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Standardized Patient Education for Patients' Initial Chemotherapy through an Integrated Telemedicine Platform

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APPROVAL FOR SUCCESSFUL DEFENSE

Karen D. Dougherty has successfully defended and made the required modifications to the text of the DNP Final Scholarly Project for the Doctor of Nursing Practice during this Spring, 2023

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Dedication

I dedicate this work to my loving parents, the late Stanley and Beatrice Dombrowski, who have supported me in my journey as a student. Throughout my formal education, they have inspired me with the resilience to persevere to succeed.

To my sister Christine, who lovingly supports me in all I do. There were never such two devoted sisters. To my husband Joe, who challenges me daily and reminds me of the humor in life. Thank you for being a pillar of strength and words of encouragement. Throughout our adventure together, the best is yet to come. To my articulate daughter Colleen, with her keen sense of command of the written word and exceptional analytical skills. I thank for being my editor. To my son Joseph, with his wry sense of humor, who makes me laugh, especially when reminding me of the irony in life. To my daughter, Erin, who inspires me as she completes her master's in nursing as a second degree. I stand in awe as she juggles her daily life with her ever-loving supportive husband, Daniel, a home, a job, and two beautiful baby girls, Norah Grace, and Claire Elizabeth.

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TABLE OF CONTENTS

Abstract

Telemedicine has demonstrated a high level of satisfaction in a variety of health settings as a safe and efficient method of delivering healthcare. The purpose of this project was to implement an Advanced Practice-led Quality Improvement (QI) initiative pilot to evaluate the standardization of chemotherapy education through an integrated telemedicine platform. This Doctor of Nursing Practice (DNP) project used interventions noted in the literature review to assess and evaluate core concepts of knowledge, satisfaction, utilization, and program acceptance. This project aimed to utilize evidence-based processes to increase knowledge about the chemotherapy treatment routine, to raise awareness and develop skills to manage side effects related to treatment and to improve patient satisfaction.

In this pilot, observational data were collected and analyzed in an outpatient setting at a large, multistate comprehensive cancer center. Patient survey data for this QI project showed that among participants (n=10) who completed the Patient Satisfaction Survey, 93% agreed positively about Ease of Access to the telemedicine dashboard. Overall, 100% agreed positively about Satisfaction with the Information and Materials received. Participant scores revealed 98% agreed that the class prepared them for their first chemotherapy. Eight of ten participants agreed that the class prepared them to better manage potential chemotherapy side effects.

The staff participant satisfaction rate was 86% with a positive response regarding telehealth and its perceived efficacy. Staff participants agreed that standardized patient education decreases practice variability and increases efficiency. The findings suggest that telemedicine can be used successfully to deliver quality care education for patients receiving chemotherapy.

Keywords: patient education, cancer, oncology, standardized, multimedia, telemedicine, telehealth, knowledge, low health literacy, and technology-enhanced learning

Background

Definition of Terms

Doctor of Nursing Practice (DNP): A terminal degree in the field of nursing.

Information Technology (IT): The use of hardware, software, services, and supporting infrastructure to manage and deliver information using voice, data, and video.

Quality Improvement (QI): Quality improvement is the systematic approach that is guided by data to improve the quality and safety of healthcare delivery.

SWOT Analysis: A strategic planning and management technique utilized to identify Strengths, Weaknesses, Opportunities, and Threats related to business project planning analysis.

Telemedicine: Telemedicine, as defined by Centers for Medicare and Medicaid Services, is two-way audio-video communication between a physician or other health care provider and a patient (Menhrotra et al., 2020).

Telehealth: Telehealth is defined by the Telehealth Resource Center as a collection of means or methods for enhancing the health care, public health, and health education delivery and support using telecommunications technologies (Paterson et al., 2020; Shirke et al., 2020).

Description of Project

This was a DNP quality improvement (QI) pilot initiative focused on the standardization of chemotherapy education through an integrated telemedicine platform in an outpatient setting at a large, multistate comprehensive cancer center. The COVID-19 pandemic has transformed cancer care with the rapid expansion of telemedicine. Telemedicine uses telecommunications technology as a tool to deliver health care to populations with limited access to care (Institute of

Medicine, 1996). Telemedicine offers access to supportive oncology services. As the oncology community compiles data on experiences with billable telemedicine, unbillable work performed by nurses and supportive oncology team members essential to care of the patient is lacking. Data is essential to determine whether telemedicine could offer increased access to these essential services. This novel approach to health care delivery to improve efficiency and quality of care remains consistent with the core competencies defined by the Institute of Medicine dimension of quality (Institute of Medicine, 2001).

Purpose of Project

The purpose of this quality improvement (QI) pilot project was to evaluate a standardized chemotherapy education program delivered over an integrated telemedicine platform. This project aimed to utilize evidence-based processes to increase knowledge about the chemotherapy treatment routine, and to raise awareness and develop skills to manage side effects related to treatment, while improving patient satisfaction. The standardized chemotherapy education plan identifies educational resources available for patients and caregivers. The core concepts of assessing knowledge, satisfaction, utilization, and program acceptance were evaluated. The goal is that data analysis from the project would support a request for a practice policy change to allow use of standardized education delivered via telemedicine platform as an educational model of chemotherapy teaching.

