Chemotherapy Instruction Improvement Project

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Chemotherapy Instruction Improvement Project

by

Lori A. Lelii

MS, University of Cincinnati, 2009
BS, Neumann University, 2004

Project Submitted in Fulfillment
of the Requirements for the Degree of
Doctor of Nursing Practice

University of New Mexico College of Nursing
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Abstract

Purpose
The project aimed to evaluate nursing satisfaction after implementing a standardized chemotherapy patient education program. The project tracked patient satisfaction scores on the Press Ganey® survey to identify changes.

Rationale/Background
Patients receiving chemotherapy for the first time have significant educational needs. Nurses are concerned about their patients because of the complexity of chemotherapy treatment and potential for complications related to inadequately managed side effects. There is limited information available to guide nurses on best approaches to prepare clients for chemotherapy.

Theoretical framework
This project was conducted using a Plan, Do, Study, Act approach under the modern change theory.

Methodology
Over 70% of the staff nurses attended a live accredited nursing education session aimed at standardizing the education process. The project leader examined 35 pre- and 33 post-implementation four point Likert surveys completed by chemotherapy-certified registered nurses. Results were analyzed using the Mann Whitney U test. Press Ganey® scores were assessed for changes at 6 months post-implementation.

Outcomes Achieved
The analysis of the surveys indicated statistically significant improvement in “the chemotherapy education process is consistent and standardized” ($p = 0.04$), and
“my job satisfaction is positively affected by the current chemotherapy education process” ($p = 0.05$). A small improvement occurred in Press Ganey® scores.

**Conclusions**

This project provides an example of the positive effects on nursing when a health care institution prioritizes consistent and standardized patient education. Patient satisfaction may further improve with additional interventions.

**Keywords:** Chemotherapy education, patient teaching, nursing satisfaction, patient satisfaction, oncology nursing
Dedication

I dedicate this project to my village of family, friends, classmates, faculty, co-workers, preceptors, and patients. Every one of you played an integral role in helping me to get to this point and I am forever grateful.

To my parents, Dreama and Jim, thank you for always pushing me to take the extra step and for supporting my decision to move so far way to grow in my profession. To my husband, Joe, thank you for your help at home and for your constant cheering me up and cheering me on when I needed it. To my children, Marissa, Nico, and Alayna, you have had very little time in your lives that I was not a student. You always supported me and as you grew older, you helped me in so many ways, from proofreading to IT help. To my daughter-in-law Fernanda, thank you for being an amazing wife to my son, and daughter and friend to me. Thank you for really pushing me to do this. To my brother-in-law, Jim, you have been with me for a large part of my school journey as well. Thank you for helping me with the kids in the early years, and for making sure we were all fed these last two years. To my classmates Nicole, Menorah, Maria, and Bobby, although our entire class is very close, I feel a special connection to each of you, and I am so happy that we have formed such incredible bonds throughout this journey. To Dr. David J. Maleh, thank you for your guidance, encouragement, and friendship over the years. I never told you this, but something you said in 2014 gave me the drive to go back for my FNP. That conversation put me on the path that led me here. To Suzanne Gagnon, thank you for being a constant source of encouragement and guidance over the last few years. To Dolly, for taking care of Nico when I had to transition to day classes for my undergrad
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List of Abbreviations

CHIP  Chemotherapy Instruction Improvement Project
CNE   Continuing Nursing Education
HCAHPS Hospital Consumer Assessment of Healthcare Providers and Systems
NCI   National Cancer Institute
PDSA  Plan, Do, Study, Act cycle
CHAPTER ONE: INTRODUCTION AND BACKGROUND

A Cancer Diagnosis

Receiving a new diagnosis of cancer is a life-changing event. The diagnosis brings feelings of anxiety, uncertainty about the future, and fear of mortality. A cancer diagnosis can bring a change in family roles. Treatments can be complicated and, according to the National Cancer Institute (NCI; n.d.), may include one or more of the following: surgery; chemotherapy; radiation; hormonal, targeted, and precision therapies; immunotherapy; and stem cell transplant. These are not only difficult; they are also potentially dangerous and have side effects that can range from fatigue to neutropenic fever and organ-related inflammation, and these issues need management (NCI, n.d.). These treatments cause a great deal of anxiety for patients and caregivers (National Comprehensive Cancer Network, 2020). Patients receiving chemotherapy for the first time have significant learning needs on topics ranging from treatment options and home management to survivorship (Blecher et al., 2016).

Nurses typically have the task of educating patients about their chemotherapy regimen. This education usually takes place just before the first treatment. Topics covered include the regimen itself, scheduling appointments, side effects, symptom management, and symptoms that require immediate medical attention (Jabaley et al., 2020). Nurses recognize the importance of chemotherapy education and would like to ensure that they can adequately meet each patient's needs; however, they often express frustration and concern that the process is ineffective and inefficient. They are concerned that patients may fail to seek treatment for symptoms that need urgent treatment due to a lack of
understanding, leading to potential treatment-related complications (Scott et al., 2019). However, if patients fully understand the management of these side effects, they can safely care for themselves at home and remain on course with their treatments. One way to accomplish this is to standardize the way nurses deliver chemotherapy education to patients. Nurses will know what information to cover and will provide the information in the same manner. Standardization will potentially decrease confusion for nurses, patients, and caregivers. Standardizing the way chemotherapy education is delivered may increase nurse satisfaction, patient understanding, and patient satisfaction (Dalby et al., 2013).

**Understanding Cancer Treatment**

Cancer is a significant health problem in the United States. The Cancer Statistics Center (2018) of the American Cancer Society estimated 1.8 million cases were diagnosed in 2020. In New Mexico alone in 2020, physicians diagnosed an estimated 9,800 new cases (Cancer Statistics Center, 2018). There is no perfect approach to managing patients with cancer, and meeting their various needs requires an interdisciplinary team of professionals. One crucial aspect of cancer care linked to outcomes and satisfaction is chemotherapy education. Patients and caregivers must have a solid understanding of chemotherapy treatment and the management of side effects. Having a clear understanding significantly impacts how well-equipped patients are to comply with their treatment and manage their side effects (Kean et al., 2016).

According to my findings in this research and anecdotes from my personal experience, infusion center or bedside nurses most often give chemotherapy education. This education can occur at a separate appointment a few days before or immediately
before administering the first treatment in the outpatient setting. Nurses provide patients and caregivers with information via verbal instructions and written handouts. Each nurse has an individual teaching style and conveys information differently (Gallegos et al., 2019). Some chemotherapy nurses express that they are unsure of what information they should cover and how to explain symptom and side effect management (A. Cox, personal communication, January 24, 2020). They are also concerned that time constraints contribute to ineffective teaching. While chemotherapy education is a part of a patient’s appointment, nurses are simultaneously responsible for the care of other patients.

This is the case in a cancer treatment facility that is the focus of this project. It is in a cancer center at a university in the U.S. Southwest. Chemotherapy nurses in this facility frequently worry that educating patients and caregivers immediately before administering chemotherapy is neither practical nor efficient. According to the nurse leader, “staff chemotherapy nurses commonly say that by the time the patients complete their lab testing and a visit with the oncologist and present for their chemotherapy education and treatment, they are exhausted, anxious, overwhelmed, and are less likely to retain the information presented to them” (A. Cox, personal communication, January 24, 2020). One triage nurse reported that a large part of what she does daily involves addressing symptom management questions. She also provides additional education when patients call with questions or other problems within 5 days of receiving their first chemotherapy dose (E. Espinoza, personal communication, January 7, 2021).

