2020

Nurse-delivered Standardized Chemotherapy Education Intervention to Reduce Distress among Older Adults in an Outpatient Setting

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Nurse-delivered Standardized Chemotherapy Education Intervention
to Reduce Distress among Older Adults in an Outpatient Setting

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Date of Submission: April 30, 2020
Table of Contents

Abstract..............................................................................................................5

Background....................................................................................................6

Problem Statement............................................................................................7

Organizational “Gap” Analysis of Project Site....................................................7

Review of the Literature....................................................................................9

Search Methods................................................................................................9

Search Results..................................................................................................10

Evidence-Based Interventions........................................................................10

Evidence-Based Practice: Verification of Chosen Option...............................12

Theoretical Framework/Evidence-Based Practice Model................................13

Methods..........................................................................................................14

Project Design..................................................................................................14

Ethical Considerations/Protection of Human Subjects....................................15

Goals, Objectives, and Expected Outcomes....................................................15

Project Site and Population.............................................................................16

Barriers and Facilitators..................................................................................17

Cost-Benefit Analysis.......................................................................................18

Implementation: Overview............................................................................18

Measurement Instruments..............................................................................19

Data Collection Procedure............................................................................20

Data Analysis..................................................................................................21

Results............................................................................................................22
Demographics........................................................................................................22

Non-Intervention Group..........................................................................................22

Intervention Group....................................................................................................23

Distress Thermometer...............................................................................................24

Group 1 vs. Group 2 Post-Distress Thermometer Comparisons............................24

Group 1 Pre- and Post-Distress Thermometer Comparisons..................................24

Group 2 Pre- and Post-Distress Thermometer Comparisons..................................24

Problem List................................................................................................................25

Patient Satisfaction Survey........................................................................................27

Patient Survey Comments..........................................................................................27

Interpretation/Discussion............................................................................................28

Theoretical Outcomes.................................................................................................30

Implications for Nursing.............................................................................................31

Conclusion..................................................................................................................32

References..................................................................................................................33

Appendices..................................................................................................................38

Appendix A: Letter of Organizational Support..........................................................38

Appendix B: Literature Review Matrix.......................................................................39

Appendix C: Written Educational Materials..............................................................48

Appendix D: Measurement Tools...............................................................................64

Appendix E: Theoretical Framework.........................................................................65

Appendix F: IRB Approval..........................................................................................66

Appendix G: Patient Satisfaction...............................................................................67
Appendix H: Cost Analysis

68
Abstract

Background/Review of Literature: A new cancer diagnosis is overwhelming and stressful. A multitude of information will be shared, and treatment initiated quickly. To prepare patients for chemotherapy, a comprehensive and systematic education program should be utilized. Combining written instructions and supportive material with nurse-led teaching sessions have been found to be most beneficial. Well prepared patients have been shown to have less anxiety, more confidence to handle adverse effects at home, and improved quality of life. Purpose: The quality improvement (QI) project purpose was to explore the effect of a nurse-delivered, enhanced education intervention on distress among older adults receiving chemotherapy in an outpatient setting. Design/Methods: The enhanced chemotherapy education intervention consisted of a 1-hour educational class facilitated by an oncology nurse, PowerPoint presentation, and written materials. A quasi-experimental, pretest-posttest design was used to compare outcomes across two groups of patients. Procedures: Group 1 received whatever pre-chemotherapy educational materials usually offered to patients by the unit (usual care). Group 2 received enhanced educational intervention prior to their first cycle of treatment. Both groups completed a Distress Thermometer and Problem List prior to Cycle 1, and prior to Cycle 2. All participants completed an investigator-designed patient satisfaction survey.

Results/Interpretation: Both groups reported less distress prior to Cycle 2. Group 2 reported higher satisfaction scores (100% vs. 89%), called/came to office with fewer concerns (2 vs. 7), and fewer Emergency Room and hospital visits (1 vs. 2). The QI project resulted in improved patient satisfaction, decreased need for intervention with side effects, and fewer hospital visits among adult cancer patients receiving chemotherapy in an outpatient community setting.

Keywords: chemotherapy education, distress, quality of life, nurse-led
Nurse-delivered Standardized Chemotherapy Education Intervention to Reduce Distress among Older Adults in an Outpatient Setting

A diagnosis of cancer is a life-altering event. Treatment plans are made and patients are quickly thrown into a new world of chemotherapy, side effects, and managing complicated medications at home (Apor et al., 2018; Garcia, 2014; Mollaoglu & Erdogan, 2014; Sahin & Erguney, 2015; Sahin, Erguney, Sahin, & Erguney, 2016; Yuce & Yurtsever, 2017). While anxiety can never be completely resolved, it can be reduced through empowering patients and their caregivers with relevant evidence-based education and resources. Walking into a chemo room for the first time can be emotional and overwhelming for a patient. Education given before the first administration of chemotherapy has been shown to reduce this anxiety and lead to better quality of life.

**Background**

According to estimates by the American Cancer Society (ACS), over 1.8 million people in the United States will be diagnosed with cancer in the year 2020 (ACS, 2019). This represents a staggering 4,950 new cases of cancer per day (Siegel, Miller, & Jemal, 2020). Although the 5-year survival rate for cancer is improving, cancer remains the leading cause of death and is expected to rise over the next 10 years to over 23 million worldwide (National Cancer Institute [NCI], 2018). The Centers for Disease Control and Prevention (CDC) estimated in 2018 that 650,000 patients will receive chemotherapy annually (CDC, 2018).

Lack of quality educational resources for patients prior to initiating treatment can lead to them being poorly equipped to handle side effects and increase their anxiety and distress. In accordance with the six quality-dimension initiatives recommended by the Institute of Medicine (IOM), a safe and patient-centered approach should be utilized when delivering care (Agency for
Healthcare Research and Quality [AHRQ], 2016). Minimum recommendations made by the American Society for Clinical Oncology (ASCO) guidelines include providing verbal and written education to patients prior to the first treatment. This education should include basic medical information, supportive care, contact information, and involve family (Neuss et al., 2017).

The problem of incomplete pre-chemotherapy education is significant on a local level as not all patients who are scheduled to begin chemotherapy are being provided complete educational preparation. Empowering patients with tools to manage adverse effects supports competence and when done early in diagnosis can decrease anxiety and stress levels (Papadopoulou et al., 2017). Patients who are not provided education using a standardized approach can be missing key information regarding the complexities of chemotherapy administration.

**Problem Statement**

When newly diagnosed adult cancer patients (>18 years); are not adequately informed and prepared to receive chemotherapy treatments prior to the first time they enter the infusion center, they often experience more distress and anxiety than they already have. This state can lead to increased adverse effects such as nausea, vomiting, and dehydration and is influenced by not having had quality, literacy appropriate, and standardized pretreatment chemotherapy education.

**Organizational “Gap” Analysis of Project Site**

Lack of education prior to treatment can lead to increased anxiety and side effects, ultimately decreasing the quality of life in cancer patients (Apor et al., 2018; Garcia, 2014; Mollaoglu & Erdogan, 2014; Sahin & Erguney, 2015; Sahin, Erguney, Sahin, & Erguney, 2016;
NURSE-DELIVERED STANDARDIZED CHEMOTHERAPY

Yuce & Yurtsever, 2017). Furthermore, standardization of educational processes can lead to improved nursing satisfaction, improved efficacy of staff time, and improved quality of care (Gallegos et al., 2019). The site used for this QI project is a physician-owned private practice located in Central Florida. Permission by the organization was obtained and can be found in Appendix A. At the time of the QI project, this office had seven physicians and eight nurse practitioners. There is a large volume of patients each week in the infusion room. Approximately 300–350 patients per week receive chemotherapy or other intravenous treatments there, and approximately ten of those are starting chemotherapy for the first time. The chemotherapy room contains 30 chairs. Not all patients were getting education prior to starting chemotherapy; some were unsure what to expect or how to manage their side effects. This uncertainty can lead to a worsening of common adverse effects such as nausea and vomiting as well as not seeking prompt treatment for serious side effects related to neutropenia.

The charge nurse is responsible to provide a brief verbal educational session. Materials are printed by the nursing staff from a variety of online sources and placed in a binder. It was difficult to track in a definitive way the number of patients missing the educational class or missing key information and resources. Printed materials were not verified by practitioners for health literacy or appropriateness. There was no uniformity for patient education between different offices in the practice. The practice’s website had many valuable educational resources available; however, there was not one for general prechemotherapy orientation. Over 100 offices are part of this practice and, while some locations had been improving on the educational processes, there was no uniform policy. When patients and caregivers do not get adequate education and knowledge to provide care at home, it can lead to increased anxiety and ineffective
care (Garcia, 2014). Therefore, the goal of the QI project was to establish a model that will standardize the education program used for all new cancer patients at all locations in the practice.

**Review of the Literature**

**Search Methods**

An extensive literature search was completed, including the following databases: Current Index to Nursing Allied Health Literature Complete (CINAHL), PubMed, Google Scholar, Cochrane Library, and Ovid. All searches were limited to articles during 2013–2019, in the English language, peer reviewed, and research articles. CINAHL was searched using the terms *chemotherapy education* or *chemotherapy education for newly diagnosed cancer patients* or *pre-chemotherapy education* or *prechemotherapy education*. The search was limited to age groups 19+. This yielded 111 articles with 91 excluded at the title. A total of 20 articles were given complete review. One was excluded as it focused on patient beliefs about treatment, one was a duplicate of a PubMed article, one was specific to neuropathy, one was excluded for not being a pretreatment intervention, one was coping strategies without intervention, one covered chemo administration, and finally four were specific to oral chemotherapy. Nine articles were selected and included in this review.

