation process implementation commenced the week of February 5, 2024, and ended the week of March 11, 2024. Outcomes measured included no readmissions that would signify postoperative complications and that the newly revised medication reconciliation process was followed. The

process commenced with postoperative medications entered into the inpatient EHR during the presurgical testing visit by the advanced practice provider. These postoperative medications are efficiently reconciled and documented accurately in inpatient EHR and are readily available at discharge. At discharge, accurately reconciled postoperative medications with the simplified and inclusive "bariatric acronym" discharge instructions are explained and provided to the patient upon discharge. For data analysis, the doctoral student/project leader collaborated with the bariatric coordinator to collect data on whether medication reconciliation was entered preoperatively, whether the new process was facilitated at discharge, and whether any readmissions signify postoperative complications.

Analysis

A pre-and post-implementation of the revised discharge process statistical analysis method was utilized to measure the project's outcomes. Initial data collected from the project was entered into a Microsoft Excel data collection tool and then analyzed using the Statistical Package for Social Sciences (SPSS) version 29 for descriptive analysis and outcome measurements. Pearson's chi-square analysis was also employed to assess the difference in the frequencies of the postoperative complications. This project sought to showcase that implementing a standardized medication reconciliation protocol improves post-surgical outcomes and decreases complications. Data analysis was collated by a statistician not affiliated with the doctoral student.

Budget

This DNP project development and evaluation of an ERAS-based preoperative medication reconciliation discharge process to decrease postoperative complications and morbidity presented minimal to no financial risk to the project organization. Taylor and colleagues reported a reduction in length of stay and 30-day readmission with total cost savings

greater than $800,000 in one calendar year after implementation within the bariatric surgery population, benefiting both patient and hospital systems (Taylor et al., 2020). Based on the conclusion of Altman et al. (2019), implementing a standardized ERAS-based medication reconciliation protocol leads to savings of $2,200 - $2,500 per patient and an estimated $3.08 in return for every $1 invested. Botros and Dunn (2019) noted that implementing a standardized medication reconciliation in the discharge process provides an avenue to successfully reduce variation, which in turn helps reduce both harm and waste.

This DNP project did not require initial capital expenses, and implementation of the revised medication reconciliation process did not incur any associated costs. Even though profit was not anticipated, there was potential cost savings as the intervention prevented postoperative complications and morbidity. The resources used to facilitate the project were products owned and readily available for use at no cost. The organization employed members of the multidisciplinary team and stakeholders who were part of the DNP project's success, which provided an opportunity to implement changes, avoiding any financial strain. The project leader's time was voluntary as part of the academic program requirements for a Doctoral Nursing Degree at Wilmington University. No external funding and/or conflict of interest was sustained.

Ethical Considerations

This DNP project's requirements for human subject training was accomplished by completing the Collaborative Institutional Training Initiative (CITI) (Appendix E) before applying to Wilmington University's Human Subjects Review Committee (HRSC). Standards for Wilmington University were met, and approval was granted on October 26, 2023. Approval from the project institution – Forest Hills Hospital, was also received before implementation (Appendix F). The ethical principle of respect was maintained in its entirety during project

implementation. Project participants were exposed to minimal to no risk intervention as it was conducted as part of the routine bariatric surgery appointments. Collected data was protected and secured following HIPAA privacy guidelines.

Chapter Summary

Chapter three presented the context of the project implementation, the benefits of the newly revised process to the organization, a complete description of the implementation, the budget, and ethical considerations upheld to maintain the protection of patients while comprehensively presenting the methodology utilized for the analysis of project outcome. Chapter four will provide the sample characteristics, demographics, and results of this evidence-based practice project.

CHAPTER FOUR

RESULTS

Sample Characteristics

Data from the records of patients receiving care for bariatric procedures was collected before and after the implementation of the quality improvement project involving a revised standardized medication reconciliation discharge process. Data was collected in Microsoft Excel on $N = 42$ patients, with 28 patient data collected from current practice and 14 patients after implementation of the revised process. The data was examined for missing values or errors before analysis.

The sample demographics were described using age, gender, and race/ethnicity. These characteristics were reported using means, standard deviation, and range or transformed using numerical codes and reported using counts and percentages. The data for $N = 42$ patients were imported into SPSS (version 29) for descriptive analysis and outcome assessment of postoperative complications. The demographic characteristics were provided to describe the sample of patients benefiting from the new practice. The descriptives and outcomes were described in the narrative and displayed using tables and figures. Pearson's chi-square was employed to assess the difference in the frequencies of the postoperative complications.

This analysis provided an evidence-based and reliable assessment of the frequencies. Pearson's chi-square assesses frequencies or counts collected from two independent groups. The complications were collected from patients. Statistical significance was assessed and determined to be significant as the p level was less than .05. Clinical significance was demonstrated by a measurable decrease in the frequencies of complications after implementation of the revised medication reconciliation process.

Project Findings

Data from 42 patients were collected to assess the standardized medication reconciliation's impact on the frequency of postoperative complications after bariatric surgery. Two independent groups of patient data were collected. Data from 28 patients was collected from current practice or before implementation. A post-implementation group of 14 patients was collected after implementing the QI project. Demographics were collected from the post-implementation patients (n = 14) who had the newly revised medication reconciliation process during discharge. As noted in Table 1, the post-implementation group's mean age (years) was 45.29 years (SD = 11.11), with a range of 27 - 65 years.

Table 1

Demographic Characteristics of Age

Baseline characteristic	Sample		
	M	*SD*	*Range*
Age (years)	45.29	11.11	27 - 65

Note: N = 14, demographic characteristics only available on the post-implementation data. *M* – mean, *SD* -standard deviation, *Range* - minimum and maximum

Gender and race/ethnicity were described using frequencies and percentages (see Table 2). The post-implementation patients' gender composition was 100% female (n = 14). The racial makeup of the post-implementation patients was 7% Asian (n =1), 43% Black (n = 6), 43% Hispanic (n =6), and 7% White (n =1). (See Table 2)

Table 2

Frequency Characteristics of Patient's Gender and Race/Ethnicity

Baseline characteristic	*N*	*%*
Gender		
Female	14	100%
Race		
Asian	1	7%
Black	6	43%
Hispanic	6	43%
White	1	7%

Note. $N = 14$, demographic characteristics only available on the postimplementation data.