Ensuring that patients comprehend this information is essential for patient safety, optimal outcomes, and patient satisfaction. This university cancer facility places a
tremendous amount of importance on patient satisfaction scores from the Press Ganey® Survey. According to Press Ganey® (2015a), over 41,000 hospitals and other healthcare facilities utilize the Press Ganey® survey as a tool to identify what they are doing well and what areas need improvement. Furthermore, Press Ganey® (2015a) states that facilities that use their surveys tend to score higher in the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) database. HCAPHS scores are important because they are available to the public. HCAPHS scores are a quality metric used to determine value-based reimbursement (Centers for Medicare & Medicaid Services, 2020). Press Ganey® scores at the university cancer center suggest that the nurses’ observations and concerns may be valid. The facility’s Press Ganey® ranking for “explained management of chemotherapy side effects” has been consistently at or below the 22nd percentile compared to national scores for 2019 and 2020. These results mean that 78% of facilities surveyed in the United States ranked higher in this area, which indicates a need for improvement. The benchmark ranking for this question is the 50th percentile.

**Project Purpose and PICOT Question**

This project, the Chemotherapy Instruction Improvement Project (CHIP), aimed to improve chemotherapy nursing and patient satisfaction and to improve patients’ understanding of chemotherapy side effects by restructuring how nurses deliver chemotherapy education at a university cancer center in the U.S. Southwest. Nursing leadership at the facility supported a plan to standardize the chemotherapy education process (A. Cox, personal communication, January 24, 2020). Patients have typically
been given verbal instructions with handouts just before receiving their first dose of chemotherapy. According to Blecher et al. (2016), verbal instruction with handouts alone may not be enough. Based on my literature review, I believe that restructuring how chemotherapy education is delivered will help nurses feel better prepared to provide the pertinent information and give patients a better understanding of what side effects to expect and how to manage them. My assumption in this project was that standardizing the chemotherapy education process would improve nurses’ satisfaction by at least 12.8%. In a study by Gallegos et al. (2019), a 12.8% change indicated by a nursing staff satisfaction survey showed statistical significance ($p = 0.03$). Furthermore, I assumed that standardizing the chemotherapy education process would also increase patient satisfaction, as evidenced by improved Press Ganey® scores over 3 months. The PICOT question guiding this study was: Among (P) chemotherapy-certified registered nurses, will (I) a standardized chemotherapy education process, as opposed to the (C) current verbal instruction with handouts, lead to (O) increased nursing satisfaction (T) over 3 months?
CHAPTER TWO: REVIEW OF LITERATURE

To examine the issues surrounding chemotherapy education, nursing, and patient satisfaction, I performed a literature review using the keywords *standardized education, chemotherapy, oncology, cancer, outpatient, ambulatory, patient satisfaction and nurse satisfaction, and quality improvement* in CINAHL, OVID, and PubMed databases. Articles were limited to publication dates between 2008 and 2020, the adult population, and the English language. International studies reviewed did not meet the inclusion criteria for this literature review. Methods to improve patient education included in this review were standardizing the education process, holding an educational class for nurses, holding general chemotherapy classes for patients, altering the timing of education, calling patients back within a specified period, and using the teach-back method.

**Standardized Chemotherapy Education Process**

Gallegos et al. (2019) conducted a study of cancer patients and nurses in a rural U.S. outpatient cancer center. The patients studied were adult men and women with an average age of 60 years. The research team implemented several interventions to improve the timing and methods of educating patients. They developed a general group chemotherapy class that reviewed chemotherapy basics for patients about to enter treatment. The researchers also created a chemotherapy teaching checklist to ensure that staff members covered all the essential aspects of chemotherapy treatment and side effect management. The nursing staff used the checklist during each patient’s one-on-one education session before the first treatment. Nurses thoroughly reviewed the materials provided to patients and revised and condensed the materials to prevent information
overload for the patient. In addition to these interventions, the team devised a template for the electronic medical record and documented education reinforcement. Before initiating these measures, all nurses and pharmacists attended a mandatory training class to learn the new standardized process. New staff participated in the class during onboarding. The research team invited physicians to participate in these sessions and be apprised of the new process. They were included in the decision-making process and informed of sources for written material and expected outcomes. Gallegos et al.’s (2019) study made no mention of the content, delivery, or evaluation of the education. Their project assessed both patient and nursing satisfaction with the standardized education process.

The researchers measured the effectiveness of the intervention using a pre- and post-implementation questionnaire and surveyed both adult cancer patients and chemotherapy-certified nurses. The nurses’ satisfaction questionnaire asked about efficiency, time spent on patient education, and job satisfaction. The patient satisfaction questionnaire asked how prepared patients felt to manage their side effects and know when to call, as well as their levels of anxiety and satisfaction. Descriptive statistics on both study populations were analyzed using Student’s t-test and analysis of variance tests. The threshold for statistical significance was \( p < .05 \). This study revealed a 26.5% improvement \( p < 0.001–0.03 \) in nurse satisfaction among all areas examined; however, there was no significant statistical change \( p = 0.1–0.79 \) concerning patient satisfaction items. This study’s limitations included small sample size and lack of demographic data.
regarding race and ethnicity, making generalizability difficult. Another limitation was the lack of validity and reliability of data with the questionnaires.

In another study, Kean et al. (2016) examined their patient education program’s efficacy using a cross-sectional survey. They conducted a study with 41 adult oncology patients from 18 to 89 years of age. Most of the patients had at least a high school diploma or GED. Patients received instructions about preparing for their chemotherapy treatment on the same day as the oncologist’s consultation. Staff instructed patients on the time and place to report and gave reminders about the medications patients would need to take or hold on their chemotherapy day. Some patients must take antiemetic medications and or steroids the day before and the morning of chemotherapy to prevent nausea and vomiting (Olsen et al., 2014). On the first day of chemotherapy, nurses and pharmacists taught patients about the treatment regimen and side effects, as well as how to manage them at home. The nurses gave information about medications that were to be used at home to manage treatment-related symptoms. Patients received this material both verbally and in writing. Using a Likert scale, patients answered questions about prior chemotherapy treatment, information they had received at their consultation visit, and whether they felt the education provided was sufficient to meet their needs. While Kean et al. (2016) did not mention writing or literacy issues; they did state that only one patient had less than a high school diploma or GED.

Patient education using the teach-back method was the subject of Scott et al.’s 2019 study in a rural hospital in the U.S. Southeast. They utilized information from the U.S. Census Bureau to identify populations at high risk for low health literacy, including
Hispanic and African American populations, along with residents aged 65 and over living in rural communities. Scott et al.’s study also evaluated the nursing staff’s understanding of the teach-back method as well as trending Press Ganey® scores three months pre and post teach-back education intervention. The results of Scott et al.’s study showed an increase in nursing confidence in delivering education using the teach-back method as well as an improvement in patient satisfaction and comprehension of discharge instructions.