PubMed and Cochrane were searched using Medical Subject Headings (MeSH) terms *antineoplastic therapy* and *patient education*, excluded for oral chemotherapy. Articles were limited to adults. Cochrane yielded zero articles. PubMed yielded 132 articles, 99 were excluded at title, 21 were excluded at abstract review, and 12 required full review. Two were excluded for small sample size, one was not a study, four were not pretreatment, one was about implanted ports, one was specific to drug adherence, and one was a review of older literature. Two articles remain included in this review.
Google Scholar was searched using terms “prechemotherapy education for patients” excluded for term oral, yielded 945 articles. The search terms were narrowed to the phrase “chemotherapy education,” yielding 30 articles. Five were included for complete review after excluding 25 duplicates from other databases or in this search. One was an abstract of an article already included, one was a review, one had small sample sizes, one was specific to goals that yielded one article for this review. The Ovid database was searched for keywords *chemo* education or *prechemo* education or *pre-chemo* education and *patient education* yielding four articles. Three were excluded for being oral treatments, and one was specific for symptom control, leaving zero.

**Search Results**

The 12 articles were appraised using the MeInyk Levels of Evidence (Melnyk & Fineout-Overholt, 2011). Quality of the evidence was rated using the Johns Hopkins Nursing Evidence-Based Practice Quality of Evidence Rating Scale (Poe & White, 2010). The 12 articles in this review include one randomized controlled trial, six quasi-experimental articles, one integrative review, one longitudinal study, and two non-experimental studies. The Appraisal of Guidelines for Research and Evaluation (AGREE II; Brouwers et al., 2010) was used for scoring ASCO guidelines. A matrix of this data can be found in Appendix B.

**Evidence-Based Interventions**

The evidence supports the use of patient education prior to the first chemotherapy. All but one of the 12 studies used education prior to the first chemo. The intervention of a DVD was utilized by Milanti, Metsala, and Hannula (2016), which was shown during the actual administration of chemotherapy. Several studies used multiple educational sessions with the first session prior to the first chemo (Gallegos et al., 2019; Mollaoglu & Erdogan, 2014; Sahin &
Erguney, 2015; Sahin, Erguney, Sahin, & Erguney, 2016). Furthermore, this recommendation is supported in the updated ASCO guidelines in collaboration with the Oncology Nursing Society (ONS) as part of the safe administration of chemotherapy (Neuss et al., 2017). All studies concluded that education prior to the first chemo was beneficial; however, there was also one report of improved quality of life when the education occurred during the chemotherapy (Milanti et al., 2016). There was no supporting study that suggested multiple educational sessions are better than a single session.

All studies in which a verbal educational session was used support the use of a nurse as the educator. According to Garcia’s review (2014), this is a “consistent theme throughout the literature” (p. 520). The role of nurse as educator is described by (Milanti et al., 2016) as one that is unique because nurses play an important role in psychosocial interventions. It is further suggested by Apor et al. (2018) that even when the oncologist provides some education about chemotherapy, they were also discussing diagnosis and prognosis and not focused on specifics of treatment. When asked about their knowledge after having met with the oncologist, patients had zero or little information about potential adverse effects or scheduling of treatments. One study (Gallegos et al., 2019) that was designed slightly differently used one-on-one nurse-led teaching, and the group-led class was done by a pharmacist. Nursing implications recommended by Papadopoulou et al. (2017) suggest that use of education by nurses can lead to patients’ increased perception of self-care strategies and can be expected to reduce anxiety.

Written education should contain at minimum, goals of treatment, duration, schedule, names of drugs and supportive medication, potential interactions, symptoms requiring intervention of healthcare provider, self-administered treatments, handling of body secretions, follow-up appointment information, and finally pertinent contact information (Neuss et al., 2017,
There is no definitive recommendation as to which type of educational materials are more beneficial than another. In one randomized controlled study, a simple educational handbook led to decreased adverse effects (Yuce & Yurtsever, 2017). The evidence does strongly support that written content in conjunction with the verbally presented material is superior (Apor et al., 2018; Garcia, 2014; Mollaoglu & Erdogan, 2014; Sahin & Erguney, 2015; Sahin et al., 2016). In both Keener and Winokur, (2018) and Milanti et al., (2016) additional media are used. Benefits were revealed that use of a digitally recorded presentation and a video decreased anxiety and improved recall of knowledge (Fee-Schroeder et al., 2013; Keener & Winokur, 2018). The recommendation of using audiovisual material was also noted by Papadopoulou et al. (2017). A secondary benefit of the standardization process was found by Gallegos et al. (2019) in which nurses reported significant improvement in satisfaction.

**Evidence-Based Practice: Verification of Chosen Option**

Based on the literature review, this Quality Improvement (QI) project aimed to provide education to all chemotherapy-naïve patients using audio, visual, and written material. The program included using an electronic medical record (EMR) to order an educational session, an in-person 30–60-minute nurse-led educational group class using verbal and multimedia resources, and a handbook/binder of written material (see Appendix C), all provided while allowing time for patients and their family to address questions or concerns.

The patients were asked to use the National Comprehensive Cancer Network (NCCN) Distress Thermometer (NCCN, 2018) to evaluate distress levels prior to their first chemo and again prior to their Cycle 2 (see Appendix D). The educational material provided was easy-to-read in plain language that is appropriate for all health literacy levels (Centers for Medicare & Medicaid Services [CMS], 2018). The goal of this project was to provide quality education to all
prechemotherapy patients to improve quality of life by providing knowledge and decreasing distress.

**Theoretical Framework/Evidence-Based Practice Model**

The theoretical framework of Mishel’s Uncertainty in Illness was used to guide the project. Mishel’s theory explores the concept of uncertainty when being diagnosed with a new illness (Mishel, 1990). Especially in the case of chronic illness such as cancer it is common for patients to feel stressed and have difficulty coping. According to Zhang (2017), patients who are undergoing cancer treatment have higher reports of uncertainty than those undergoing surveillance. Some of the causes for the uncertainty stem from lack of information about their disease, not understanding treatment courses, and poor coping with day-to-day tasks (Zhang, 2017).

Mishel’s Uncertainty in Illness theory is comprised of four main parts: antecedents generating uncertainty, appraisal of uncertainty, coping with uncertainty, and adaptation to illness (See Appendix E). In the first component, new stimuli such as a cancer diagnosis is processed by patients according to cognitive coping abilities and support systems. In the second component, patients appraise the uncertainty, in this case a cancer diagnosis, which can be perceived as a threat or an opportunity that can have a positive outcome. In the coping phase, patients use strategies depending on their perception of the diagnosis. These strategies can range from seeking information and education, family and emotional support, or other methods of coping such as avoidance. In the final phase of Mishel’s theory the patient adapts and adjusts to the new illness (Zhang, 2017).

According to Mishel (1990), uncertainty is highest early in the illness trajectory. This is the time when a diagnosis is made, and a patient learns their life has been changed dramatically.
How the patient copes with their diagnosis and the types of support available will be the foundation of how they perceive a new way of life. Support from healthcare providers can be beneficial toward promoting integration of the new illness and way of life as one that can be adapted to and the instability and uncertainty perceived as natural (Mishel, 1990). Arming the patient with information and tools, as done in this QI project, at the time of highest uncertainty is likely to be beneficial toward promoting patient autonomy and acceptance. Discussions about treatment goals, education in several formats that are literacy-appropriate for patients and their family as part of this project aimed to decrease anxiety and distress, thereby improving the patient’s quality of life.

Methods

Project Design

The QI project utilized the Plan-Do-Study-Act (PDSA) model. In this model, a test for change is made (plan), the test is carried out (do), the results are analyzed (study), and improvements and modifications (act) are suggested (Institute for Healthcare Improvement, 2019). A QI team was created that consisted of a physician, charge nurse, chemo nurses, and the assistant office manager. The team’s aim was to facilitate the work planned by the DNP student to decrease distress and improve the quality of life for patients prior to starting chemotherapy. The DNP student compared quantitative and qualitative data from the pre- and post-intervention DT scores. A patient satisfaction survey was provided at the completion of the project, which allowed for patient input and suggestions for improvements. This non-validated survey created for the project was scored and analyzed by the DNP student. The survey was intended to be brief to prevent overwhelming patients with paperwork but still be useful for gathering insight toward patient perceptions of the educational experience.
Ethical Considerations/Protection of Human Subjects

The University of Massachusetts, Amherst (UMass) IRB approval was obtained prior to initiating the DNP Project. All patients included in the QI project were protected by the Health Insurance Portability and Accountability Act of 1996 (HIPAA) in order to protect privacy and maintain security of health information (U.S. Department of Health & Human Services, 2017). All information collected as part of the project contains no patient identifiers. Confidential information was coded using identification numbers. This information has been stored on an encrypted, password-protected storage device that was only accessible by the DNP student and the charge nurse. IRB approval appears as Appendix F.

Goals, Objectives, and Expected Outcomes

The goals for this QI project were aimed to reduce distress by providing education to all patients who were scheduled to start chemotherapy as part of their treatment plan. The specific intent of the project was to (a) improve the education of all chemotherapy-naïve patients before they began treatment, (b) provide education using a brief voice-over PowerPoint presentation, (c) provide an in-person nurse-led verbal education session lasting 60 minutes, and (d) provide detailed written material for each patient. Distress was measured using the NCCN Distress Thermometer (DT) and Problem List (PL). The scores were totaled and compared pre- and post-educational intervention. Patient satisfaction (Appendix G) was also measured using a brief Likert scale questionnaire. See Table 1 below.