The frequencies of the types of procedures and complications were collected in both the current practice and post-implementation groups. (see Table 3) The frequencies and percentages of procedures scheduled in the current practice patients were 68% lap sleeve gastrectomy ($n = 19$), 25% lap gastric bypass ($n = 7$), and 7% lap removal of the band ($n = 2$). The ERAS practice patients were 57% lap sleeve gastrectomy ($n = 8$), 21% lap gastric bypass ($n = 3$), 7% lap removal of the band ($n = 1$), and 14% lap conversion ($n = 2$).

The frequencies and percentages of the complications in the current practice patients were 75% with no complications, 4% deep vein thrombosis ($n = 1$), 7% bleeding ($n = 2$), 4% dehydration ($n = 1$), 4% death ($n = 1$), and 7% other ($n = 2$). No complications were recorded in the ERAS post-implementation patients ($N = 14$, 100%). (see Table 3)

Table 3

Frequencies of Types of Procedures and Complications by Sample Group

	Current Practice (n = 28)	Post-implementation (n = 14)
	N (%)	*N (%)*
Type of Surgery		
Lap Sleeve Gastrectomy	19 (68%)	8 (57%)
Lap Gastric Bypass	7 (25%)	3 (21%)
Lap Removal of Band	2 (7%)	1 (7%)
Lap Conversion	0 (0%)	2 (14%)
Type of Complications		
No complications	21 (75%)	14 (100%)
Deep Vein Thrombosis	1 (4%)	0 (0%)
Bleeding	2 (7%)	0 (0%)
Dehydration	1 (4%)	0 (0%)
Death	1 (4%)	0 (0%)
Other	2 (7%)	0 (0%)

Note: $N = 42$

The outcome of postoperative complications was measured as a count or frequency collected before and after implementation. The frequencies of patients having a complication were compared using Pearson's chi-square test.

Seven of the 28 patients had complications reported in the current practice. After the implementation of the revised medication reconciliation at discharge, no patients had complications reported. Pearson's chi-square showed a statistically significant difference between the two groups in the frequencies of patients with complications [χ^2 (N = 42) = 4.20, p = .040]. The p level of .040 was less than .05, indicating statistical significance. A decrease in postoperative complications demonstrated clinical significance, and no patient readmissions were reported after surgery.

Table 4

Crosstabulation and Chi-square Test Between Pre and Postimplementation Groups

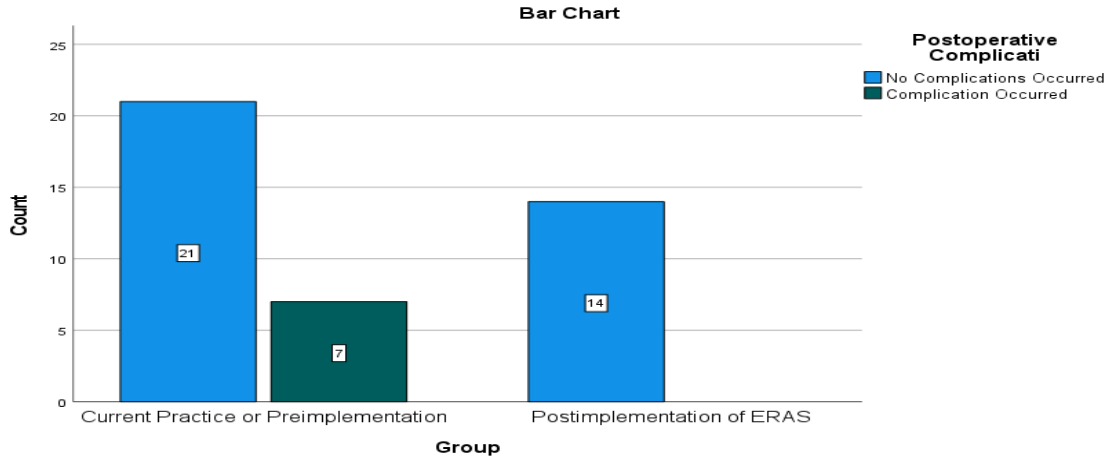
	Current Practice (n =28)		Postimplementation (n =14)			
	N	*%*	*N*	*%*	χ^2	*p*
Postoperative Complication	7	25%	0	0%	4.20	.040*
No complication	21	75%	14	100%		

Note: χ^2 = *Pearson chi-square, *P* < .05 -statistically significant

As noted in Figure 1, clinical significance was demonstrated by no complications reported in the 14 patients after the revised medication reconciliation was implemented at discharge. The blue bars show patients with no complications. The green bar indicates the frequency of complications in patients.

Figure 1

Bar Graph of Postoperative Complications by Group



Chapter Summary

Chapter four displayed this evidence-based DNP project's sample characteristics, demographics, and findings. Using tables, descriptions of the clinical and statistical significance

of the project results were also noted. Chapter five will provide an interpretation of the project results and its application to nursing practice while also coferring the limitations of the project. Chapter five also provides a plan for project sustainability and its application to the DNP Essentials.

CHAPTER FIVE

DISCUSSION

Interpretation

The purpose of this DNP project was to effectively implement a standardized preoperative medication reconciliation process at discharge that would decrease postoperative complications and morbidity. Two independent groups of bariatric patient data were collected. The frequencies of the types of procedures and complications were collected in both the current practice and postimplementation groups. The outcome of postoperative complications was measured as a count or frequency collected before and after implementation. The findings from the DNP project revealed that standardization of a medication reconciliation process in bariatric surgery patients preoperatively significantly reduces postoperative complications compared to conventional processes.