Kean’s study (2016) also looked at other questions such as how likely participants would be to watch an education video and how useful a follow-up phone call would be to them. Over half of respondents rated a follow-up phone call as very useful, and 31% rated their likelihood of watching an educational video as very likely. Patients were able to leave free text comments and feedback on the surveys. One statement read, “I do not remember anything, this is all a blur,” and another read, “You should ask patients how they want to get information before you give it” (Kean et al., 2016, p. 366). This project’s limitations included small sample size and potential changes in patients’ cognition; some patients received medications that could cause mild sedation, which may have affected their comprehension of information and survey responses (Kean et al., 2016). While the authors did not mention these medications explicitly in this study, common sedating medications given before chemotherapy can include Benadryl®, Zyprexa™, and Ativan® (Olsen et al., 2014).

A group of oncology nurses at the Dana-Farber Cancer Institute, a cancer treatment and research facility in Boston, Massachusetts, developed a program to
streamline the way patients received chemotherapy education (Dalby et al., 2013). They examined the effect of a standardized chemotherapy education approach on both nursing and patient satisfaction. The team aimed to achieve a 95% patient satisfaction score on Press Ganey® questions regarding knowing what to expect with chemotherapy and side effect management. The baseline scores in these areas were 91% and 87%, respectively. The researchers used a cross-sectional survey design with 53 patients and 23 nurses. A team of oncology nurses, nurse practitioners, physician assistants, and pharmacists created a standardized checklist to ensure nurses knew what to cover in the education sessions with patients. The checklist included cues to review information on what to expect, preferred pharmacy, and allergies. There were also cues to discuss the therapy regimen, side effects, clinic contact information, reportable symptoms, and a list of resources for additional information, such as the American Cancer Society and National Cancer Institute websites. The team developed and used specialized treatment calendars and information regarding managing side effects and calling for medical advice. Patients filled out a survey at the third infusion about their experiences.

Dalby et al. (2013) analyzed Press Ganey® scores and the post-education surveys to determine outcomes. Outcomes showed a 4% increase in knowing what to expect with chemotherapy and a 10% increase in knowing how to manage side effects. Before implementing the new education, patients rated their knowledge of what to expect with chemotherapy at 91% and knowledge of side effect management at 87%. Four months after implementation, scores rose to 97% in both categories. Dalby et al. (2013) did not run formal statistics, but this change implies clinical significance. Facility oncology
nursing staff took an online survey and 23 members responded. Of the respondents, 88% found the new checklist to be helpful, 100% felt the materials provided were comprehensive, and 80% felt the follow-up teaching materials were useful (Dalby et al., 2013). The limitations of this study were small sample size, lack of demographic data, and unstandardized timing of the chemotherapy education across all satellite offices in the study setting. The team used the Press Ganey® survey and the investigator survey to measure the effect of the new process. Since healthcare facilities send the Press Ganey® to all patients, and only study patients completed the surveys, it is hard to know just how much the new process affected the Press Ganey® scores. Furthermore, patient satisfaction involves several components that were not controlled for in this study.

Portz and Johnston (2014) performed a quality improvement pilot project in a community based multi-site cancer center located in the U.S. Midwest. They evaluated their entire education workflow process, citing as the driver nurses’ reports of difficulty managing the teaching session and simultaneously having the responsibilities of patient care. Nurses also had concerns that patients were too overwhelmed and anxious, making it challenging for them to comprehend the depth and detail of the information provided (Portz & Johnston, 2014).

The study team consisted of an outpatient and inpatient nurse manager, a clinical nurse specialist, a nurse practitioner, a nurse educator, and seven frontline nurses. The team performed patient teaching at a separate appointment before the first chemotherapy treatment, followed by a follow-up phone call 48 to 72 hours after the first chemotherapy treatment, a change from their usual process. They also used standardized, evidence-
based patient education with scripting to help nurses know what to say regarding symptom management. This information came from the American Cancer Society’s Personal Health Manager Kit: Be a Survivor (American Cancer Society, 2021) treatment guide. The team organized these resources and devised a teaching script to provide information in a standardized way. Their project included five 1-hour education sessions for the medical oncology nursing staff. During these sessions, the team reviewed and updated the education script, ensured each member understood their role in the education process and what documentation to complete, and reviewed the most current patient resources.

Portz and Johnston’s (2014) study outcomes only revealed anecdotal reports by treatment nurses of increased patient satisfaction and nursing satisfaction. Barriers in this project included difficulty pulling a staff nurse away from the treatment floor to give one-on-one education, especially on high census or high acuity days. A lack of statistical measurements, demographic data, a small sample size of nurses ($n = 25$), and completion of only eight of ten separate patient visits were also limitations. The authors did not provide the education script, which is another limitation. Their preliminary findings warrant further investigation, statistical analysis, and detailed reporting.

**Web-Based and Smartphone Chemotherapy Mobile Applications**

Several mobile applications are available to assist patients with managing their cancer symptoms. They are available for iPhone in the Apple App Store and for Android devices in Google Play. ChemoWave (Treatment Technologies & Insights, Inc., 2019) helps patients manage their medications and track symptoms. An upgraded version,
ChemoWave Pro, is available by subscription for a nominal fee, currently $4.99 per month. My Cancer Coach (Genomic Health, Inc., 2021) is another phone app developed with the team at breastcancer.org. It provides videos and links to resources that patients may find helpful and a calendar for keeping track of appointments, along with a journal with photo and audio capabilities for keeping track of thoughts and symptoms. This app offers a list of suggested questions for patients to ask their physicians regarding their care plan, and it offers an interdisciplinary coaching team, including a registered nurse. The app Belong: Beating Cancer Together (belong.life, 2020) is a social network for patients, families, and caregivers. This web and phone app is also free. Patients can search for clinical trials, manage and share records, and provide tips from various social network members. Belong.life has reputable partners such as the NCI and employs Dr. Daniel Vorobiof as its medical director. Dr. Vorobiof is a well-known and respected oncologist and was the founder and medical director of the Sandton Oncology Centre in Johannesburg, South Africa from 1989 to 2018 (Piana, 2019).

These apps may provide some assistance to some patients with organization and tracking of symptoms, medications, and appointments. However, according to the NCI (2020), a newly diagnosed cancer patient’s median age is 66 years, with 91% of cancer patients being at least 45 years old. While many patients in this age group may have access to smartphones, they may not be well versed in all the functions of smartphones. People in this age group are known as “digital immigrants” (Prensky, 2001). Digital immigrants are a population born before 1980 before the widespread use of computers and the internet, who likely have difficulty using technology. In a survey of 101 patients
at the university cancer clinic where this project took place, only about 30% were comfortable using their phone to scan a Quick Response (QR) code. QR codes are a type of barcode that can be scanned using a mobile phone’s camera to bring up a specific website, or in this case, access to the survey. The survey administrator offered patients without smartphones an Apple iPad to take the survey (B. Tawfik, personal communication, July 7, 2020). The remaining 70% of patients were willing to take the survey but asked for a paper version.

Measuring Teaching Effectiveness

A study by Akbari et al. (2016) used the Kirkpatrick Model™ to evaluate the effectiveness of a cardiopulmonary resuscitation (CPR) training for nurses that took place in an Iranian hospital. The researchers’ literature review found that very few training programs undergo evaluation in Iran. However, the few that evaluated education programs used the Kirkpatrick Model™, but only at the first two levels: reaction and learning. Akbari et al. (2016) evaluated the hospital’s CPR training program for nurses and aides at all four Kirkpatrick Model™ levels, and they found positive results at all four levels. The researchers also found that surveying the Kirkpatrick Model™’s behavioral index was “difficult and time-consuming” (Akbari et al., 2016, p.497), though they did not elaborate how so.