Table 1:

<table>
<thead>
<tr>
<th>Goals</th>
<th>Objectives</th>
<th>Expected Outcomes</th>
<th>Result*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve education of chemotherapy-naïve</td>
<td>All patients will receive an order for education prior to</td>
<td>All patients meeting inclusion criteria will have education.</td>
<td>Objective Met</td>
</tr>
</tbody>
</table>
patients pre-treatment. initiation of first chemotherapy.

Voice-over PowerPoint presentation. Develop brief 8–10-minute voice-over PowerPoint presentation that includes basic overview of chemo/infusion center by 9/2019. 100% of patients will be provided PowerPoint presentation during teaching session. Objective Not Met **

Provide an in-person nurse-led verbal education session lasting 60 minutes. Provide patients with verbal education and allow question and answer time, encourage family/caregiver attendance. 100% of patients will receive verbal education session. Objective Met

Provide detailed written material for each patient. Develop written binder/folder using evidence-based, literacy-appropriate materials that is customizable by 9/2019. 100% of patients will receive a customized binder/folder prior to starting treatment. Objective Met

*See results sections, page 22 **See results, page 22

**Project Site and Population**

The site for this QI project took place at a private physician-owned hematology and oncology practice in the state of Florida. The practice location is one of over 100 in the organization. It contains 30 chemotherapy chairs, has seven practicing physicians, and eight nurse practitioners. It serves adult patients with all types of cancer. Approximately 10–15 patients per week start chemotherapy in this practice location, and it was estimated that only 50% were receiving formal chemotherapy education by nursing staff. The location of the practice was in the town of The Villages, Florida which is a unique, large, and fast-growing age-restricted community. As of March 2019, it had a population of approximately 120,000 residents
NURSE-DELIVERED STANDARDIZED CHEMOTHERAPY

(Straehley, 2019). The median age is 70 years old with 97% English-speaking and 2% Spanish-speaking residents (Town Charts, 2017).

**Barriers and Facilitators**

The success of the QI project relied heavily on project stakeholder buy-in. All the physicians and nurse practitioners in the practice had to be engaged so that 100% of the eligible patients were approached to participate. Providers in this location rotate daily; the DNP student provided a detailed overview of the project in writing and on a one-to-one basis with each practitioner whenever possible. Internal emails regarding planning and implementation of the project were sent to all project team members. The charge nurse was initially met with to discuss the project information and plans. Brief weekly meetings were held with the charge nurse to discuss patient scheduling and feedback about the project’s implementation and content.

Involvement of the patients and their significant others was considered the foundation of the project. Reduction of anxiety and providing patient-centered care is imperative to quality care. Encouragement of family and caregiver support when available is important not only for the patients but to allow for questions to be answered. One of the greatest facilitators of the project was the desire of all the practice staff to provide quality care that is safe and causes the least distress to cancer patients. Barriers to the project included lack of buy-in by staff and physicians, which mostly occurred due to time constraints, scheduling, and workload. Patients can often start treatment just days after being diagnosed. This leads to urgency in starting treatment. In those rare cases, patients were scheduled outside of the regular education session and were provided education on a one-to-one basis.
Cost-Benefit Budget Analysis

The costs for this QI project were minimal. The previous method for providing patient education was to print material in the office and place it in a folder. It is difficult to estimate what the previous costs were as materials were part of the office supplies. Costs incurred for this project included printing the educational handbook created by the DNP student. No additional staff salary costs for this project were required as the charge nurse was met with during normal working hours. The verified neutrality of costs highlights the ability for this project to be considered a sustainable intervention. A total breakdown of costs can be found in Appendix H.

Implementation: Overview

A homogenous sample was maintained for the project by excluding patients scheduled to receive other agents such as immune therapy or oral agents. The term chemotherapy for use in this QI project included all intravenously delivered anti-neoplastic chemotherapy agents. The patients were divided into two groups. Implementation of the project began with patients in Group 1 who were given no intervention. This group received the standard of practice for education which varied from education provided by their physician, education provided by nursing staff just prior to chemo, or a group led education provided by the charge nurse. Patients in Group 2, the enhanced education group, were scheduled for Patient Education as part of discussions with their physician about treatment plans. When chemotherapy orders were placed in the EMR, the option to choose Patient Education was made. At the end of each appointment, patients were taken to the checkout desk, where tests, follow-ups, and chemotherapy infusions were scheduled as part of usual procedures. The checkout staff were notified of the DNP student’s QI project to ensure that all patients scheduled for their first chemotherapy had ordered Patient Education and the time was scheduled appropriately.
The charge nurse populated a list of patients at the end of each week to prepare for chemotherapy medication ordering. This list also identified which patients were eligible to participate in the DNP project. A conference room large enough to hold patients and their significant others was reserved for the once weekly verbal educational session led by the charge nurse and DNP student. This was done on Friday afternoons in order to provide the enhanced education to any patient scheduled to start chemotherapy the following week. Upon completion of the 60-minute session, which began with a PowerPoint presentation, the patients were given written handout material. Time was allowed by the DNP student and charge nurse for review of the material and for any additional questions. The verbal session/PowerPoint included general information about the infusions center, pharmacologic information, and common issues experienced by patients receiving chemotherapy.

Based on observations made by the DNP student and the charge nurse, it was decided to stop using the PowerPoint presentation after the first two enhanced education sessions. Patients were noted to be focused on the slides and where to find the information on the slides in their handouts. Once the PowerPoint was eliminated, patients were given a personalized education handbook that was verbally reviewed page by page.

**Measurement Instruments**

In order to measure the outcomes of this DNP Project the following instruments were used: NCCN Distress Thermometer and Problem List (NCCN, 2018) as well as a Patient Survey developed by the DNP student. The DT instrument consists of a simple scale 0 (no distress)–10 (extreme distress). The PL portion of the Distress Thermometer has yes and no questions related to five different categories of common emotional and physical issues. This tool is useful for screening distress and has been validated for different types of cancer, in various settings, and in
multiple countries (NCCN, 2018). A meta-analysis (Ma et al., 2014) of 42 studies found, when a
cutoff score of 4 is used, a pooled sensitivity of DT to be at 81% (95% CI, 0.79–0.82) and the
pooled specificity to be 72% (95% CI, 0.71–0.72). The PL section of the tool was created by the
NCCN Distress Management Panel and has been validated by two studies (Graves et al., 2006;
Tuinman, Gazendam-Donofrio, & Hoekstra-Weebers, 2008). The PL is beneficial as a general
baseline needs assessment. The patient survey tool is brief, consisting of four Likert-scaled
questions (5 highest, 1 lowest), two yes or no questions, and a place to provide written
comments.

Data Collection Procedures

Data collection began with the first group of patients by reviewing the EMR for patients
who were planned to start Cycle 1 on Day 1 of their chemotherapy. This was done with
assistance of the charge nurse. Patients were approached during the start of their chemotherapy
while in the infusion room. The DNP project was discussed with each patient, a consent form
was completed, and a signed copy returned to the patient. Each patient was provided the NCCN
DT and PL. A spreadsheet was created to record patient medical record numbers, the date of
Cycle 1 Day 1 and the date they would start Cycle 2 Day 1. The first group of patients were
chosen to participate without any intervention in the usual educational processes or changes in
current procedure; it was recorded if they received any formal chemotherapy education or not.
Each patient included in the project on Cycle 2 Day 1 was approached while in the chemo room.
They were asked to complete the DT and PL a second time and were given the patient survey
form to complete. Scores from the patient survey were recorded as well as any written comments
made by patients. All data was recorded into an Excel spreadsheet, including patient
demographics. All de-identified data was kept in the locked file accessible only to the DNP student and the charge nurse.

Data collection for Group 2 patients was done in similar format. Patients planned to start chemotherapy were located by searching the EMR and discussions with the charge nurse. The patients were each scheduled for the enhanced chemotherapy education class through the Patient Education order in the EMR. The patients were approached about the DNP project at the beginning of the class. They were each provided the DT and PL, along with the consent form and the patient education handbook created by the DNP student. It was later determined, based on observations, to not distribute the DT and PL at the education class because patients were overwhelmed with paperwork during the class. Instead of at the class, patients were given the paperwork on Cycle 1 Day 1 of their chemo while in the infusion room. Data was collected and privacy maintained as done with Group 1 patients. Handwritten comments on patient surveys were also recorded and arranged in a table.

**Data Analysis**

The de-identified data of Group 1 and Group 2 patients included both pre-and post-DT and PL, the patient survey, handwritten comments, and demographic data. This information was used to create an Excel spreadsheet. The thermometer score from the DT was recorded as numerical value 0–10. The 39 questions of the PL were recorded as “Y” or “N.” The results of the Likert scale patient survey were recorded numerically 1–5. A final column was created to record handwritten comments. The spreadsheet was used by the DNP student to analyze pre-and post-scores of Group 1 and Group 2 patients.

At completion of data collection, the results were entered into the Statistical Package for Social Sciences (SPSS) and coded appropriately for analysis. Descriptive statistics were used to
report demographic characteristics (see Table 2), PL and patient satisfaction scores. Ratio-level data from the pre- and post-DT were analyzed using paired sample t-tests for each group and independent sample t-test for between-group comparisons. The frequency of individual items reported on the PL can be seen in Table 3. Qualitative data was collected and recorded from handwritten comments on the patient satisfaction survey (see Table 4). Additionally, patient satisfaction scores were compared along with the number of calls to the nurse triage line/visits to office, and number of visits to ER and presented in table format.