Key factors for this standardized medication reconciliation process were ensuring an efficient entry of postoperative medications during the preoperative phase. According to Han et al. (2022), standardizing the medication reconciliation ensures an appropriate medication management process of creating an accurate list of patients' medications compared to medications taken during the entire patient transition during hospital care. The strength of the DNP project was the partnership of the interdisciplinary team – bariatric surgeons, the floor nurses, the PA/NPs, department managers, and the continual support of leadership. These played a major role in the outcome of project findings. The anticipated and observed outcomes were expected.

Lack of and ineffective medication reconciliation standardization continues jeopardizing patient safety across the healthcare system. A plethora of studies have established evidence that

the standardization of medication reconciliation provides a viable process for improving and maintaining patient safety, increasing the accuracy of prescriptions at discharge, and decreasing healthcare costs while nourishing increasing interprofessional partnerships (Botros & Dunn, 2019; Darcis et al., 2023; Jarrett et al., 2019).

Limitations

Several limitations were identified during the implementation of this DNP project. The first limitation was the validity threat to the project's generalizability: the small sample size of 42 patients. It included 28 pre-implementation and 14 post-implementation groups. The second identified project limitation was the homogeneity of the sample population. There was 7% Asian (n =1), 43% Black (n = 6), 43% Hispanic (n =6), and 7% White (n =1). A third limitation was the lack of gender equivalency – more female than male patients. All 14 (100%) postimplementation patients were of the female gender. The fourth limitation was the unavailability of the pre-implementation groups' age, gender, and race, and the final identified project limitation was the short 6-week time frame allocated for project implementation.

Conclusion

This scholarly Doctoral of Nursing Practice Project comprised conducting a needs assessment and effectively revising, implementing, and evaluating a standardized medication reconciliation process to reduce postoperative complications in adult patients undergoing bariatric surgery at a community teaching hospital in New York City. The respective phases of the DNP project were methodically described in this manuscript. The DNP project commenced with a comprehensive patient and organizational needs assessment and an extensive literature review supporting a gap in EBP and current clinical practice at the project organization. The project goal was to enhance patient care outcomes and increase patient safety; project findings

revealed that patients who encountered an efficient and standardized medication reconciliation at transitions of care experienced decreased postoperative complications, increased patient adherence to treatment plans, and increased patient knowledge. Dissemination of project findings establishes evidence that standardization of medication reconciliation leads to decreased medication errors, discrepancies, and drug-drug interactions while reducing healthcare costs.

Implications for Advanced Nursing Practice

A contingent of a DNP-prepared nurse is the possession of sophisticated expertise in assessing organizations, identifying system issues, and facilitating organization-wide changes to support and provide leadership in promoting safe patient care within healthcare systems and/or academic settings (AACN, 2006). Examining bariatric surgery, its complications, and morbidity to medication reconciliation objectively will provide insight into understanding the complexities of its role in a successful postoperative course.

This DNP QI project comprehensively focused on improving patient safety initiatives and postoperative outcomes in bariatric surgery patients. This project demonstrated that standardizing medication reconciliation correlates with decreased healthcare costs through fewer medication errors/discrepancies and decreased postoperative complications in this patient population. As the project leader, the DNP student was essential in transforming healthcare delivery through multimodal and multidisciplinary MR standardization protocols, promoting high-quality, evidence-based care that positively influenced healthcare outcomes (AACN, 2006). This project's results have been instrumental in sparking the revision of current practices and policy changes for permanent integration and continuous enhancement of the postoperative recovery process.

Plan for Sustainability

To maintain achieved success garnered in any Quality Improvement (QI) Project, it is imperative to have in place key factors for the sustainability of implemented changes. According to Malone et al. (2022), Sustainability is "the extent to which an evidence-based intervention can deliver its intended benefits over an extended period after external support is terminated. Consistency in literature reveals that only about half of practice changes remain functional post-implementation (Malone et al., 2022). Though successful projects bring about gains for any organization or system, preserving it certainly does not present without challenges. Hence, there is an inherent need to have strategic plans to prevent the development of any such barriers.

For this DNP project, methods for its sustainability include the maintenance of effective and transparent channels of communication with major organizational stakeholders to secure ongoing support, continuous education of care team members, an open platform for expert opinion from members of interdisciplinary teams fostering collaborative partnerships that will positively affect changes and dissemination of project outcomes will conclusively allow for its integration at other bariatric surgery sites within the organization at minimal to no cost.

First, transparency in communicating with project stakeholders and the interdisciplinary team involved in process change is vital. These professionals will enable the creation of an environment that fosters and promotes project success and sustainability through any financial and policy approvals necessary as changes evolve, even though the project leader utilized available resources to achieve the desired outcome without increasing organizational expense. Secondly, project sustainability can also be maintained by presenting the continuous success of the newly instituted discharge process at monthly interdisciplinary meetings. Regularity of implementation success at these meetings is crucial as it enables rhythmic momentum of

changes. Lastly, continuous education/training of care team members allows for respect of expert opinion, addressing any hiccups or operational challenges that may arise. Disseminating project results at other bariatric surgery practices within healthcare organizations will also aid its sustainability.

Application of the AACN DNP Essentials

The American Association of Colleges of Nursing (AACN) positions the curriculum components to meet the requirements to confer the terminal degree for a Doctor of Nursing. DNP students must satisfy and fulfill all DNP essentials. These essentials enhance clinical leadership and economic and organizational skills that place DNP-prepared nurses in a unique position to incisively critique nursing practice and design patient care programs that are economically feasible, sustainable, and ultimately positively impact health care (AACN, 2006). It is imperative that DNP-prepared nurses fully understand and incorporate all eight DNP essentials of the AACN position statement when proposing changes or revisions to clinical practice as it promotes the highest quality of care and leads to optimal health care outcomes for all patient populations (AACN, 2006).