The Kirkpatrick Model™ has been in use worldwide since the 1960s and is considered the standard method to evaluate education and training programs in business and healthcare. To measure the outcomes of a program and participants’ application of knowledge gained, the model evaluates participants’ knowledge and behavior at four
levels: reaction to education provided (level 1), learning (level 2), behavior (level 3), and results (level 4; Kirkpatrick Partners, 2009). Several researchers have found the Kirkpatrick Model™ to be an effective way to measure education activities in nursing and healthcare (Akbari et al., 2016; Bhatia et al., 2021; Maddineshat et al., 2018; Smidt et al., 2009; Yoon et al., 2016). The Kirkpatrick Model™ is also the education evaluation model currently in use at a local hospital organization. (R. Frija, personal communication, December 11, 2020). Considering that the Kirkpatrick Model™ is a long-standing and proven method of evaluating education in healthcare, it is the method of choice to assess standardizing chemotherapy education for oncology nurses and patients.

Summary

Providing patients with chemotherapy education they can understand, retain, and comply with is instrumental in helping them through their cancer treatment. This responsibility most often lies with chemotherapy-certified registered nurses, and the timing is generally just before the first treatment. Utilizing standardized methods of educating chemotherapy patients has essential benefits, such as increasing patients’ level of understanding, improving confidence in managing side effects at home, increasing patient satisfaction, and increasing nursing satisfaction (Dalby et al., 2013; Gallegos et al., 2019; Kean et al., 2016). Chemotherapy-certified registered nurses at the cancer center that hosted this project voiced frustration with the current patient education process (C. Okino, personal communication, February 18, 2020). For these reasons, implementing a standardized chemotherapy education delivery process can be beneficial to both patients and chemotherapy-certified registered nurses.
CHAPTER THREE: THEORETICAL MODEL AND METHODOLOGY

Theoretical Model

Considering reports of nurses feeling concerned and frustrated with the current chemotherapy education process at the university cancer center in this project and seeing how its Press Ganey® scores are below the national benchmark, some change in their current process may prove beneficial for stakeholders. Modern stage theory is an adaptation of Lewin’s (1951) three-stage change model and Roger’s (1962) diffusion of innovations theory (Butterfoss et al., 2008). Lewin’s (1951) model has three stages: unfreeze, change, and refreeze. Rogers’s (1962) theory has four elements: (a) an innovation or idea is (b) spread through communication, (c) over time, (d) to members of a particular group. The modern stage theory (Butterfoss et al., 2008) combines these ideas into four stages: (a) recognizing a problem and (b) identifying potential solutions, (c) adopting an intervention, implementing the intervention, and (d) adopting the intervention as a part of the organization's operation.

The CHIP project aligned with modern stage theory. The project team identified a problem with the patient education process (stage one). They expressed a desire to institute a new technique for promoting consistent communication between staff and patients (stage two). The team implemented the standardized process (stage three). If the new process resulted in nurse and patient satisfaction, the infusion center would adopt the new process (stage four).
**Project Description**

CHIP was a quality improvement project that the investigators implemented using the Plan Do Study Act (PDSA) model. The PDSA cycle began as the Plan Do Check Act cycle, which Walter Shewart (1939) developed as a basis for organizational development and leadership (Act Academy, n.d.). W. E. Deming (1986) further developed this model into the PDSA. CHIP evaluated chemotherapy infusion nurse satisfaction after restructuring how chemotherapy-certified registered nurses deliver chemotherapy education. Project participants completed an eight-question Likert scale survey about their feelings regarding the current chemotherapy education practice; they then attended an education session addressing the components of comprehensive, standardized chemotherapy education for first-time patients. Gallegos et al. (2019) first published the survey used in CHIP and granted permission for its use in this project (R. Gallegos, personal communication, November 9, 2020). Participants in the education activity earned 1.0 Continuing Nursing Education (CNE) Credit, approved by the state nursing association for 2 years as long as they took a post-test and evaluated the education activity. CHIP investigators hoped the nurses who participated in the education activity would also voluntarily complete the pre-and post-surveys. Three months post-intervention, participants completed the survey again. Participants accessed the surveys via REDCap®, a secure web application. Upon completion of data collection, the investigators analyzed the results using the Mann-Whitney U test to measure the process change’s effectiveness. To measure how this new process affected patient satisfaction,
investigators followed Press Ganey® scores monthly for 6 months following the intervention.

**Setting and Resources**

CHIP took place at a university-affiliated cancer center in the U.S. Southwest in the chemotherapy infusion department. Project participants—chemotherapy-certified registered nurses—attended a live, accredited, 1-hour education session addressing the components of comprehensive, standardized chemotherapy education. These components were adapted from a checklist published by a national oncology center (Dalby et al., 2013). Prior to the education, chemotherapy-certified registered nurses who participated completed a consent form and a secure REDCap® web-based pre-test survey. The unit’s nurse leader sent the survey link to the entire nursing staff via email. This email requested that those who participated in the continuing education complete the post-test 3 months after the intervention to measure satisfaction with the standardized process, time spent on education, resources available, and comprehensiveness of the education program (see Appendix A). After completing a second consent form, each nurse accessed the post-test survey. The investigators evaluated Press Ganey® scores to the item “explained management of chemotherapy side effects” at month 6 to assess change from baseline.

**Table 1**

*Timing and Activity of CHIP*

<table>
<thead>
<tr>
<th>Month 1</th>
<th>Month 2</th>
<th>Month 3</th>
<th>Month 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>Synchronous and asynchronous education activity</td>
<td>Encourage unit nurses to apply new patient education structure using an adapted checklist</td>
<td>Post-test</td>
</tr>
</tbody>
</table>
The unit nurse leader shared the Press Ganey® survey results for the item “explained management of chemotherapy side effects” from January 2021 through December 2021. This time frame gave 6 months of data before the intervention and 6 months of data post-intervention. The nurse leader sent the results to the project investigators via secure institutional email. Project investigators destroyed the pre- and post-survey results and the Press Ganey® results upon completing this project.

**Project Participant Population**

The project’s participant population consisted of chemotherapy-certified registered nurses working at the university-affiliated cancer center. The infusion unit’s nurse leader invited the student investigator to present the education activity during a chemotherapy-certified registered nurses’ meeting. She forwarded an email to nurses using the institution’s secure email system (see Appendix A). The clinical operations director expressed support of this quality improvement initiative and requested an invitation to attend the education activity (see Appendix B). All chemotherapy-certified registered nurses were eligible to participate in this project. Participation was voluntary. As a measure to recruit as many of the unit’s chemotherapy-certified registered nurses as possible, the chemotherapy-certified registered nurses were eligible to register for the Chemotherapy Instruction Review course and receive 1.0 CNE credit from the state nursing organization with a 2-year expiration (see Appendix C). The chemotherapy-certified registered nurses who participated and met the CNE criteria received their certificates after the activity. The student investigator will keep the attendance records on a password-protected laptop for 6 years, as required by the state nursing association, and
destroy them afterward. The chemotherapy infusion unit’s nurse leader sent a secure institutional email to the department’s registered nurses for recruitment (see Appendix D). The chemotherapy-certified registered nurses voluntarily participated in the post-test survey upon completing a consent form, which enabled them to access the REDCap® survey. To analyze any change in patient satisfaction because of the process change, the investigators also followed the facility’s Press Ganey® scores monthly for 6 months following the CNE activity presentation.