Results

Demographics

Non-Intervention Group

Group 1 of the QI project originally contained 21 patients, yet unfortunately one patient died prior to post-testing, leaving (n = 20). A second patient declined participating in the post-data collection and was therefore excluded from analysis, with remaining total participants (n = 19). The average age of Group 1 participants was 73.21 years with the minimum age of 43 and maximum age of 85. Fifty-eight percent of participants were male (n = 11), while females in Group 1 accounted for 42% (n = 8). A variety of cancer types were found among the participants, with the most common cancer diagnosis being lung cancer 15.8% (n = 3). Advanced stage cancer was found to be the most common; stage IV cancer, which included stage IVA, and IVB, was the most common at 63.2% (n = 12). A total of (n = 8) patients in this baseline group attended a group setting educational class given by the charge nurse with the usual standard procedure for education, and a total (n = 11) had some other type of education such as one-on-one with the RN in the infusion room just prior to administration of chemo.
**Intervention Group**

Nineteen patients agreed to participate in Group 2 of the DNP project and receive the enhanced educational session that was created for the DNP project. The average age in this group was 71 years old with a minimum age of 52 and maximum of 87 years. Most participants in Group 2 were female 52.6% \((n = 10)\). The most common type of cancer in Group 2 was breast 26.3% \((n = 5)\). Twenty-six percent \((n = 5)\) had advanced Stage IV cancers.

Table 2

**Participant Demographics**

<table>
<thead>
<tr>
<th>Patient Characteristics</th>
<th>Group 1 (N = 19)</th>
<th></th>
<th>Group 2 (N = 19)</th>
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<tbody>
<tr>
<td>Age (years)</td>
<td>(n)</td>
<td>%*</td>
<td>(n)</td>
<td>%*</td>
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<td>Other</td>
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Cancer Stage  
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<td>16</td>
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<td>26</td>
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</tbody>
</table>

*Rounded to nearest whole number.

**Distress Thermometer**

**Group 1 vs. Group 2 Post-Distress Thermometer Comparisons**

Group 1 (no-education intervention group) was compared to Group 2 (who received the enhanced DNP project educational intervention). Post-DT scores were compared between the two groups. The DT instrument is measured as 0 (no distress)–10 (extreme distress). The lower the number a patient chose indicates they felt less distress. A higher number indicates more perceived distress. Results were Group 1 ($M = 3.00, SD = 2.65$), and Group 2 ($M = 2.21, SD = 2.72$). An independent samples $t$-test indicated there was no statistically significant difference in the post-DT scores of Group 1 when compared with Group 2, $t(36) = .907, p = .814$.

**Group 1 Pre- and Post-Distress Thermometer Score Comparisons**

The scores of Group 1 participants were compared pre- and post-start of chemotherapy using paired samples $t$-test. The results showed that patients had higher scores before the educational session ($M = 4.95, SD = 2.80$) than they did after receiving the educational session ($M = 3.00, SD = 2.65$). The difference found was 1.95 points between the pre-DT scores and the post-DT scores. A paired samples $t$-test found this difference to be significant, $t(18) = 2.787, p = 0.012$. 
Group 2 Pre- and Post-Distress Thermometer Score Comparisons

A comparison was made within Group 2, those who received the DNP project enhanced educational intervention. The DT scores were compared pre- and post-chemotherapy. The pre-DT scores were compared with the post-DT scores. The results showed that patients had higher distress scores before the educational session ($M = 4.95$, $SD = 3.36$) than they did after receiving the educational session ($M = 2.21$, $SD = 2.72$). The difference found was 2.74 points between the pre-DT scores and the post-DT scores. A paired samples $t$-test found this difference to be significant, $t(18) = 3.311$, $p = 0.004$ (see Figure 1).

Figure 1

Distress Thermometer Scores for Both Groups.

Problem List

The PL contains 39 yes/no questions. Each group was provided the PL before Cycle 1 of chemotherapy and a second time before Cycle 2. The “Emotional Problem” section of the problem list contains seven items: depression, fears, nervousness, sadness, worry, loss of interest in usual activities, and spiritual/religious concerns. When comparing frequency data, both groups
reported yes more often in the pre-test than in the post-test to all questions except in one. Loss of interest in usual activities had an additional yes answer in the Group 2 post-test.

The Physical Problems section contains 22 items. The most frequently reported symptom in both Group 1 and Group 2 was fatigue. This number increased in Group 1 from 52.6% to 78.9% and in Group 2 it remained constant at 47.4%. Sleep was the 2\textsuperscript{nd} most reported problem in Group 1 and remained constant in both pre- and post-testing. The second most common problem in Group 2 was eating (26.3%) both pre- and post-testing and sleep, which increased in the post-test by 5.3%.

Table 3

*Problem List Frequency*

<table>
<thead>
<tr>
<th></th>
<th>Group 1</th>
<th></th>
<th>Group 2</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Pre-</td>
<td>Post-</td>
<td>Pre-</td>
<td>Post-</td>
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<tr>
<td>Child Care</td>
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<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Housing</td>
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<td>2</td>
<td>1</td>
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<tr>
<td>Insurance</td>
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<td>1</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Transportation</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Work/school</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Treatment decisions</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Dealing with children</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dealing with partner</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Ability to have children</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Family health issues</td>
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<td>2</td>
<td>2</td>
<td>0</td>
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<tr>
<td>Depression</td>
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<td>2</td>
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<td>3</td>
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<tr>
<td>Fears</td>
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<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Nervousness</td>
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<td>5</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Sadness</td>
<td>4</td>
<td>4</td>
<td>6</td>
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<tr>
<td>Worry</td>
<td>10</td>
<td>6</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Loss of interest</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Spiritual/religious</td>
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<td>0</td>
<td>1</td>
<td>0</td>
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<td>Appearance</td>
<td>2</td>
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<td>4</td>
<td>5</td>
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<tr>
<td>Bathing/dressing</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>Breathing</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Changes in urination</td>
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<td>1</td>
<td>3</td>
<td>1</td>
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<tr>
<td>Constipation</td>
<td>7</td>
<td>5</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Diarrhea</td>
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<td>5</td>
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<tr>
<td>Eating</td>
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<td>4</td>
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NURSE-DELIVERED STANDARDIZED CHEMOTHERAPY

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<th>Symptom</th>
<th>Group 1</th>
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<th>Group 3</th>
<th>Group 4</th>
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<tr>
<td>Total</td>
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<td>15</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Fatigue</td>
<td>10</td>
<td>15</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Feeling swollen</td>
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<td>4</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Fevers</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Getting around</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Indigestion</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Memory/concentration</td>
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<td>6</td>
<td>3</td>
<td>4</td>
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<td>Mouth sores</td>
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<td>Nausea</td>
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<td>Nose dry/congested</td>
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<td>3</td>
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<tr>
<td>Pain</td>
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<tr>
<td>Skin dry/itchy</td>
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<td>6</td>
<td>2</td>
<td>6</td>
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<tr>
<td>Sleep</td>
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<td>7</td>
<td>5</td>
<td>6</td>
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<tr>
<td>Substance use</td>
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<tr>
<td>Tingling hands/feet</td>
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<td>5</td>
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</table>

Patient Satisfaction Survey

Comparison of Group 1 vs. Group 2 total patient satisfaction scores shows patients in Group 2 reported higher satisfaction 16.89 and 19.00 respectively. All patients in Group 2 reported the highest score possible of 5 points. There were seven calls to nurse triage line or visits to office in Group 1 compared with four for Group 2. Patients in Group 1 went to the ED or urgent care more (n = 2) than in Group 2 (n = 1).

Table 4
Satisfaction scores and emergency calls/visits

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<thead>
<tr>
<th></th>
<th>Group 1</th>
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<tbody>
<tr>
<td>Satisfaction Score</td>
<td>M = 16.89, SD = 4.665</td>
<td>M = 19.00, SD = 1.826</td>
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<tr>
<td>Called Nurse Triage Line</td>
<td>n = 7</td>
<td>n = 4</td>
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<tr>
<td>Went to ED/Urgent Care</td>
<td>n = 2</td>
<td>n = 1</td>
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</table>

Patient Survey Comments

Each individual comment written on the patient survey instrument is presented verbatim, and in their entirety, below in Table 5.
Table 5

*Patient survey comments*

<table>
<thead>
<tr>
<th>Patient Satisfaction Comments Group 1</th>
<th>Patient Satisfaction Comments Group 2</th>
</tr>
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<tbody>
<tr>
<td>Nurses are very helpful.</td>
<td>The class was excellent and extremely informative.</td>
</tr>
<tr>
<td>Issues with constipation.</td>
<td>All concerns were answered.</td>
</tr>
<tr>
<td>Too educational.</td>
<td>Handouts were great</td>
</tr>
<tr>
<td>Everything well organized. Nurses very attentive.</td>
<td>Pleasure to go.</td>
</tr>
<tr>
<td>Immune therapy should be separate from chemo.</td>
<td>Learned so much with the questions and answers.</td>
</tr>
<tr>
<td>Nurses very helpful.</td>
<td>Class extremely helpful.</td>
</tr>
<tr>
<td>Patient declined “Very upset I did not go to a class”</td>
<td>Everything has been good.</td>
</tr>
<tr>
<td></td>
<td>I feel very informed.</td>
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**Interpretation/Discussion**

The enhanced education program was created based on observations made for a need to improve standard operating procedures in a large oncology practice in order to reduce anxiety and distress to cancer patients. There was one patient in Group 1 who completed the pre-information but was upset she did not receive group education and declined to complete any further information. The patients who participated in the group program were receptive to receiving education and scheduling the session prior to starting chemo. Many patients brought families and caregivers, which was reported to be helpful. It was noted during the question-and-answer portion of the session that, when a patient asked a question, it was often followed by other patients and family members asking questions. The group setting made for a comfortable environment where patients could feel safe and not rushed.