DNP Essential I: Scientific Underpinnings for Practice.

One of the DNP's tenets is applying science-based concepts to evaluate and enhance healthcare delivery while improving patient outcomes (AACN, 2006). DNP Essential I enabled the project to focus on the effect of a standardized medication reconciliation process at discharge to improve postoperative outcomes and reduce complication/morbidity. The DNP student collaborated with bariatric surgeons, the IT department, NP/PAs, and pertinent health care professionals to effectively revise, improve, and implement an Evidence-Based Practice (EBP). The DNP student embarked on a wide range of literature searches to shed light on medication

reconciliation's profound effect on patient safety. This search facilitated the aptness to translate science-based knowledge into the practice environment.

DNP Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking.

DNP Essential II allowed this project to be a platform to revise current clinical practice and successfully implement an evidenced-based intervention promoting the importance of patient safety in the bariatric surgery population at a community teaching hospital. Antecedent to the implementation of this DNP project, a comprehensive patient and organizational gap assessment was conducted with the assistance of key project stakeholders (Dr. Folek -Director of Bariatric Surgery) in conjunction with an in-depth review of evidence-based data on effective, standardized medication reconciliation processes. The DNP student employed scientific research to meet the current and future needs of these patient populations and the healthcare organization. Utilizing current staff and resources eliminates the financial burden on the organization and capitulates project outcomes and sustainability. Strategies that promote organization and professional collaboration through ongoing communication propagate initiatives that improve health outcomes and patient safety.

DNP Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice.

The Advanced Research and Clinical Practice Through Close Collaboration (ARCC) tool was employed to critically appraise existing literature in deciding the best available evidence for the DNP project (Melnyk et al., 2021). The DNP student constantly and continuously worked with healthcare professionals and leadership using analytical methods to revise, direct, and evaluate evidence-based clinical projects that ultimately improve patient outcomes. The DNP

project capitalized on safe, timely, high-quality, and patient-centered care (AACN, 2006). Amidst project implementation phases, relevant data was collected and secured in DNP students' Microsoft Cloud encrypted storage backed with a secure password following federal, state, and local regulations. Data was garnered methodically to certify accurate data collection and application (AACN, 2006). Using a credible statistician, data analysis was completed using appropriate statistical methods to evince project clinical significance. The clinically significant results from the project were disseminated to organization leaders, thus allowing the DNP student the ability to play a role in the translation of evidence-based research in practice, evaluation of evidence-based practice, improvement of the reliability of the healthcare outcomes, and participation in collaborative research (AACN, 2006).

DNP Essential IV: Information Systems and Patient Care Technology for Transformation of Health Care.

The vast and increasing use of EHR systems in healthcare organizations aids in transforming patient access and improving outcomes. The use of EHR systems played a major role during the implementation of this DNP project. After a thorough review of the failed interoperability of the two EHR systems, Allscripts (Ambulatory) and Sunrise (Inpatient) used in the organization, the DNP student emerged on a quest on how to mitigate the current process pending new system-wide EHR (Epic) launch in 2025. Collaboration with IT was essential to the success of this project through assistance with the creation of a shared drive named Bariatric Surgery Acronym, accessible to all care providers. Other IT usages during this DNP project included an Excel data collection template, project poster, and PowerPoint presentations (AACN, 2006). Throughout project implementation, the DNP student exhibited knowledge to efficaciously incorporate patient care information technology that supports practice leadership

and clinical decision-making; critical elements of technology that embody safe, efficient patient-centered care (AACN,2006).

DNP Essential V: Health Care Policy for Advocacy in Health Care.

This project provided a platform for the DNP student to demonstrate leadership in advocating the importance of implementing a standardized medication reconciliation process at discharge. This healthcare policy change was contingent on the abundance of evidence showing the impact of medication reconciliation and project outcomes. The DNP student was important in advocating, sharing, and implementing an evidence-based medication reconciliation intervention focused on improving patient outcomes, practice environment, and overall healthcare cost (AACN, 2006). The DNP student attended department and leadership meetings. These meetings allowed the DNP student to engage in the organization's healthcare policy process. It is a critical process for a DNP student to influence the development of healthcare policies that meet the needs of the patient population served.

DNP VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes.

The entire DNP project provided the DNP student with an excellent opportunity for collaborative relationships with several healthcare disciplines and leadership. Relationships occurred with bariatric surgeons, nurses, departmental heads, coordinators, advanced practice providers (NP/PAs), the IT department, statistician, manuscript editor, and clerical associates. The DNP student holding a leadership role while collaborating with an interdisciplinary team allowed for implementing clinical change to improve patient outcomes and decrease postoperative complications amongst the bariatric surgery population. Coordinating

collaboration of interdisciplinary teams to address clinical practice knowledge has the potential to erect changes for patients and communities.

DNP VII: Clinical Prevention and Population Health for Improving the Nation's Health

The DNP student displayed a major role in health advocacy for improving the health of the bariatric patient population by implementing a patient safety initiative. Through bio-statistical and scientific data analysis, scheduled bariatric patients had their postoperative medications transitioned efficiently through a new standardized medication reconciliation process. The doctoral student is empowered to address gaps in care, ensure health promotion/disease prevention, and evaluate care delivery models. Reducing medication errors through an effective, efficient, and standardized medication reconciliation would spur continuous dialogue and action on its importance to the nation's health.

DNP VIII: Advanced Nursing Practice.

The DNP project allowed the student to successfully design, implement, and evaluate a standardized medication reconciliation process at discharge to reduce postoperative complications. This project fostered therapeutic partnerships with patients and a multidisciplinary team of healthcare professionals while implementing a revised medication reconciliation protocol. The DNP student utilized variables to conduct a comprehensive and systematic assessment focused on the benefits of a patient safety initiative – medication reconciliation (AACN, 2006). Barriers encountered during the project were adequately addressed to increase success through open communication and subject matter expertise input from all team members.