Multiple factors may have influenced the outcome of CHIP. These include education level and nursing background of participants, participants’ total years of experience in nursing and number of years of experience in oncology, participants’ hours worked per week as well as personal or family history, and the number of nurses who ultimately choose to participate in all aspects of the project (i.e., pre- and post-test nursing satisfaction survey completion and education activity participation). Environmental factors that may have contributed to the project’s outcomes include modifications to the workplace due to the ongoing COVID-19 pandemic, such as wearing masks and social distancing. The student investigator held the live education activity in the Zoom videoconferencing format due to social distancing requirements. The number of Press Ganey® surveys received may have affected the outcome of the patient scores.

Sources of Data

Data came from pre- and post-implementation nursing satisfaction surveys that the unit’s chemotherapy-certified registered nurses took via REDCap®. Project participants received an email on their nursing unit listserv address through the secure
institution-based email with a link to the REDCap® system to consent and complete the secure, anonymous surveys. The infusion unit’s nurse leader expressed support for this project and agreed to share the Press Ganey® results with the student investigator (see Appendix A). The infusion unit’s nurse leader sent the results for January 2021 through December 2021 to the project investigator via the secure institution-based email.

Data Analysis

The project’s student investigator analyzed data over 6 months. The evaluation plan included criteria to evaluate project steps that worked or did not work in order to determine the next steps and recommendations. The student investigator collected data via a REDCap® survey. The project investigator and student investigator analyzed scores to determine baseline and monthly changes for 6 months post-intervention. No personal identifying information was included in the Press Ganey® survey reports. When patients filled out their surveys online, Press Ganey® used encryption and firewalls to protect personal information (Press Ganey®, n.d.b). The pre- and post- nursing satisfaction surveys did not collect any personally identifying data from project participants (see Appendix E).

There are 40 chemotherapy-certified registered nurses employed in the facility’s chemotherapy infusion unit (C. Okino, personal communication, August 19, 2020). With 83% total sample size, the student investigator and statistician evaluated results using a non-parametric Mann-Whitney U test to analyze the data (Stommel & Dontje, 2014). Project investigators also used descriptive statistics such as nursing education level,
number of years of nursing experience, number of years of oncology experience, and number of years employed with the cancer center.

**Quality**

The project implementation and data collection were feasible, practical, and determined to be appropriate for the clinical setting with oncology infusion nurses, as indicated by letters from the facility’s nursing director and leadership. The live synchronous and asynchronous enduring options for participating in the nursing CEU were amenable for clinical settings. The surveys were owned by the project manager, who had access to the system, served as the principal investigator, and granted access to the student investigator within the REDCap® database—an institutionally based, closed source, with responses directly inputted by registered nurse participants. The project investigator and student investigator only had access to the results, ensuring data security.

A source of bias in this project was that the student investigator designed the project and CNE course and delivered the education to the chemotherapy-certified registered nurse participants. However, to mitigate this bias, the education activity’s content was peer-reviewed and accredited by the state’s nursing association. The project’s participant population was a convenience sample of chemotherapy-certified registered nurses that self-selected to participate. Of all nonrandomized sampling options, convenience sampling poses the greatest threat to bias (Lo Biondo & Haber, 2018). The pre- and post-test nursing satisfaction survey design may have been the reason for attrition for the post-test portion of the project. To address this, the student investigator
sent weekly email reminders during month 3 and posted signs in the break room reminding the chemotherapy-certified registered nurse participants about the survey.

**Ethics and Human Subjects Protection**

The primary ethical concerns found within quality improvement projects are breach of confidentiality and emotional, social, or financial risk (Dixon, 2017). CHIP did not involve risk for breach of confidentiality. The project investigators did not collect any personal identifying information. Chemotherapy-certified registered nurse participants did not incur any cost for their participation in the project. Chemotherapy-certified registered nurse participants did not have to answer any questions of a sensitive nature. Participation in this project was voluntary, and chemotherapy-certified registered nurse participants consented prior to accessing each survey (see Appendix F). As chemotherapy-certified registered nurse participants entered their responses into REDCap® directly, neither the project investigator nor the student investigator knew how individuals responded. The student investigator provided CNE certificates to all course attendees that met CNE requirements, regardless of their participation in the surveys. The student investigator personally delivered the certificates to chemotherapy-certified registered nurse participants upon completion of the CNE evaluation and post-test as required by the state’s nursing association. The student investigator stored the CNE sign-in sheet in a drawer in the student investigator’s office, which stayed locked, and will continue to do so for the required 6-year time frame. After that period, the student investigator will destroy the sign-in sheet by placing it in the institutional locked document bin collected by Adelante Enterprises Document Destruction Services, a
document shredding provider contracted by the oncology center. The student investigator submitted the project to the oncology center’s affiliated Institutional Review Board for approval.

**Timeline**

The timeline for this project was:

**I. Planning and development: 10/15/2020–5/14/2021**

- a. Letters of support from nursing director and institution
- b. Proposal review and approval by the committee and University of New Mexico College of Nursing
- d. Arrangement and preparation for in-service of staff at the facility (see Appendix G)
- e. Arrangement of statistician assistance

**II. Project implementation: 5/15/2021–9/30/2021**

- a. Advertisement of course to nurses using approved CNE flier posted in the facility and sent to entire registered nursing infusion unit email listserve
- b. Registration for live in-service, including the link to the REDCap® pre-test survey
- c. Live CNE held over the Zoom videoconferencing platform due to social distancing requirements
d. Link to enduring CNE sent to all nurses with consent and link to pre-test survey

e. 3 months after CNE activity, email sent to unit listserv for registered nurses with links to either CNE survey (same as post-test survey); nurses could opt-out of the analysis and earn their CNE credit

f. 6 months after the live CNE course, closed survey access to REDCap® for registered nurses and enabled automated scoring and export for analysis

III. Data analysis: 10/1/2021–11/1/2021

a. Completion of statistical analysis with the University of New Mexico College of Nursing statistician

b. Summary of findings and discussion

c. Submission of final analysis to the committee

d. Presentation of project and findings to the committee, University of New Mexico College of Nursing, and cancer center community

Budget

This project’s budget was primarily in-kind, as demonstrated in the letters of support from the nursing director and cancer center administration. The student investigator paid the fee for the CNE peer review process using funds designated for DNP studies. The Health Sciences Center on campus provided REDCap® access for no fee. Nursing leadership recruited project participants using workplace email, and leadership allowed for participation during work hours (see Appendix A). Chemotherapy-
certified registered nurse participants who registered for and participated in the CNE received 1.0 credit hours from the state nursing association (see Appendix D).

Chemotherapy-certified registered nurse participants did not incur any known costs because of their participation. If they participated in the enduring activity, they did so on their non-work schedule.
CHAPTER FOUR: RESULTS AND DISCUSSION

Results

Nursing leadership and the student investigator invited all 40 chemotherapy-certified registered nurses at the project’s facility to attend a CNE lecture about providing patients with chemotherapy education and reviewing side effect management techniques. The lecture took place during the monthly chemotherapy nurses meeting. Twenty-nine nurses (73%) attended this synchronous learning activity via Zoom videoconferencing to comply with COVID-19 safety practices.