It is important to discuss that all patients received some type of pre-chemotherapy education as it would be unethical to have a no-education group vs. an education group. Another important observation made regarding higher scores in the pre- and post-scores of both groups is
that patients are likely less distressed when starting Cycle 2 of chemotherapy because they had some familiarity with the process and known expectations. Many may have also had a follow-up appointment with their physician or nurse practitioner and had an opportunity to discuss concerns.

Results of the patient satisfactory survey indicated higher satisfaction among those in the enhanced education group. Questions 5 and 6 of the survey “Did you call the triage nurse or come to the office with a concern about your treatment” and “Did you visit the Emergency Department, Urgent Care or Hospital for an emergent issue regarding your treatment” indicate that patients who received the enhanced educational session called or came to the office less than the group that did not receive this session (36.84% vs. 21.05%). Seven patients in Group 1 either called the nurse triage or visited the office due to adverse effects; of those, six did not attend any group educational session The two patients who did visit the Emergency Room, Urgent Care, or Hospital had not attended any group education. This may indicate that while patients still have similar side effects from chemotherapy, as noted in the PL, when they are provided with education, they are better equipped to handle them at home requiring less intervention.

The cost for treatment of dehydration and/or nausea is approximately $330 per patient. Fewer calls to nurse triage and visits to the infusion center for hydration, anti-emetics, and other treatments reduces costs. This includes reduced chair time in the clinic, nursing services, and supplies. Providing education can be billed under level 1 office visit, for which the fee is approximately $53.00. The amount collected by insurance varies, e.g. Medicare is $21.20. This fee is enough to pay for the cost of materials. Education did not eliminate all potential side effects or need for patients to come to the clinic when appropriate; however, the number of occurrences were reduced through improvement of patient self-efficacy.
While some of the providers of the practice were not immediately receptive to the change in usual practices, the majority did participate by sending their patients to the enhanced education session. The charge nurse, who is responsible for patient education going forward, has adopted this new enhanced educational technique and is using the handbook created for the project. A second office location has also started using the handbook in their office. Ongoing discussion among the physician partners is to now implement a standardized education session for all chemotherapy patients on a regional level. While statistical significance was not met between the means of Group 1 and Group 2 post-test scores in this project, the impact in changing the customary procedure to a program that supports best practice as seen in the literature will prove beneficial to patients.

**Theoretical Outcomes**

The theoretical approach to this DNP QI project, Mishel’s Uncertainty in Illness provided a valuable framework. Throughout the implementation and analysis of the project, application of the theory was found to be relevant. A patient’s perception of a chronic illness can be improved using positive coping resources such as education. Reducing confusion and disorganization early in the trajectory of cancer treatment can assist patients’ outlook on their condition (Zhang, 2017). As found in the patient satisfaction survey and comments, those in the enhanced education group reported a higher level of satisfaction. It’s possible that the tools used for measurement in this QI project were not precise enough in the capturing of anxiety levels related to anticipation of chemotherapy and how education directly reduced those levels. While uncertainty cannot be eliminated, continued efforts to provide a base of knowledge early in the treatment trajectory can allow for better coping and fluidity with change. A patient’s ability to adapt can be improved.
Uncertainty and change can be viewed as something still within their control instead of leading to feelings of danger and helplessness (Mishel, 1990).

**Implications for Nursing**

A theme noted among all the patients that participated in the project is the value of nursing care and the consensus that they were listened to and felt comfortable asking questions. When education was performed in the group enhanced education session verbal comments were in praise of how much the class helped and that they really enjoyed attending. Though the sample size was small in each group fewer calls to nurse triage and visits for urgent care show that empowerment through education equips patients with tools needed for side effect management. This project did not include a nurse satisfaction survey; however, nurses did verbally recognize they appreciated that patients who attended a dedicated group education session were more prepared to start chemo when they came to the infusion center for the first time. Patients that have advanced preparation are better equipped to handle expectations on their first day. Standardizing and improving patient education adds value by providing nursing staff with preprinted, evidence-based resources. This eliminated time nurses would need to spend on locating and printing materials and put less pressure on chemo nurses who carry heavy workloads on a daily basis. The nurses reported that patients who were well prepared also had less anxiety and nervousness. Patients had the chance to review educational material at home and come to chemo with specific questions and concerns instead of starting the education process from the beginning.

**Conclusion**

Anxiety is a common reaction when a patient learns they have cancer and will be starting chemotherapy. Providing patients with a structured educational toolkit that provides both a
verbal session where questions can be addressed as well as written material that can be referenced at home can help to reduce the level of anxiety. The PowerPoint presentation was found to be distracting during the enhanced educational session; however, it may be beneficial if made available upon request electronically or linked on the practice website, thus allowing patients and caregivers to view it at home as an additional resource. Providing patients with appropriate resources about their self-care and potential adverse effects of treatment can potentially lower the severity of adverse effects, allow patients to treat common symptoms at home, and reduce the number of emergency visits to the clinic they will need to make.
References


Fee-Schroeder, K., Howell, L., Kokal, J., Bjornsen, S., Christensen, S., Hathaway, J., ... Vickers, K. S. (2013). Empowering individuals to self-manage chemotherapy side effects. *Clinical
NURSE-DELIVERED STANDARDIZED CHEMOTHERAPY


http://dx.doi.org/10.1188/17.ONF.31-43

Papadopoulou, C., Kotronoulas, G., Schneider, A., Miller, M. I., McBride, J., Polly, Z., ... Maguire, R. (2017). Patient-reported self-efficacy, anxiety, and health-related quality of


Appendix A
Letter of Organizational Support

April 24, 2019

TO WHOM IT MAY CONCERN:

Please be advised that DNP Capstone Project being completed by Michelle Viveiros is a quality improvement project for which the data will be used for the site’s purposes rather than for research.

Andrew Gerrard
Office Manager
## Appendix B
### Literature Review Reference Matrix

<table>
<thead>
<tr>
<th>Author/Design</th>
<th>Hypothesis</th>
<th>n = Setting</th>
<th>Methods/ Measures</th>
<th>Data Analysis</th>
<th>Outcomes/Results</th>
<th>Strengths Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Apor et al. (2018)</td>
<td>In preparation of chemo, understanding potential side effects, goals, treatment schedule, contact info will reduce stress and anxiety, leading to better compliance, quality of life, better outcomes</td>
<td>n = 196</td>
<td>Survey developed to assess effect of specific chemotherapy educational curriculum</td>
<td>Analyses performed with SAS software</td>
<td>Significant increases observed in perceived knowledge of treatment schedule, potential side effects, and use of meds to prevent nausea</td>
<td>S: Data analyzed after one educational session</td>
</tr>
<tr>
<td>Non-experimental</td>
<td>Structured nurse-led chemotherapy educational session 60–90 minutes, family/support encouraged to attend</td>
<td></td>
<td>Ordinal value for multinomial distribution generalized linear model to model random effects analyzing results across time</td>
<td>Reduced generalized anxiety about treatment (p = 0.0294). Completely understand how to take nausea medicine, n = 26 survey 1 vs. n = 130 survey 3 (p &lt; 0.0001)</td>
<td>Conclusion: nurse led chemo after initial physician discussion but prior to starting chemo improves patients</td>
<td></td>
</tr>
<tr>
<td>Grade/Level of Evidence</td>
<td>+ handout given</td>
<td></td>
<td></td>
<td></td>
<td>W: Developed own tool by the Brown University Oncology Research Group (BrUOG) = developed by investigators &amp; reviewed by focus group of practicing</td>
<td></td>
</tr>
<tr>
<td>Level III</td>
<td>1st Survey presented before teaching appointment; 2nd survey before Cycle 1 - 3rd survey before Cycle 2</td>
<td></td>
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<tr>
<td>Quality B</td>
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<tr>
<td>2</td>
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</tr>
<tr>
<td>Study</td>
<td>Design</td>
<td>Objectives</td>
<td>Participants</td>
<td>Methods</td>
<td>Outcomes</td>
<td>Comments</td>
</tr>
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<tr>
<td>Fee-Schroeder et al. (2013)</td>
<td>Quasi-experimental</td>
<td>Instructing patients on side effect management and behavioral strategies to decrease health-related distress, increase coping, reduce anxiety, and promote self-care</td>
<td>n = 81 patients and 15 caregivers</td>
<td>Evidence-based chemotherapy curriculum focused on self-care strategies for side effects. 11 min DVD was created utilizing experts from Mayo Clinic and utilized with a nurse-led group discussion. Post class study immediately following. And n = 42 completed an 8 week follow-up survey.</td>
<td>SPSS was used to summarize data. Descriptive statistics (mean, SD). 65 patients (98%) had increased self-reported understanding of side effects. 98% had increased motivation to use self-care strategies. 100% confidence to manage side effects.</td>
<td>S: n = 31 47% found benefit in the class even though they had started chemo. DVD was inexpensive to create. W: No statistics provided. 31 patients had already begun chemo prior to attending class. No convenience sample. Class was open to anyone who chose, size varied from session to session. Survey not validated.</td>
</tr>
</tbody>
</table>
### Table: Nurse-Delivered Standardized Chemotherapy