Program Objectives

To aid in the evaluation, the primary objectives of the project were:

- Develop and implement a standardized educational program to provide patients and caregivers with information about chemotherapy treatment routine.

- Create a Pre-Test and Post-Test with analysis to determine if class prepared patients for first chemotherapy.
- Determine if class prepared patients to better manage potential chemotherapy side effects.
- Gather and analyze data on perceived satisfaction and efficacy with increase quality outcomes of the chemotherapy education process.

To aid in the evaluation, the secondary objectives of the project were:

- Gather and analyze data on perceived satisfaction of registered nurse providers about telemedicine.
- Reduced practice variability.
- Increase and sustain patient education utilization of telemedicine by registered nurse providers.

Goals

Specific measurable goals of this quality improvement pilot project were:

1. Show by survey that the program was accepted by at least 70% of staff and supported improved patient care.
2. Increase patient perceived satisfaction with the telemedicine program to a rate of 95% or higher.
3. Show by survey that the class prepared patients for the first chemotherapy to a rate of 95% or higher.
4. Show by survey that the class prepared patients to better manage potential chemotherapy side effects to a rate of 95% or higher.

Significance of the Project

Prior to the initiation of this project, there was no standardized chemotherapy education delivery component at the institution apart from established curriculum materials. The lack of standardization in delivery of chemotherapy educational practices can lead to inefficient and ineffective education for patients preparing for chemotherapy. Chemotherapy education is typically provided to patients prior to the first chemotherapy treatment as an individual session by a primary office practice registered nurse. Current practice includes the educational session at the time of the initial consultation. Each nurse has a unique approach to chemotherapy education with multiple tools and resources to educate patients. There is marked variation that exists in the delivery of chemotherapy educational telemedicine given the adoption of individual smartphone technology such as Doximity®, Cisco Jabber®, and FaceTime® telemedicine visits during the COVID-19 pandemic. Recent literature highlights that using telehealth during COVID-19 pandemic was beneficial to patients and increased access to care (Mills et al., 2020; Shaverdian, et al, 2020). Using various telehealth formats contributed to dissatisfaction among patients and nursing staff. Eliminating variation in process and standardizing chemotherapy educational processes through detailed planning of educational content and training for oncology office practice nurses has been linked to improved patient satisfaction, increased knowledge of side effects related to chemotherapy, and increased efficacy of nursing staff regarding time and quality of care to patients (Dalby, Nesbitt, Frechette, Kennerley, Lacoursiere & Buswell, 2013; Thompson, Sillman & Clifford, 2013). With the development of an integrated, system-wide telemedicine platform in place, the opportunity to optimize its utility became available with the incorporation of patient education via a telemedicine program. The expected benefits of the clinical program are that it will bring opportunities to improve patient and caregiver education,

educate the nursing staff on evidence-based guidelines and utilize technology to deliver evidence-based interventions to educate patients to better understand the chemotherapy process and the improve symptom management. It will be important to evaluate telemedicine services over time with meaningful metrics with patient expectations and acceptance of telemedicine interventions to encourage payers to cover services deemed appropriate (Kircher et al., 2020).

Review of Literature

A literature review was conducted to provide the synthesis of research development of the most current and relevant results. Search methods included CINHAL (Cumulative Index to Nursing and Allied Health Literature 2009-2019), MEDLINE (United States National Library of Medicine 2009-2019), PubMed, The Cochrane Library, and ERIC (Proquest). A literature review identified relevant study types: randomized control trials, cross-sectional study design, and one combination of qualitative design/quantitative design.

A comprehensive search of English-language studies regarding a multimedia, computer-based approach compared to printed education intervention and its effects and attitudes about standardized patient education conducted via a telemedicine platform revealed many recent studies have focused on the problem of effectiveness of internet-based interventions, and interventions to standardize and improve chemotherapy education. Studies show that there is a gap in the literature regarding patient satisfaction with telemedicine versus clinic visits. Few researchers have taken telemedicine into consideration when presenting a standardized chemotherapy educational class and patient satisfaction.

Apor et al. (2018) evaluated the effect of a nurse-led education chemotherapy teaching session on patients' knowledge, anxiety, and preparedness for cancer-directed therapy. Apor et al. (2018) found significant increases observed in patients' understanding of their treatment schedule, potential adverse effects, and antiemetic medication regimen by the first cycle of therapy and a reduction in treatment-related anxiety by the second cycle of therapy.