Prior to giving the lecture, nursing leadership and the student investigator invited all 40 chemotherapy-certified registered nurses to answer a pre-implementation nursing satisfaction survey developed by Gallegos et al. (2019) and adapted for this project. The nursing satisfaction survey consisted of eight items and the value for Cronbach’s Alpha for the survey was $\alpha = 0.88$, which indicates a good level of internal consistency (Stommel & Dontje, 2014). Participants provided demographic information including gender, education level, years of nursing experience, and years of oncology nursing experience. Thirty-three nurses (83%) answered the demographic section. Participants were 93% female, 85% had at least a BSN, 94% had at least 5 years of experience as a nurse, and 60% had at least 5 years of experience in oncology nursing. Three months after the lecture, the unit’s nurse leader sent the chemotherapy-certified nurses an email invitation to answer the post-implementation survey. Post-implementation demographics were slightly different: participants were 97% female, 77% had at least a BSN, 90% had at least 5 years of nursing experience, and 47% had at least 5 years of oncology nursing experience.
experience. We attributed the changes in education and experience to new changes in staffing. Figure 1 shows a comparison of pre- and post-implementation demographics.

**Figure 1**

*Pre- and Post-Implementation Chemotherapy-Certified Nurse Demographics*

Thirty-five chemotherapy-certified registered nurses answered the pre-implementation survey and thirty-three chemotherapy-certified nurses answered the post-implementation survey. They evaluated eight constructs on a 4-point Likert type scale. The maximum score for each construct was 4.0. Mean pre-implementation scores ranged from 2.03 to 2.51. Mean post-implementation scores ranged from 2.18 to 2.79. There was improvement of 1.59% to 17.73% in seven of the eight constructs and a decrease of 2.24% in one construct.

The item “the chemotherapy education process is consistent and standardized” showed the greatest improvement at 17.73% (*p* = 0.04), which is statistically significant. The item “my job satisfaction is positively affected by the current chemotherapy
education process” showed 17.21% improvement ($p = 0.05$). The only item that showed a decrease was “the current chemotherapy education process maximizes my efficiency with patients”. This score decreased by 2.24% ($p = 0.86$). Table 2 presents a comparison of pre- and post- implementation scores. While there was improvement in seven of the eight constructs, these scores indicate that there is still more room for improvement.
Table 2

Pre- and Post-Implementation Nursing Satisfaction Survey Results

<table>
<thead>
<tr>
<th>Nurse Construct</th>
<th>Pre-implementation (N=35)</th>
<th>Post-implementation (N=33)</th>
<th>% change</th>
<th>p</th>
<th>Z-score</th>
</tr>
</thead>
<tbody>
<tr>
<td>The chemotherapy education process is comprehensive</td>
<td>M 2.51 (\pm) 0.60</td>
<td>M 2.55 (\pm) 0.74</td>
<td>↑1.59</td>
<td>0.74</td>
<td>-0.31</td>
</tr>
<tr>
<td>The current chemotherapy education process maximizes my efficiency with patients</td>
<td>M 2.23 (\pm) 0.64</td>
<td>M 2.18 (\pm) 0.76</td>
<td>↓2.24</td>
<td>0.86</td>
<td>0.18</td>
</tr>
<tr>
<td>The chemotherapy education process is consistent and standardized(^a)</td>
<td>M 2.03 (\pm) 0.57</td>
<td>M 2.39 (\pm) 0.79</td>
<td>↑17.73</td>
<td>0.04</td>
<td>-2.04</td>
</tr>
<tr>
<td>My patients were well prepared for chemotherapy</td>
<td>M 2.24 (\pm) 0.64</td>
<td>M 2.52 (\pm) 0.70</td>
<td>↑13.00</td>
<td>0.14</td>
<td>-1.47</td>
</tr>
<tr>
<td>I have adequate resources and tools to enhance the education process (^a,b)</td>
<td>M 2.47 (\pm) 0.65</td>
<td>M 2.77 (\pm) 0.55</td>
<td>↑12.15</td>
<td>0.14</td>
<td>-1.46</td>
</tr>
<tr>
<td>The amount of time I spend teaching and reinforcing chemotherapy education is</td>
<td>M 2.29 (\pm) 0.66</td>
<td>M 2.39 (\pm) 0.74</td>
<td>↑4.37</td>
<td>0.44</td>
<td>-0.78</td>
</tr>
<tr>
<td>appropriate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The amount of education and resources provided to patients is appropriate</td>
<td>M 2.51 (\pm) 0.65</td>
<td>M 2.79 (\pm) 0.59</td>
<td>↑11.16</td>
<td>0.15</td>
<td>-1.43</td>
</tr>
<tr>
<td>My job satisfaction is positively affected by the current chemotherapy</td>
<td>M 2.15 (\pm) 0.60</td>
<td>M 2.52 (\pm) 0.70</td>
<td>↑17.21</td>
<td>0.05</td>
<td>-1.96</td>
</tr>
<tr>
<td>education process(^a)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Press Ganey® Scores

The facility’s Press Ganey® scores for the item “explained management of chemotherapy side effects” during the 6 months prior to the implementation of the standardized chemotherapy teaching ranged from 86.3 to 91.9, with a 6-month average score of 89.9. During the 6 months post-implementation, scores ranged from 89.5 to 92.37, with a 6-month average score of 90.7, as shown in Figure 2.

Figure 2

Press Ganey® Scores for “Explained Management of Chemotherapy Side Effects”

Kirkpatrick Model™

The Kirkpatrick Model™ is used to evaluate outcomes of education and training programs. This model evaluates knowledge and behavior at four levels. Level 1 is reaction to learning and reflects how participants feel about the activity. Level 2 evaluates participants’ learning and Level 3 evaluates their behavior, either a change or an intent to
change behavior. Level 4 evaluates results and what the activity has done to benefit the organization (Kirkpatrick Partners, 2009).

The project investigators evaluated the educational activity using the survey that CNE participants filled out in order to receive their credit. Using the Kirkpatrick Model™, we evaluated participants’ learning and behavior and the results of the CNE activity. As shown in Figure 3, 86% of participants felt their personal learning outcome was met; the content of the activity was fair, balanced, and free from promotion; and the expected learning outcome of the activity was met.

**Figure 3**

*Participant Evaluation of Educational Activity*

These metrics align with Kirkpatrick Levels 1 and 2 (reaction and learning). Kirkpatrick’s Level 3 (behavior) can be evaluated by looking at the responses to “I believe I can successfully apply this in my job” as well as the plan to make changes to current practice. Eighty-six percent of participants felt they could apply the information
in their current practice, and some provided examples of how they would implement changes to their practice, but there is no way to effectively measure this change. Level 4 of the Kirkpatrick Model™ gauges results for the organization. These can be measured using the nursing satisfaction survey (see Table 2), which showed improvement in seven of the eight measured areas, including a statistically significant improvement to the item “the chemotherapy education process is consistent and standardized”.

**Strengths and Weaknesses of the Project**

This project’s strengths included providing the participating chemotherapy-certified registered nurses with a CNE activity accredited by the state nursing association. The student investigator used a published checklist to guide the content of the CNE activity. Researchers incorporating this checklist demonstrated positive effects in another quality improvement project (Dalby et al., 2013). The CHIP investigators employed a published survey (Gallegos et al., 2019) that was used with a similar population of chemotherapy-certified registered nurses. The value for Cronbach’s Alpha for the survey was $\alpha = 0.88$.