<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Patient Education</th>
<th>Methodology</th>
<th>Statistical Analysis</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Gallegos et al. (2019)</td>
<td>Quasi-experimental Level III Quality C</td>
<td>Standard-ization of chemotherapy education improved nurse and patient satisfaction</td>
<td>n = 80 patients pre-intervention&lt;br&gt;n = 84 post intervention&lt;br&gt;n = 30 nurses pre&lt;br&gt;n = 25 post</td>
<td>Questionnaires given to patient cycle 1 day 1 of new treatment&lt;br&gt;Nursing education staff given pre- and post-intervention questionnaires education: pre-chemotherapy checklist for team, group led education class, written material, short video, template in EMR to document</td>
<td>SAS used for descriptive statistics&lt;br&gt;( p &lt; 0.05 )&lt;br&gt;t-test and ANOVA</td>
</tr>
<tr>
<td>4. Garcia (2014)</td>
<td>Integrative Review Level IV Quality C</td>
<td>Question: what is the most effective interventions for anxiety in patients beginning chemotherapy?</td>
<td>n = 10 articles</td>
<td>Literature search of CINAHL, MEDLINE, ProQuest, Joanna Briggs Institute Clinical Online Network for Evidence of Care and Therapeutics, Cochrane Collaboration and Library and National Guidelines Clearinghouse</td>
<td>n/a</td>
</tr>
</tbody>
</table>
### NURSE-DELIVERED STANDARDIZED CHEMOTHERAPY

<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Objective</th>
<th>Sample</th>
<th>Methodology</th>
<th>Findings</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Keener (2018)</td>
<td>Quasi-experimental Level III Quality C</td>
<td>What effect does digitally recorded standardized, pre-chemotherapy teaching methods have on knowledge recall in patients receiving first chemo? What effect on post-treatment anxiety?</td>
<td>$n = 92$ control, $n = 5$ tradition; digital English $n = 75$, digital Spanish $n = 12$</td>
<td>Pretest/posttest design; Intervention group received digitally recorded education of 9-minute recorded presentation (Common side effects, treatment plans, tips for home care, lifestyle changes, chemo admin, what to expect during infusion, team overview, discharge instructions)</td>
<td>SPSS used inferential and descriptive statistics, paired-sample t tests</td>
<td>Anxiety scores lower education for all groups; Significant decrease in tense/worried ($p &lt; 0.001$); All groups knowledge recall improved</td>
</tr>
<tr>
<td>6. Neuss et al. (2017) ASCO guidelines</td>
<td>Purpose to update ASCO/ONS chemo-therapy Admin-istration Safety Standards</td>
<td>Adults and pediatric cancer patients</td>
<td>Updated in 2011 and revised 2013; Joint workshop with stakeholders on 5/12/2015; Extensive literature search included 97 articles for this update</td>
<td>n/a</td>
<td>Education prior to first chemo should include the minimum; Contain both verbal &amp; written information</td>
<td>Industry guideline recommendations; Recently updated</td>
</tr>
</tbody>
</table>
| 7. Milanti (2016) | Psyco-educational therapy integrates psycho-therapeutic and educational interventions can address psychological distress of breast cancer and cervical cancer patients | $n = 100$  
50 intervention group  
50 control group | Pretest/posttest design  
Comparison group not treated with intervention but standard care  
42-minute psycho-educational video while receiving chemo (3 parts: positive reappraisal, education, and relaxation) | SPSS was used for data analysis  
Mann-Whitney U test | Distress mean before the intervention 3.9 (95% CI: 3.41-4.43) and median 4.0 SD 2.58  
In the intervention group the distress level decreased ($p=0.0001$)  
64% had less clinically significant distress after the intervention | S: One intervention was used  
W: Do not know what kind of education the control group had? what is usual care  
Non-probability sampling methods  
Small size  
Short period of time between intervention and post intervention data collection |
|---|---|---|---|---|---|---|
| 8. Mollaoglu (2014) | Planned education can decrease side effects of chemo and improve QOL | $n = 120$  
60 control | C-SAS  
Control group received 3 education sessions:  
Median Mann-Whitney U test and Wilcoxon signed rank test | Statistically significant ($p < 0.05$) decrease in frequency of: | S: Utilized both verbal in person session that include patient |
## NURSE-DELIVERED STANDARDIZED CHEMOTHERAPY

| Quasi-experimental Level II Quality B | 60 exp. | Education = verbal session and 18-page booklet given with session #1  
#1 before 1st chemo (40-45 min session)  
#2 prior to 2nd chemo (30-40 min session)  
#3 before 3rd chemo (no time given)  
C-SAS repeated after 3rd chemo | SPSS used to assess data | Nausea, vomiting, constipation, pain, infection signs, problems of mouth and throat, problems of skin and nails, appetite changes, weight loss/gain, feeling distressed/anxious, feeling pessimistic and unhappy, unusual fatigue, & difficulty sleeping statistically significant decreases in severity of eleven symptoms and discomfort level of nine symptoms & family with a handwritten booklet |

9. Papadopoulou et al.(2017) Longitudinal study Level III Quality B | Patients to receive chemo-therapy \( n = 135 \) | Anxiety was measured prior to first chemo and at the start of each subsequent 6 cycles  
STAI- State Trait Anxiety Inventory and SUPPH Strategies Used by People to Promote Health | Descriptive statistics  
SPSS used  
Longitudinal relationship between HRQOL and self-efficacy scores  
Bonferroni adjusted sig level alpha \( 0.05/20 = 0.003 \) | Significant relationship between self-efficacy (\( p < 0.05 \)) and state anxiety at all time points  
Significant (\( p < 0.05 \)) relationship between self-efficacy and HRQOL scores.  
Higher self-efficacy associated with increases in functioning (physical, emotions,  
S: Findings support empowering of patients to less stress during chemo – enhanced by education  
Specifically mentions use of audio-visual education  
W: Not specifically looking at education |
| Nurse education planned model will improve quality of life and adherence to treatment | n = 140  
70 trial  
70 control | Measure education  
Secondary aim=describe symptoms  
Chemotherapy symptom assessment scale (CSAS)  
About to receive chemo 1st time:  
<Prior to education educational needs were personalized>  
1st session: verbal information given to patient + family 60-65 min  
Booklet provided after the session  
2nd session prior to 2nd chemo 30-45 min  
3rd session prior to 3rd chemo  
CSAS completed 10 days after the 3rd chemo | SPSS software used for data analysis  
Mann-Whitney U, paired samples t, chi-square, Cronbach’s alpha test | Statistically significant changes (p < 0.05)  
Nausea and vomiting, distressed/anxious, feeling pessimistic/unhappy, feeling unusually tired and difficulty sleeping less common in experimental group  
Severity of symptoms  
Nausea/vomiting, distress/anxious, feeling pessimistic/unhappy, feeling unusually tired, and difficulty sleeping less common  
Degree of discomfort nausea/vomiting, distressed/anxious, feeling pessimistic unhappy, feeling | S:  
Used verbal teaching and a booklet  
W:  
3 education session time consuming  
Intervention not checked after first session before 2nd chemo |
| 11. Sahin (2016) | Patients can manage treatment related symptoms through educational interventions to improve outcomes such as QOL and health status | $n = 120$  
60 exp.  
60 control  
All with stages I-III breast cancer | Educational intervention conducted prior to first cycle  
Pre-test & post test  
Verbal education session 50-55 minutes  
Booklet provided at the end of session  
2nd session prior to 2nd cycle 35-45 minutes  
3rd session prior to 3rd cycle – patients and family  
CSAS completed 10 days after 3rd chemo and QOL index | SPSS used to analyze data  
Statistically significant ($p < 0.05$)  
X2 test or Fisher exact test  
Mann-Whitney U test  
Paired t test  
CSAS and Quality of Life Index-Cancer Version | Usually tired, and difficulty sleeping were lower  
Symptoms distress/anxiety, feeling pessimistic/unhappy, feeling unusual tired, and difficulty sleeping less common in posttest experimental group ($p < 0.05$)  
Degree of discomfort distress/anxiety, feeling pessimistic/unhappy, and difficulty sleeping lower in posttest exp group ($p < 0.05$)  
Conclusion patients in the intervention group had higher overall QOL | S:  
Booklet details: pharm/non-pharm info on chemo, common adverse effects  
Only used 1 interventional session  
W:  
Sample only breast cancer patients |
| 12. Yuce (2017) | Does education have an effect on prevention of oral mucositis and improve QOL? | $n = 60$  
30 educ. group  
30 control group | Instruments used;  
Scale for Assessing Quality of Life in Cancer Patients  
and  
Oral Assessment Guide | Chi-square analysis, Mann-Whitney U Test, number, percentage, mean, standard deviation, median $p < 0.05$ | Statistically significant difference between education group and control group on degree of mucositis (days 5, 10, 15 & 21) | S:  
Oral mucositis common among some chemo. (37%)  
Randomized controlled trial  
W: |
| Patient education booklet created by researchers (nutritional recommendations, recommendations for dryness, recommendations on issues of taste, smell changes, use of oral hygiene) Routine nursing recommendations in another group Oral Assessment Guide days 5, 10, 15, 21 | Statistically significant difference education group and control group experiencing reduced saliva (5th day) Difficulty swallowing (5th day) Deterioration of taste (5th day) Avg. functional scores (QOL) significant difference (p = 0.017) | Small study size Focused on education and outcomes of one specific side effect |
Appendix C
Written Education Materials