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APPENDICES

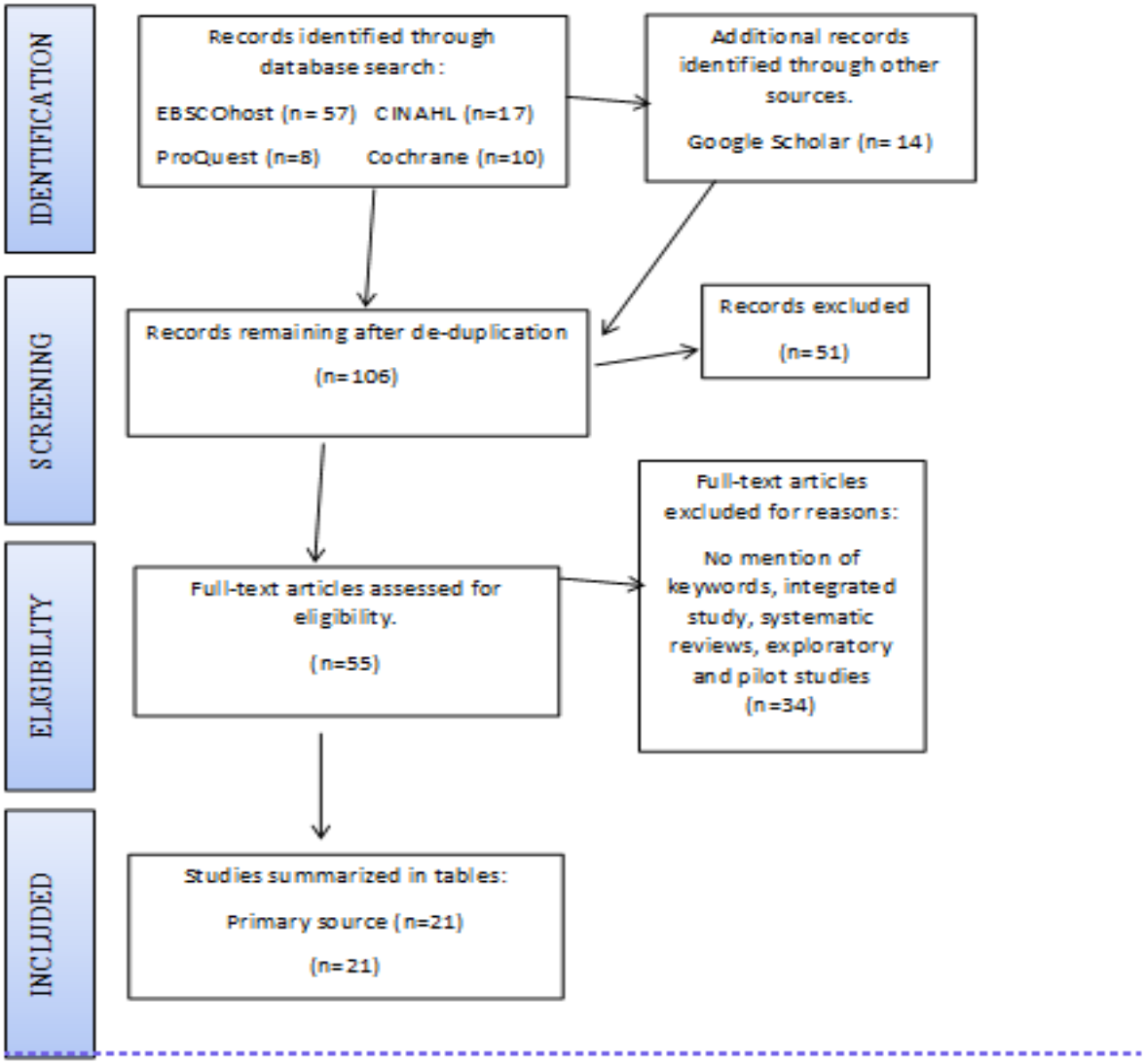
Appendix A

Search Strategy Schematic

EBP question: In adult bariatric surgery patients, how does the implementation of a preoperative medication reconciliation process, versus no preoperative medication reconciliation, affect postoperative discharge complications and morbidity over a 6-week?

Keywords: ERAS, bariatric surgery, discharge, medication reconciliation, ERABS, postoperative complications

Years: 2018 -2023 **Limiters:** English, scholarly, peer-reviewed journals, full text, EBP



Appendix B

Wilmington University HRSC Approval Letter

WILMINGTON UNIVERSITY
HEALTH PROFESSIONS & NATURAL SCIENCES

October 26, 2023

Adebola Osewa

Dear Adebola,

Wilmington University's Human Subjects Review Committee (HSRC) is pleased to inform you that your Doctor of Nursing Practice project proposal ***Development and Evaluation of a Nurse Practitioner-Directed Preoperative Medication Reconciliation Process to Reduce Postoperative Discharge Complications and Morbidity in Bariatric Surgery Patients at a Community Hospital*** was reviewed on *October 25, 2023*. The project was categorized as **Exempt** and meeting the requirements of a quality improvement intervention. Your signed HSRC form is attached.

Now that your DNP project has been approved by the HSRC, there are multiple elements with which you must comply. Wilmington University adheres strictly to these regulations:

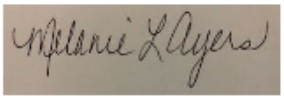
1. You must conduct your DNP project exactly as it was approved by the HSRC.
2. Any additions or changes in procedures must be approved by the HSRC before they are implemented.
3. You must notify the HSRC promptly of any events that affect the safety or well-being of subjects.
4. You must notify the HSRC promptly of any modifications to your DNP project or other responses that are necessitated by any events reported in items 2 or 3.
5. Your approval is provisional if you require Institutional Review Board approval from your organization. Once organizational approval has been obtained, please submit your signed approval and completed IRB application to DNP Administrative Assistant via email.