Weaknesses of this project included a small sample size and the use of a convenience sampling technique. Due to the pre-test and post-test design, some participants only took the pre-implementation survey and others only took the post-implementation survey; this was due in part to changes in staffing. No published results exist regarding the survey’s reliability and validity, which limits its face validity.

While Press Ganey® is a widely used method to analyze patient satisfaction, it is impossible to know which respondents received the standardized chemotherapy teaching.
As an example, the project facility received 388 Press Ganey® responses in January 2021; of these, 90 respondents answered the chemotherapy section’s questions. The infusion suite serves about 90 patients per day, with an average of 5 patients per day receiving new teaching (A. Cox, personal communication, February 11, 2021), so 90 responses over a month’s time would account for a maximum of 5% of infusion patients cared for in that time period.

**Conclusion**

This quality improvement project was founded on available evidence and demonstrated significant improvement in nursing satisfaction and a notable stabilization in patient reports of side effect management. The project aimed for sustained changes, as registered nurses continue to offer standardized, evidence-based, and effective patient education support chemotherapy patients’ symptom management. Providing quality education to first-time chemotherapy recipients is a crucial component of the nursing care they receive. The nurse leader at the project’s facility reported registered nurses’ concerns over the current process and what components they felt needed to be covered in patient education (A. Cox, personal communication, January 24, 2020). Augmenting the registered nurses’ education was an important avenue to increase patients’ knowledge and satisfaction. Standardizing the patient education process by using checklists and standardized materials led to increased satisfaction among this facility’s nursing staff. Registered nurses who met the CNE learning objectives for delivering consistent, structured, complete patient education, and who are aware of the best methods to do so, indicated a plan to implement these strategies in their daily practice. Considering that
some improvement was seen in seven out of eight constructs, as well as some improvement in the trends of the Press Ganey® scores, aligning with the higher Levels 3 and 4 of the Kirkpatrick Model™ outcomes, this project was a good start. When presenting these results to the chemotherapy-certified nurses and nursing leadership, common themes discussed to further improve the education plan included considering having one person to act as the chemotherapy patient educator and working with patients to give chemotherapy education a day or two prior to the first treatment. More discussion will take place to determine the feasibility of these ideas. Based on the improvement in nursing satisfaction scores with a standardized and consistent process, as well as improvement with job satisfaction related to the education process, nursing management at the project facility expressed a commitment to continue using a standardized approach to chemotherapy education.
References

Act Academy. (n.d.). *Plan, do, study, act (PDSA) cycles and the model for improvement.*

NHS England.


https://doi.org/10.1016/j.ecns.2020.09.006


Appendix A: Letter of Support from Nurse Leader

February 9, 2020

Kristen Ostrem-Niemieciewicz, Principal Investigator
Lori Lelli, Student Investigator
DNP Program
UNM College of Nursing
MSC 098350
1 University of New Mexico
Albuquerque, NM 87131

Concerned:

I write to you in support of Lori Lelli’s Chemotherapy Instruction Improvement Project. I understand that upon UNM IRB approval, Ms. Lelli will present a New Mexico Nurses Association accredited Chemotherapy Instruction review to our infusion suite nurses. Nurses who participate in the course will earn 1.0 continuing nursing education credit (CNE). For nurses who cannot attend the live activity, Lori will also offer an enduring education activity that they can do on their own if they choose. I understand that this project aims to increase our nurses’ knowledge regarding new chemotherapy patient education and follow Press Ganey scores for the question “Explain management of chemotherapy side effects,” in hopes of seeing improvement.

To assist Ms. Lelli with this project, I will send an e-mail via our secure workplace server to our infusion nurses with the link to the consent that they will complete and gain access to the pre and post-project surveys. I will also make the Press Ganey® scores available for the question “Explain management of chemotherapy side effects” for the period of January 2021—December 2021. Ms. Lelli will upload all surveys and Press Ganey® scores into the REDCap® application, which will provide data security.

I look forward to working with Ms. Lelli on this quality improvement project.

Sincerely,

Andrea F. Cox RN, BSN, OCN
Nurse Manager-Infusion Suite
University of New Mexico Cancer Center
February 9, 2020

Kristen Ostrem-Niemcewicz, Principal Investigator
Lori Lelli, Student Investigator
DNP Program
UNM College of Nursing
MSC 095350
1 University of New Mexico
Albuquerque, NM 87131

To whom it may Concern:

I write to you in support of Lori Lelli’s Chemotherapy Instruction Improvement Project. I understand that upon UNM IRB approval, Ms. Lelli will present a New Mexico Nurses Association accredited Chemotherapy Instruction review to our Infusion Suite nursing staff. Infusion nurses who participate in the course will earn 1.0 continuing nursing education credit (CNE). For nurses who cannot attend the live activity, Lori will also offer an enduring education activity that they can do on their own if they choose. I understand that this project aims to increase our nurses’ knowledge regarding new chemotherapy patient education and follow Press Ganey® scores for the question “Explained management of chemotherapy side effects” with the hopes of seeing improvement.

To assist Ms. Lelli with this project, the infusion nurse leader will send an e-mail via our secure workplace server to our infusion nurses. The e-mail will contain a link to the consent participants will complete to gain access to the pre and post-project surveys. Our infusion nurse leader will also make the Press Ganey® scores available for the question: “Explained management of chemotherapy side effects” for the period of January 2021- December 2021. Ms. Lelli will upload all surveys and Press Ganey® scores into the REDCap® application, which will provide data security.

I look forward to working with Ms. Lelli on this quality improvement project.

Sincerely,

Sandi Peacock, RN, BSN, MBA
Clinical Operations Director
UNM Comprehensive Cancer Center
(505)925-0213
Appendix C: Approval of Live Continuing Nursing Education Activity

1/31/2021

Dear Ms. Lelli,

I am happy to inform you that your nursing continuing professional development offering for Chemotherapy Instruction Review for 1.0 contact hours has been approved. The Approval Code is 2101-07 This activity may be presented through the Expiration Date, 6/15/2022.

The following language must be provided in writing to the learners prior to the activity and must appear on your certificate:

This nursing continuing professional development activity was approved by New Mexico Nurses Association, an accredited approver by the American Nurses Credentialing Center’s Commission on Accreditation.

If you are offering this activity multiple times, your marketing materials should list the expiration date. You may offer this nursing continuing professional development activity as often as you wish for the next two years.

A Nurse Planner Summary Evaluation may be found on the nmna.nursingnetwork.org website and must be sent to NMNA within 30 days after each offering of the activity or annually if Enduring Materials via email to CEPAPS@nmna.org. If you have questions regarding the evaluation summary, please contact me at the same email address.

Nurses are continually seeking Nursing Continuing Professional Development / Continuing Education offerings. If you would like to have it posted on the NMNA website, please contact me.

On behalf of NMNA, thank you for your continued commitment and efforts to enhance nursing continuing professional development for registered nurses.

Sincerely,

Squaw J. Conforth, MRA, RSC, RN
Nurse Peer Review Leader
New Mexico Nurses Association
Appendix D: Recruitment Email

Email Recruitment

Opportunity to Participate in a Quality Improvement Project

Dear Infusion Nurse,

We are conducting a quality improvement project about nurses’ knowledge and experience regarding a practice change involving standardizing chemotherapy education.