Chemotherapy
Patient Resources
## Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Information &amp; Contact</td>
<td>2</td>
</tr>
<tr>
<td>Preparing for Chemotherapy &amp; Frequently Asked Questions</td>
<td>3</td>
</tr>
<tr>
<td>Urgent Calls</td>
<td>5</td>
</tr>
<tr>
<td>Internet Resources and Websites</td>
<td>5</td>
</tr>
<tr>
<td>Treatment Plan</td>
<td>6</td>
</tr>
<tr>
<td>Information About Implanted Ports</td>
<td>7</td>
</tr>
<tr>
<td>Understanding Your Blood and Blood Counts</td>
<td>8</td>
</tr>
<tr>
<td>Fatigue</td>
<td>9</td>
</tr>
<tr>
<td>Hair Loss</td>
<td>9</td>
</tr>
<tr>
<td>Anemia &amp; Thrombocytopenia</td>
<td>9</td>
</tr>
<tr>
<td>Neutropenia &amp; On Body Injector</td>
<td>10</td>
</tr>
<tr>
<td>Reducing Risk of Infection</td>
<td>10</td>
</tr>
<tr>
<td>Mouth Sores</td>
<td>10</td>
</tr>
<tr>
<td>Taste Changes, Nausea, Vomiting &amp; Diarrhea</td>
<td>11</td>
</tr>
<tr>
<td>Constipation</td>
<td>12</td>
</tr>
<tr>
<td>Pain &amp; Peripheral Neuropathy</td>
<td>12</td>
</tr>
<tr>
<td>Hand Foot Syndrome</td>
<td>13</td>
</tr>
<tr>
<td>Skin Changes</td>
<td>13</td>
</tr>
<tr>
<td>Immune Therapy</td>
<td>14</td>
</tr>
<tr>
<td>Sexuality &amp; Birth Control</td>
<td>14</td>
</tr>
<tr>
<td>References</td>
<td>15</td>
</tr>
</tbody>
</table>
Phone Numbers

Main Number (352)555-1212
   Includes after hours and weekends
Nurse Triage Line
   Includes medication refills (352)555-1213
Billing Questions (352)555-1214
Appointment Questions (352)555-1215
Pharmacy (800)123-4567

Website
For support, clinical trial, care management info: Flcancer.com

After Hours Calls
After hours will reach answering service.
Your call will be returned by either the physician or nurse practitioner or PA on call.

Provide the following:
1. your diagnosis
2. chemotherapy you are receiving
3. date of your last chemo
Preparing for Chemotherapy

Frequently asked questions

Q: When should I arrive for my appointment?
A: Please arrive at your scheduled time. Arriving earlier does not mean you will be seen earlier

Q: What should I bring to occupy my time?
A: You may bring: tablets, books, newspapers, magazines or any reading material. Please use headphones or ear buds so as not to disturb other patients. ALL CELLPHONES SHOULD HAVE RINGER SILENCED

Q: Can I bring food or drinks?
A: We provide light snacks (peanut butter crackers & cookies), juice, water, and ginger ale. You may bring other drinks & snacks with you.

Q: Can I bring a blanket or pillow?
A: We will provide you warm blankets and have a pillow. If you prefer you may bring your own from home. The treatment room is kept at 70° F.

Q: Should I take my regular medications before coming?
A: Unless otherwise advised by your oncologist you may take all your home medications
Q: **What is an infusion reaction?**

A: Symptoms of a reaction include: itching, rash, hives, chills, headache, muscle pains, dizziness, sweating, nausea/vomiting, cough, shortness of breath, chest tightness, increase or decrease blood pressure, increase heart rate, feeling like throat is closing, numbness of extremity or tongue. LET YOUR NURSE KNOW IMMEDIATELY.

Q: **Can I bring friends or family with me?**

A: Every patient can bring one family member/friend with them to the treatment room. However, if space is limited and the chair is needed for a patient, we will ask the family/friend to return to the waiting room until a chair is available.

Q: **What is the WIFI information?**

A: Network: FCSguest
   Password: fcsnet08

**Other common questions to ask:**

Will I lose my hair? _____________________________________________________________

Is there any medications I should avoid? ____________________________________________
   _____________________________________________________________
   _____________________________________________________________

Can I swim in a pool? __________________________________________________________

Can I exercise? _______________________________________________________________

Do I need to wear a mask or gloves? ____________________________________________
When to contact the office & urgent calls:

- Chest pain – Call 9-1-1
- Fever – temperature more than 100.5
- Excessive shaking or chills
- Uncontrolled vomiting – more than 4 times in 24 hours
- Bruising or bleeding
- Dizziness or light-headed
- Blood in urine or stools
- Severe constipation (no bowel movement for 3 days) or diarrhea not managed by over the counter anti-diarrheal medication
- Urinary pain, frequent urination, inability to urinate
- Extreme fatigue (example – unable to perform regular Activities of Daily Living such as fixing a meal, getting dressed, using the restroom)
- New pain location
- Headache not relieved by ibuprofen or acetaminophen
- Mouth sores
- Unable to eat or drink
- A brand-new symptom
- Rash

Internet Resources

Chemotherapy and side effects, Cleveland Clinic – www.Chemocare.com
National Comprehensive Cancer Network (NCCN) patient resources www.NCCN.org
Your Treatment Plan

Cancer type/location/histologic type:________________________________________________________

_________________________________________________________

Treatment goal:_____________________________________________

Chemotherapy:_______________________________________________

____________________________________________________________

____________________________________________________________

Time expected per treatment:

1st treatment: _______________________________ 

Consecutive treatments: _________________________________

Frequency: _________________________________

Medications to take at home before treatment:

(Ex: if you treatment includes Alimta or Taxotere you should be prescribed dexamethasone the day before and after chemo)

____________________________________________________________

____________________________________________________________

____________________________________________________________

Prescriptions given:

____________________________________________________________

____________________________________________________________

____________________________________________________________

____________________________________________________________

(6)
Port Information

What is a port?
Device implanted under the skin by a surgeon or radiologist
Small disc shape – quarter sized
Can be used to draw blood
Can be used for chemotherapy and other medications

Care of port
Will be flushed each treatment
Flushed every 4-8 weeks when not in use
Understanding Your Blood Count

3 Main types of blood cells:

<table>
<thead>
<tr>
<th>Name</th>
<th>Normal Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Red Blood Cells</strong> (RBC)</td>
<td></td>
</tr>
<tr>
<td>Hemoglobin (Hgb)</td>
<td>12-16</td>
</tr>
<tr>
<td>Hematocrit (HCT)</td>
<td>37-47%</td>
</tr>
<tr>
<td><strong>White Blood Cells</strong> (WBC)</td>
<td>4.2-10</td>
</tr>
<tr>
<td>Absolute Neutrophil Count (ANC)</td>
<td>1.5-6.5</td>
</tr>
<tr>
<td><strong>Platelets</strong></td>
<td>140-440</td>
</tr>
</tbody>
</table>

Common terms:
Anemia – Low Red Blood Cells
Neutropenia - Low White Blood Cells
Thrombocytopenia – Low Platelets
Side Effect Management of Symptoms

Fatigue:
- Space out activities and use rest periods
- Good nutrition
- Stay hydrated – drink 8-10 glasses fluids daily (decaffeinated drinks)
- Engage in light to moderate activity daily such as walking
- Rest when needed

Hair Loss Due to Chemotherapy
- Will vary depending on type of chemotherapy
- Will start to fall out around 14 days after first chemotherapy
- May choose to cut hair short
- Eyelashes and eyebrows may fall out
- May cause scalp tenderness
- Plan to shop for a wig before you start treatment if possible
- May grow back different texture or color

Anemia – Low Red Blood Cells
- Symptoms may include: fatigue, shortness of breath, dizziness, lightheadedness, fast heart beat
- Things you can do: Get up slowly, rest often when needed
- Good nutrition

Thrombocytopenia – Low Platelets
- Platelets help blood to clot
- When low at risk for bleeding
- Signs of low platelets: easy bruising, small pinpoint red spots on skin, blood in urine, blood in stools (black stools), bleeding from gums or nose
• Things you can do to prevent injury: use a soft bristle toothbrush, blow nose gently, use an electric razor, avoid contact sports, avoid using enemas, rectal suppositories, keep stools soft
• If injury or bleeding apply pressure to area

Neutropenia – Low White Blood Cells
• White blood cells fight infection
• Signs of infection include: temperature greater than 100.5 F, chills, sweats, cough, coughing up secretions, mouth sores or white patches in mouth or tongue, burning/pain with urination, redness or pain and swelling of skin, pus or drainage
• May require injections to stimulate growth of white blood cells or an on-body injector may be placed on you after your chemo

How to Reduce Risk of Infection:
• Avoid those with colds or illness
• Consult with physician before getting any vaccinations or dental work
• Avoid large crowds if possible
• Wash hands frequently
• Brush teeth and good oral care
• Wash fresh fruits and vegetables
• Wear gloves when cleaning animal cages, fish tanks, cat litter, yard work

Mouth Sores
• Use a soft bristled toothbrush and replace regularly
• Avoid spicy or acidic foods
• Avoid mouthwash that contains alcohol
• May rinse with salt and baking soda after meals and at bedtime (1 cup warm water, ¼ tsp. baking soda, 1/8 tsp. salt) – Rinse & spit
• Remove and clean dentures well
• Use lip balm and keep mouth and lips moist
• Sip water or ice chips

(10)
**Taste Changes/Changes in Appetite**

- Eat frequent small meals (5 or 6 small meals instead of 3 large meals)
- Choose foods high in calories and protein
- If food has metallic taste, try plastic utensils
- Eat with friends/family
- Drink soups or milkshakes that are easy to swallow
- Food diary: Write down how much you eat and drink each day

**Nausea & Vomiting**

- Eat small frequent meals for 24-48 hours after chemotherapy
- Avoid spicy, fried, or fatty foods.
- Avoid alcohol or acidic foods (orange, grapefruit, tomato)
- Suck on ice chips or popsicles
- Do not lie down right after eating
- Take prescribed medications for nausea
- May also use: Maalox, Mylanta, or TUMS for upset stomach/indigestion
- Wait 40-60 minutes after taking nausea medications before eating