The HSRC may review or audit your project at random or for cause. In accordance with Wilmington University policy, the HSRC may suspend or terminate your DNP project if your project has not been conducted as approved and/or if other difficulties are detected.

While not under the purview of the HSRC, DNP students are responsible for adhering to US copyright law when using existing scales, survey items, and other works in the conduct of research/DNP projects.

In conclusion, you have developed an interesting evidence-based practice project aligned with the AACN DNP Essentials (2006). This is an important project for healthcare practices now and in the future. Best wishes for continued success.

Sincerely,



Melanie Ayers, DNP, RN, CNE
HSRC Committee Representative
Associate Professor, RN to BSN Program
College of Health Professions and Natural Sciences

Kathryn Leach, DNP, CPNP-BC
Chair, DNP Program
College of Health Professions and Natural Sciences

COLLEGE OF HEALTH PROFESSIONS AND NATURAL SCIENCES
320 N DuPont Hwy, New Castle, Delaware 19720

Appendix C

PowerPoint Presentation Training

ADEBOLA OSEWA, PMHNP-BC, FNP-BC
DNP STUDENT
WILMINGTON UNIVERSITY

REVISING PREOPERATIVE MEDICATION RECONCILIATION TO REDUCE POSTOPERATIVE COMPLICATION

FOREST HILLS HOSPITAL

1

OBJECTIVES

- Purpose and Design of the project
- Hospital Data leading to the bariatric surgery discharge process revision
- Describe the importance of an accurate medication reconciliation process (Cost, Current Data)
- New process and vital roles of care providers at each stage (process flow map)
- Expected outcome of 6 weeks QI project

2

PROJECT PURPOSE

- This DNP project intends to address a poor medication reconciliation process due to the failed interoperability with the two Electronic Health Records systems currently utilized at the proposed project site.
- This lack of systems interoperability causes inaccuracies in the medication reconciliation at discharge for the bariatric surgery population with results of postoperative complications and morbidity within a small practice at a teaching community healthcare facility in the metro New York area.

3

HOSPITAL DATA

- In the calendar year 2023, there was a total of 39 bariatric surgical cases.
- Amongst these total surgeries completed, 7 patients developed postoperative complications and 1 mortality.
- The morbidity rates for Laparoscopic Sleeve Gastrectomy (LSG) were 2.59% and Roux-en-Y Gastric Bypass (LYRGB) and 6.50% respectively for the 2022 SAR report. While it didn't place Forest Hills Hospital as an "Outlier", it did place the organization in the "Need Improvement Category". The organization's goal is to lower the LSG and LRYGB morbidity rates to an expected rate of 1.37 % and 3.1 %, respectively.
- A review of events that contributed to an increased Semi-Annual Risk Report (SAR) rating involved mostly cases of postoperative bleeding and deep Vein Thrombosis (DVT). These two postoperative complications culminated from a lack of two systems interoperability regarding medication reconciliation.
- This data is submitted to The Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP). A national accrediting body for bariatric surgery centers to comply with the provision of high-quality care for all patients (ASMBS, 2023).

4

COST

IN THE UNITED STATES ALONE BETWEEN 7,000 – 9,000 PATIENTS DIE OF PREVENTABLE DEATHS ASSOCIATED WITH MEDICATION ERRORS OCCUR PER YEAR AND COST THE HEALTH CARE SYSTEM ABOUT $40 BILLION ANNUALLY (TARIQ, ET.AL., 2023).

THESE ERRORS ARE COMMONLY ATTRIBUTED TO FAILURE TO ADEQUATELY COMMUNICATE MEDICATION INFORMATION AT TRANSITIONS OF CARE OFTEN RELATED TO FLAWS AND LACK OF STANDARDIZED RECONCILIATION PROCESSES AND FLAWED TECHNOLOGICAL SYSTEMS.

5

IMPORTANCE OF MEDICATION RECONCILIATION

Almghamdi, et, al. (2023) in a recent study revealed a statistically significant difference in improvement after implementing medication reconciliation in the percentage of patients with at least one outstanding unintentional discrepancy at admission and discharge.

Desai, et.al. (2021) - An SIP (Simplified Information Page) intervention can significantly increase discharge understanding through its ease of use and accessibility. – **Bariatric Acronym** for this DNP project

Altman, et.al (2019) – Reduced length of hospital stay, promotion of a quick return to mobility and functions postoperatively, reduction in rates of postsurgical complications and reduced surgical cost

The Joint Commission urges healthcare organizations to leverage available Information technology for the establishment of accurate medication reconciliation. Electronic Health Records (EHR) can streamline the process, reduce human error, facilitate real-time access, and enhance the accuracy and efficiency of medication information (TJC, 2023).

6

PROJECT DESIGN/OUTCOME MEASURE

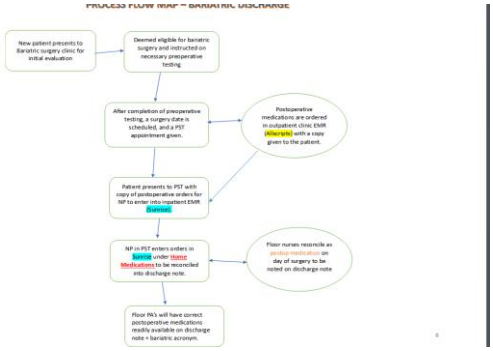
Focus on revision of medrec process to improve post operative complications, patient understanding and compliance with plan of care

Implementation with bariatric surgery patients scheduled within the 6weeks timeframe