You are receiving this email because you are currently practicing as an oncology infusion nurse in the facility where the practice change will take place.

The purpose of this quality improvement project is to evaluate nursing knowledge and satisfaction after attending a standardized chemotherapy education session. Additionally, we will analyze Press Ganey® scores to see if patient satisfaction increases with the question “Explained how to manage chemotherapy side effects” after the nursing education intervention.

If you agree to participate, this project will involve completing a survey prior to taking the Chemotherapy Instruction Review course and completing the same survey three months after you take the course.

Risks and Benefits.

There are no known risks to participation, but you may feel a loss of privacy by answering the survey questions. The benefits are taking an active role in improving the quality of care you provide to patients.

Compensation: If you participate in the Chemotherapy Instruction Review course, you will receive 1.0 complimentary Continuing Nurse Education credit, accredited by the New Mexico Nurses Association. The Chemotherapy Instruction Review Course will cover the following topics:

- Elements to cover in a new patient chemotherapy teaching session
- Health literacy considerations
- Teach-back Method
- Common side effects of chemotherapy and their treatment
- Patient resources

You do not have to participate in this project, and your decision to be in any project is totally voluntary.

If you feel you understand the project and would like to participate, please register for, and attend the Chemotherapy Instruction Review course and click the link to fill out the consent and REDCap® survey.
Appendix E: Nursing Pre- and Post-Implementation Survey

<table>
<thead>
<tr>
<th>Nurse Construct</th>
<th>Preimplementation (N = 50)</th>
<th>Postimplementation (N = 25)</th>
<th>% Change</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>The current chemotherapy education process is comprehensive.</td>
<td>3.9 ± 0.8</td>
<td>4.4 ± 0.7</td>
<td>128</td>
<td>0.03</td>
</tr>
<tr>
<td>The current chemotherapy education process maximizes my efficiency with patients.</td>
<td>3.5 ± 1.1</td>
<td>4.4 ± 0.5</td>
<td>25.7</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>The current chemotherapy education process is consistent and standardized.</td>
<td>5.5 ± 1.3</td>
<td>4.3 ± 0.7</td>
<td>43.3</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>My patients were well prepared for chemotherapy.</td>
<td>3.5 ± 0.9</td>
<td>4.4 ± 0.6</td>
<td>25.7</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>I have adequate resources and tools to enhance the education process.</td>
<td>3.6 ± 1.1</td>
<td>4.4 ± 0.7</td>
<td>22.2</td>
<td>0.002</td>
</tr>
<tr>
<td>The amount of education and resources provided to patients is appropriate.</td>
<td>3.2 ± 0.9</td>
<td>4.4 ± 0.6</td>
<td>33.5</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>The amount of time I spend teaching and reinforcing chemotherapy education is appropriate.</td>
<td>3.3 ± 1.1</td>
<td>4.2 ± 0.7</td>
<td>23.3</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>My job satisfaction is positively affected by the current chemotherapy education process.</td>
<td>3.5 ± 1.1</td>
<td>4.2 ± 0.8</td>
<td>20</td>
<td>0.006</td>
</tr>
<tr>
<td>Average score across all constructs</td>
<td>3.4 ± 0.8</td>
<td>4.3 ± 0.5</td>
<td>26.5</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

Note. Scores range from 1 (strongly disagree) to 5 (strongly agree).

Appendix F: Informed Consent

Chemotherapy Instruction Improvement Project
Informed Consent for Surveys of Oncology Center Infusion Nurses

Kristen Ostrem-Niemczewicz, DNP, RN, CNM, FNP-BC, FACNM, from the University Of New Mexico College Of Nursing is conducting a research project. The purpose of the research is to assess nursing satisfaction with a using a standardized chemotherapy education process. You are being asked to participate because you are currently employed as an Oncology Infusion Registered Nurse.

Your participation will involve completing a pre- and post-implementation survey and participating in a New Mexico Nurses Association accredited education activity. The surveys should take about 5 minutes to complete. The surveys include questions such as your feelings about the patient education process, time spent reinforcing education, resources if adequate resources are available to enhance the education process, how prepared you feel your patients are for chemotherapy, and your job satisfaction with the process. Your involvement in the research is voluntary, and you may choose not to participate. You can refuse to answer any of the questions at any time. There are no names or identifying information associated with your responses. The following demographic information will be requested: age range, gender, level of education, years of nursing experience, and years of oncology experience. There are no known risks in this research, but some individuals may experience discomfort or loss of privacy when answering questions. Data will be directly input by you into a secure web application, attendance records will be stored in an encrypted laptop for a period of six years as required by the New Mexico Nurses Association. All identifiable information (e.g., your name, date of birth) will be removed from the information collected in this project. After we remove all identifiers, the information may be used for future research or shared with other researchers without your additional informed consent.

The findings from this project will provide information on nurses' feelings about the comprehensiveness of the education process, patients' preparedness for chemotherapy, resources and tools available to enhance the education process, appropriateness of time spent teaching and reinforcing education and if level of job satisfaction is positively affected by the current process. If published, results will be presented in summary form only.

If you have any questions, concerns, or complaints about the research, please feel free to call Kristen Ostrem-Niemczewicz, DNP, RN, CNM, FNP-BC, FACNM at (505) 272-9630. If you have questions regarding your rights as a research participant, or about what you should do in case of any harm to you, or if you want to obtain information or offer input, please contact the UNM Office of the IRB (OIRB) at (505) 277-2644 or irb.unm.edu.

By clicking OK you will be agreeing to participate in the above-described research.
Appendix G: Continuing Nursing Education Activity Content

Chemotherapy Instruction Review

I. Introduction
   A. Objectives

II. Components to cover with new chemotherapy education
   A. General Assessment
      1. Assess readiness to learn, literacy, other barriers
      2. Review plan for the day
      3. Offer the videos to started

III. Care Plan
   A. Review chemotherapy regimen
   B. Review Premedications
   C. Most common side effects and management
      1. Chemotherapy induced nausea/vomiting
      2. Appetite loss
      3. Fatigue
      4. Hair loss
      5. Neuropathy
      6. Mucositis
      7. Diarrhea
      8. Constipation
   D. Review new medications for home management
      1. Antiemetics
      2. Antidiarrheals
      3. Antibiotics
      4. Antibiotics
      5. Antivirals
      6. Antifungals
   E. Reportable symptoms
      1. Temperature > 100.4
      2. Uncontrolled nausea/vomiting/diarrhea
      3. Constipation
      4. Uncontrolled pain
      5. Pain, sores, or white patches in the mouth
Chemotherapy Instruction Review

F. Home Safety
   1. Infection prevention/Neutropenic precautions
   2. Fertility and safe sexual practices
   3. Chemo spills
   4. Laundry

G. Treatment Calendar

IV. Lines of Communication
   A. Confirm contact and emergency contact
      1. Release of Information form
   B. How to contact the Cancer Center

V. Patient Resources
   A. Support Services
      1. Navigators
      2. Social Workers
      3. Nutritionists
   B. Sources of reliable information
      1. American Cancer Society
      2. National Cancer Institute
      3. Chemocare®
   C. Web Applications
      1. Chemowave®
      2. My Cancer Coach Genomic Health®
      3. Belong life

VI. Conclusion
   A. Discussion/Q&A