**Diarrhea**

- 4 or more loose watery stools in 1 day
- Drink 8-10 glasses of liquids daily (water, ginger ale, Gatorade, decaffeinated tea, broth, jello)
- Use loperamide 4mg followed by 2mg every 4 hours: MAX 8 tabs in 1 day
- Follow the BRAT diet: bananas, rice, apple sauce, tea/toast
- Foods that may worsen diarrhea: Milk products, greasy/spicy foods, caffeine, chocolate
- Herbs/supplements that may worsen diarrhea: magnesium, fish oil, cat’s claw, garlic, flaxseed, high dose Vit C, aloe
- call office if diarrhea does not resolve in 24 hours
Constipation

- Decrease in number of stools, hard or dry stools, straining
- Increase foods with fiber (vegetables, fruits, bran, raisins, whole grain cereals)
- Add prunes or prune juice to diet
- Drink at LEAST 8 glasses water daily
- Increase exercise such as walking
- If no bowel movement in 2 days: Use a stool softener docusate sodium (100-300mg/day) and Senna (2-6 tablets twice daily) increase or decrease until you have a good bowel movement every 1-2 days.
- If bowels become loose stop the pills until more firm and start again at lower dose
- May also take Milk of Magnesia 2-4 tsp. at bedtime

Pain

- Treatment may include Tylenol, Ibuprofen (if not contraindicated by other conditions, check with your provider)
- Other prescription medications

Peripheral Neuropathy

- Pain due to irritation of nerve endings in hands or feet
- Burning, numbness, tingling or loss of coordination
- Avoid extreme temperatures
- If you are receiving oxaliplatin avoid cold temperatures or objects for 5-7 days after treatment, may need to wear gloves to reach inside refrigerator, drink room temperature or warm liquids
- Don’t drink alcohol
- Physical therapy may help with balance
- May need prescription medications – ask your physician
- Non-drug treatments: massage, physical therapy, acupuncture or relaxation

(12)
Hand-Foot Syndrome

- Known as palmar-plantar erythrodysesthesia
- Caused by some types of chemotherapy
- Signs include: Tingling, burning, redness, flaking, peeling, swelling, rash, small sores or blisters, cracking
- Affects palms of hands and soles of feet
- Call physician or nurse
- Avoid direct sunlight or wear sunscreen
- Shower or baths in lukewarm water
- Mild soaps
- Apply mild creams: Udderly smooth, Bag Balm, Eucerin, Aveeno or Lubriderm
- Apply antibiotic ointment if prescribed
- May be recommended to take Vitamin B6 100mg three times daily for 1 week, then 50mg three times daily until treatment is completed

Skin Conditions

- Skin may become more sensitive
- Rashes may develop
- More sensitive to sun
- Things that may help: Drink 8-10 glasses water daily, use mild soap and lotions, use sunscreen, pat dry instead of rubbing, nail polish may strengthen nails, keep nails short
- Call your doctor or nurse

Skin Conditions When Taking Targeted Therapy (EGFR)

- Examples of EGFR medications (Erbitux, Vectibix)
- Rash that may look like acne
- Red or inflamed skin
- Dry skin, cracks in skin, or crusting
• Skin around nails tender, red and swollen
• Tips to help: mild soaps (Ivory, Dove, Aveeno), gentle moisturizer (Udderly Smooth, Aveeno, Eucerin, Cetophil, Lubriderm), avoid sun
• Call your physician or nurse

Immune Therapy Common Side Effects

• Examples of Immune Therapy (Opdivo, Keytruda, Imfinzi)
• Skin reaction (redness, blistering, dryness)
• Flu like symptoms (tired, chills, weakness, body aches)
• Let your doctor or nurse know if you have any of the following:
  a. New or worse cough
  b. shortness of breath or chest pain
  c. yellowing of the skin
  d. severe nausea/vomiting
  e. dark urine
  f. diarrhea
  g. blood in stools, dark stools, tarry stools
  h. unusual headaches, changes in mood, confusion
  i. blisters on skin or ulcers in the mouth

Birth Control and Sexuality

• Temporary or permanent infertility and sexual dysfunction may result from chemotherapy
• Discuss concerns about sexual issues and fertility with your physician or nurse
• Always use a method of birth control
• Females may use lubrication (Astroglide, Refresh or other non-hormonal lubricant) for vaginal dryness.
References


Appendix D
Measurement Tools

NCCN Distress Thermometer and Problem List

NCCN Distress Thermometer and Problem List for Patients

<table>
<thead>
<tr>
<th>Extreme distress</th>
<th>No distress</th>
</tr>
</thead>
</table>

Instructions: Please circle the number (0–10) that best describes how much distress you have been experiencing in the past week including today.

PROBLEM LIST
Please indicate if any of the following has been a problem for you in the past week including today. Be sure to check YES or NO for each.

YES NO Practical Problems
- Child care
- Housing
- Insurance/financial
- Transportation
- Work/school
- Treatment decisions
- Family Problems
- Dealing with children
- Dealing with partner
- Ability to have children
- Family health issues
- Emotional Problems
- Depression
- Fears
- Nervousness
- Sadness
- Worry
- Loss of interest in usual activities
- Spiritual/religious concerns

YES NO Physical Problems
- Appearance
- Bathing/dressing
- Breathing
- Changes in urination
- Constipation
- Diarrhea
- Eating
- Fatigue
- Feeling swollen
- Favors
- Getting around
- Indigestion
- Memory/concentration
- Mouth sores
- Nausea
- Nose dry/congested
- Pain
- Sexual
- Skin dry/itchy
- Sleep
- Substance use
- Tingling in hands/feet

Other Problems: ____________________________
Appendix E
Theoretical Framework

Mishel’s Theory of Uncertainty in Illness

- perception of illness
  - threat vs. opportunity

- stimuli/diagnosis
  - expectations
  - coping/support systems

- strategies
  - information gathering
  - blocking/avoidance

- new balance
- new life view
- adjustment

Adaptation to the illness

Antecedents generating uncertainty

Coping with uncertainty

Appraisal of uncertainty
Appendix F
IRB Approval

UMassAmherst
Human Research Protection Office

Memorandum – Not Human Subjects Research Determination

Date: September 17, 2019

To: Michelle Viveiros, College of Nursing

Project Title: Using Education to Reduce Distress

IRB Determination Number: 19-151

The Human Research Protection Office (HRPO) has evaluated the above named project and has made the following determination based on the information provided to our office:

☐ The proposed project does not involve research that obtains information about living individuals [45 CFR 46.102(f)].

☐ The proposed project does not involve intervention or interaction with individuals OR does not use identifiable private information [45 CFR 46.102(f)(1), (2)].

☒ The proposed project does not meet the definition of human subject research under federal regulations [45 CFR 46.102(d)].

Submission of an Application to UMass Amherst IRB is not required.

Note: This determination applies only to the activities described in the submission. If there are changes to the activities described in this submission, please submit a new determination form to the HRPO prior to initiating any changes.

A project determined as “Not Human Subjects Research,” must still be conducted in accordance with the ethical principles outlined in the Belmont Report: respect for persons, beneficence, and justice. Researchers must also comply with all applicable federal, state and local regulations as well as UMass Amherst Policies and procedures which may include obtaining approval of your activities from other institutions or entities.

Please do not hesitate to call us at 413-545-3428 or email humansubjects@ora.umass.edu if you have any questions.

Iris L. Jenkins
Assistant Director
Human Research Protection Office
Appendix G
Patient Satisfaction Survey Tool

Please circle the number that best fits your satisfaction with the education you received about your chemotherapy treatment.

5 is the highest score; 1 is the lowest.

Did you feel you received enough information before starting your chemo?

| 5 | 4 | 3 | 2 | 1 |

Materials provided were easy for you to understand.

| 5 | 4 | 3 | 2 | 1 |

Enough time was spent on education.

| 5 | 4 | 3 | 2 | 1 |

You felt all your questions were addressed.

| 5 | 4 | 3 | 2 | 1 |

Please answer the following Yes or No

Did you call the triage nurse or come to the office with a concern about your treatment?

Yes  | No

Did you visit the Emergency Department, Urgent Care or Hospital for an emergent issue regarding your treatment?

Yes  | No

Other comments you would like to share about the educational process:

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Thank you for your participation.
Appendix H
Cost Analysis

Costs of proposal

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 RN/charge nurse</td>
<td>$36/hour</td>
</tr>
<tr>
<td>2 hours training</td>
<td>$72.00 (one-time cost)</td>
</tr>
<tr>
<td>Printing costs</td>
<td>$0.42 per page</td>
</tr>
<tr>
<td>20 pages (estimate)</td>
<td>$8.40</td>
</tr>
<tr>
<td>Estimated patients/week</td>
<td>10</td>
</tr>
<tr>
<td>$8.40</td>
<td>$84.00</td>
</tr>
<tr>
<td>Estimated annual cost</td>
<td></td>
</tr>
<tr>
<td>$8.40</td>
<td>$4368.00</td>
</tr>
</tbody>
</table>

Estimated cost of supportive care for one episode

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Complete Blood Count (CBC)</td>
<td>1</td>
</tr>
<tr>
<td>1-hour intravenous infusion time</td>
<td>1</td>
</tr>
<tr>
<td>Each additional hour</td>
<td>1</td>
</tr>
<tr>
<td>Antiemetic (example Zofran)</td>
<td>8mg x 1</td>
</tr>
<tr>
<td>Steroid (example Decadron)</td>
<td>10mg x 1</td>
</tr>
<tr>
<td>1-liter normal saline</td>
<td>1</td>
</tr>
<tr>
<td>Total cost</td>
<td></td>
</tr>
</tbody>
</table>