Outcome measures – baseline vs post revised new process

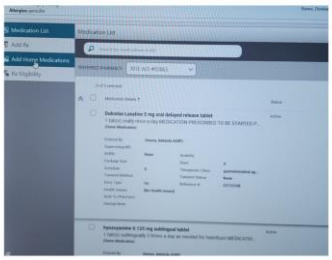
- Medication reconciliation at PST visit
- Implementation of new process facilitated at discharge

7



8

SUNRISE EHR DOCUMENTATION



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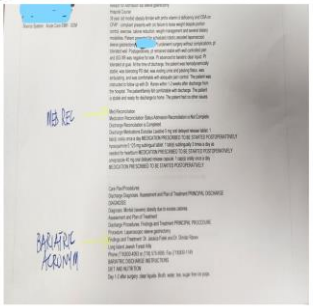

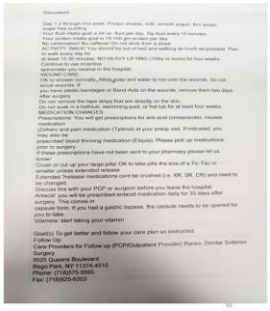

SUMMARY

This evidenced based DNP project aims to translate into practice the demonstration that making small changes such as facilitating an efficient, effective medrec process at discharge greatly impacts patient safety improvements and procedural outcomes, while, also effectuating an opportunity to continue to build on success.

QUESTIONS

THANK YOU

Adebola Osewa, DNP(c),PMHNP-BC, FNP-BC, RN

www. Foresthills.northwell.edu

AOSEWA@NORTHWELL.EDU

REFERENCES

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The Joint Commission. (2023). National Patient Safety Goals. https://www.jointcommission.org/standards/national-patient-safety-goals/

Appendix D

Bariatric Acronym Revised Discharge

Long Island Jewish Forest Hills
Northwell Health

Dr. Jessica Folek and Dr. Dimitar Ranev
Long Island Jewish Forest Hills
Phone (718)830-4093 or (718) 575-9595, Fax (718)830-1149

BARIATRIC DISCHARGE INSTRUCTIONS

DIET AND NUTRITION:

- **Day 1-2 after surgery:** clear liquids- Broth, water, tea, sugar-free ice pops.
- **Day 1-2 through 2nd week:** Protein shakes, milk, smooth yogurt, thin soups, sugar-free pudding
- **Your fluid intake goal is 64 oz. fluid per day. Sip fluid every 15 minutes.**
- **Your protein intake goal is 70-100 gm of protein per day**
- **No carbonation! No caffeine! Do not drink from a straw.**

ACTIVITY: WALK! You should be out of bed and walking as much as possible. Plan to walk every day for at least 15-30 minutes. NO HEAVY LIFTING (10 lbs. or more) for four weeks. Continue to use the incentive spirometer you receive in the hospital.

WOUND CARE:

- OK to shower normally. Allow soap and water to run over the wounds. Do not scrub wounds. If you have plastic bandages or Band-Aids on the wounds, remove them two days after surgery.
- Do not remove the tape strips that are directly on the skin.
- Do not soak in a bathtub, swimming pool, or hot tub for at least four weeks.

MEDICATION CHANGES:

- **Prescriptions:** You will get prescriptions for anti-acid (omeprazole), nausea medication (Zofran), and pain medication (Tylenol) at your preop visit. If indicated, you may also be prescribed blood thinning medication (Eliquis). Please pick up medications prior to surgery.
- If these prescriptions have not been sent to your pharmacy, please let us know!

Crush or cut up your large pills! OK to take pills the size of a Tic-Tac or smaller unless extended release

- **Extended–release medications** can't be crushed (i.e., XR, SR, CR) and need to be changed. Discuss this with your PCP or surgeon before you leave the hospital.
- **Antacid:** you will be prescribed antacid medication daily for 30 days after surgery. This comes in capsule form. If you had a gastric bypass, the capsule needs to be opened for you to take.
- **Vitamins**: start taking your vitamins as soon as you get home from surgery. These should be chewable or dissolvable. Avoid the "gummy" vitamins.
- **Diabetics:** check your blood sugar regularly. If you have questions regarding your diabetic medications, speak to your PCP or provider managing your diabetes.
- **Meds to avoid**: Do not take anti-inflammatory pain medications such as ibuprofen, Advil, Aleve, or Naprosyn unless discussed with your surgeon. You **CAN** take Tylenol.

FOLLOW-UP APPOINTMENTS:

- **Surgeon:** within 7-10 days after surgery
- **PCP:** within 1-2 weeks after surgery to review and adjust your medications

Long Island Jewish Forest Hills
Northwell Health℠

WARNING SIGNS

If something doesn't feel right, call us!
If you need to go to the emergency room, return to the LIJ Forest Hills ER where you had surgery.

DEHYDRATION:
Symptoms of dehydration include dizziness when standing up, dry mouth, fatigue, and dark-colored urine. **Your goal is at least 64oz of fluid per day. To reach this goal more easily, sip fluids constantly- 1oz every 15 minutes. If you become dehydrated and can't catch up with your fluid intake, please call your surgeon.**

WARNING SIGNS to call for:

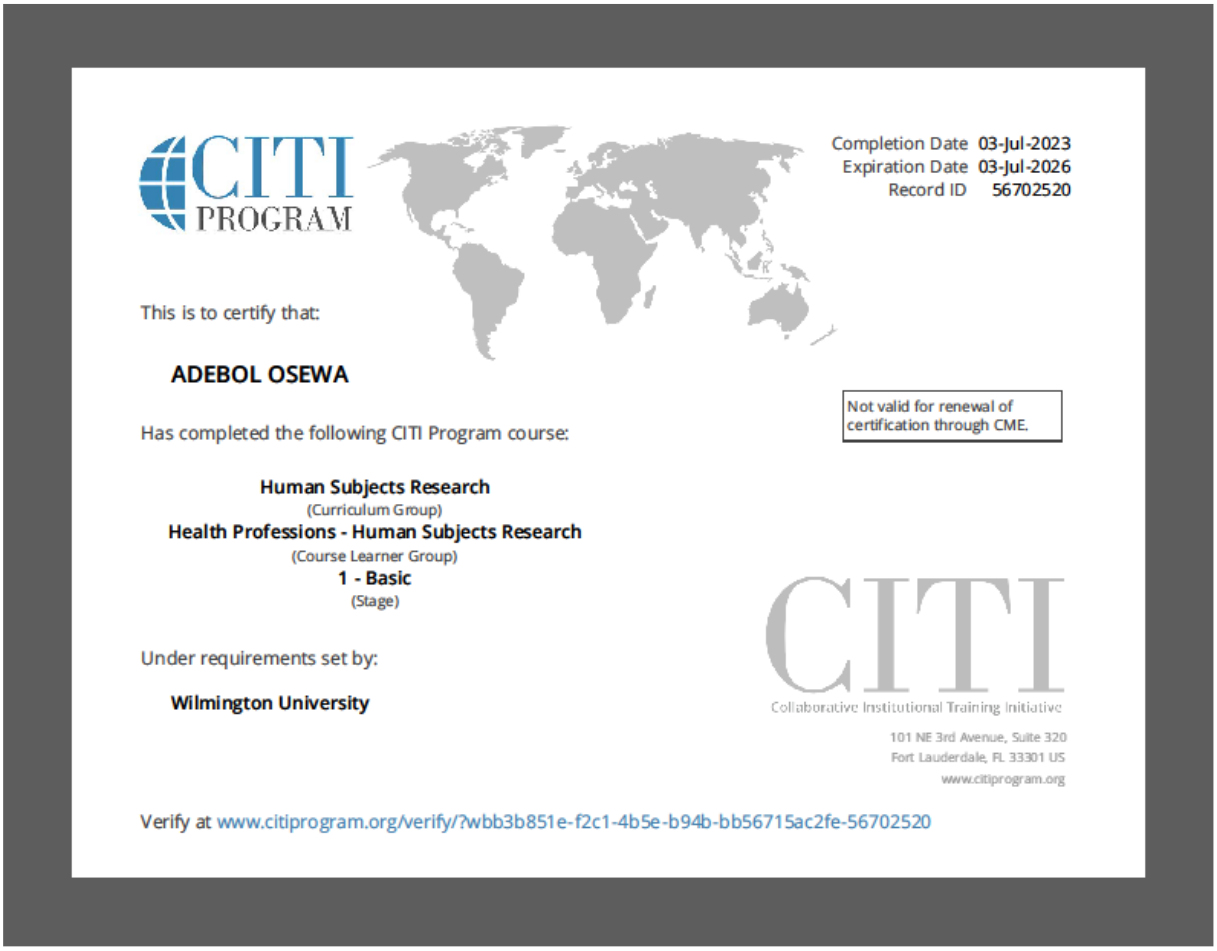
- Fever ≥ 101 ° F
- Heart rate consistently ≥ than 110 beats per minute
- Severe nausea or vomiting lasting more than 2 hours
- Worsening abdominal pain that is not relieved by pain medication
- Shortness of breath or chest pain
- Constipation (if no bowel movement by third day after surgery) see below
- Redness, drainage, or significant pain at the incision sites

CONSTIPATION:

- You may not have a bowel movement for up to 3-4 days after surgery. This is common.
- The most important cure for constipation **is to drink plenty of liquid-at least 64 ounces per day**
- Walking frequently can also help with constipation
- Avoid narcotics: Narcotic pain medication (oxycodone, hydrocodone, etc.) can worsen constipation. If you need to take pain medication, take acetaminophen (Tylenol)
- Medications: If you have not had a bowel movement by day 3 after surgery, start Colace 100mg three times daily. If you do not have a bowel movement in 4-5 days after surgery, add a laxative such as Dulcolax/MiraLAX or a Dulcolax suppository. If these do not work, try Milk of Magnesia. Follow the instructions on the bottle. This can be dehydrating, so be sure to maintain hydration as close to the goal as possible.
- If the above do not work, call your surgeon.

Appendix E

CITI Certification


CITI PROGRAM

Completion Date 03-Jul-2023
Expiration Date 03-Jul-2026
Record ID 56702520

This is to certify that:

ADEBOL OSEWA

Not valid for renewal of certification through CME.

Has completed the following CITI Program course:

Human Subjects Research
(Curriculum Group)
Health Professions - Human Subjects Research
(Course Learner Group)
1 - Basic
(Stage)

Under requirements set by:

Wilmington University

CITI
Collaborative Institutional Training Initiative
101 NE 3rd Avenue, Suite 320
Fort Lauderdale, FL 33301 US
www.citiprogram.org

Verify at www.citiprogram.org/verify/?wbb3b851e-f2c1-4b5e-b94b-bb56715ac2fe-56702520

Appendix F

Quality Improvement Site Approval Letter

Long Island Jewish Forest Hills
Northwell Health

Department of Surgery

QI APPROVAL LETTER

Wilmington University
320 North DuPont Hwy
New Castle DE, 19720

Subject: DNP QI Project Approval Letter

To whom it may concern:

This letter acknowledges that I have received and reviewed a request by Adebola Osewa NP, to conduct a Quality Improvement project entitled "Bariatric ERAS based medication reconciliation discharge process" at Long Island Jewish Forest Hills Hospital. I approve of this quality improvement project to be conducted at our facility.

When the DNP candidate receives approval for her QI project from the Wilmington University's Human Subject Research Committee, I agree to provide access for the approved QI project. If we have any concerns or need additional information, we will contact the Wilmington University's Human Subject Research Committee at 877-967-5464/ humansubjectsresearch@wilmu.edu.

Sincerely,

Jessica Folek MD, FACS, FASMBS, DABOM
Director of Bariatric Surgery LIJ Forest Hills Hospital
jfolek@northwell.edu
718-830-4093