In a randomized control study, Bol et al. (2013) investigated the effects of personalized audiovisual information in addition to text on website satisfaction and recall of cancer-related online information in older lung cancer patients. Bol et al. (2013) enrolled 231 participants and

performed an experiment using a 3 (condition: text only vs. text with non-personalized video vs. text with personalized video) by 2 (age patient: younger [<65 yrs] vs. [older ≥ 65yrs]) between-subjects factorial design was conducted. Patients were randomly assigned to one of the three information conditions stratified by age group. Patients were more satisfied with the comprehensibility, attractiveness, and the emotional support from the website when information was presented as text with personal video compared to text only. Text with personalized video also outperformed text with non-personalized video regarding emotional support from the website. Furthermore, text with video improved patients' recall of cancer-related information as compared to text only. Internet use plays an important role in explaining recall of information (Bol et al., 2013).

In this qualitative study, Brockbank et al. (2015) describe patients' views on pretreatment information regarding changes to eating, drinking, and swallowing after chemoradiotherapy treatment for head and neck cancer (HNC). A sample of 24 patients with HNC with a range of posttreatment dysphagia severity, up to two years after chemoradiotherapy was selected to participate in focus groups or semi-structured interviews. Data were grouped into three-main themes and subthemes: expectations about treatment outcomes, and whether information correlated with pretreatment information; preparation of information, including the format and delivery; and the difficulties with absorption and retention of information. Brockbank et al. (2013) concluded that patients require information on the impact and prognosis for their swallowing ability. There was a general preference for verbal information from someone knowledgeable about dysphagia. However, there were also individual preferences for the manner and pace at which this information is delivered. Further research is indicated to explore ways of providing information that is individually tailored to patients' needs and preferences.

Coster et al. (2020) identified 63 reviews that provide inadequate evidence of the effectiveness of interventions designed to improve patients' knowledge and skills to manage chronic disease, with reference to nursing contribution and practice. Information on the profession of the person delivering the intervention was often not available, although 78% (n=49) of the reviews mentioned that nurses were involved in a portion of studies delivering interventions either independently or as part of a multi-professional team. Coster et al. (2020) conclude that educational programs have definite benefits for patients suffering from asthma, chronic obstructive pulmonary disorder, and stroke, and are promising in areas such as diabetes, epilepsy, cancer care, and mental health. However, it is still not clear what the active ingredients of many successful interventions are. Access to self-management has increased through web-based smartphone programs, but research on their effectiveness and optimal ways of delivering them is in its infancy.

Dalby et al. (2013) recognized that each nurse approaches patient education differently by employing a quality improvement strategy to develop a standardized approach to patient education. The goal was to eliminate variation in teaching and improve satisfaction scores. Eliminating variation in process and standardizing chemotherapy education practices through detailed planning of educational content and training for oncology office practice nurses has been linked to improved patient satisfaction, increased knowledge of side effects related to chemotherapy, and increased efficacy of nursing staff regarding time and quality of care to patients (Dalby et al., 2013).

In this randomized controlled trial, Ferguson et al. (2015) evaluated an educational intervention to improve knowledge of hearing aids and communication in 203 first-time hearing aid users. This intervention was based on the concept of reusable learning objects (RLOs). RLOs

were delivered online and through DVD for television and personal computer. Ferguson et al. (2015) found knowledge of both practical and psychosocial issues was significantly higher in the group that received the RLOs than in the control group. Ferguson et al. (2015) conclude that an interactive multimedia educational intervention that supplements clinical practice results in improved knowledge in first-time hearing aid users. This randomized clinical trial supports the usage and optimization of the integrated telemedicine dashboard to deliver a reusable learning object (RLO).

In an integrative review, Garcia (2014) identified nine studies that have shown patient education is effective in decreasing anxiety in patients newly diagnosed with cancer who are receiving chemotherapy. Five consistencies were identified within these articles: specific education topics that decrease anxiety include information about treatment, side effect management, and a brief orientation to the chemotherapy setting; education is most effective in preventing and managing anxiety when performed prior to the initiation of chemotherapy; format of patient education is important to maximize retention of information; education is most effective when performed in a quiet environment that supports learning; and oncology nurses in primary oncology setting are effective providers of patient education.

In this single-blind, randomized, stratified clinical trial, Green et al. (2017) evaluated the use of a preoperative patient education video as an adjunct to preoperative counseling on patient preparedness. Of the 100 recruited patients, 52 were randomized to the video group and 48 to the usual-care group. Green et al. (2017) found the use of the video did not increase overall preparedness (71.1% with video vs 68.8% usual care, P=.79) prior to surgery. The use of the video did not decrease the amount of time spent during the physician-patient encounter (16.9 +/- 5.6 min vs 17.1 +/- 5.4 min, P = .87). There was significant association between patient

preparedness and perception that the health care team spent sufficient time with the patient (89.5% vs 10.5% P <.001), but no association was observed between preparedness and actual time spent. Greater preparedness was associated with patient perception of how much time the health care team spent with the patient, but not actual time spent.

In a longitudinal design study conducted over four time points, Halkett et al. (2012) surveyed 123 women to prioritize breast cancer patients' radiotherapy related information needs and concerns; determine unmet information needs; ascertain which information sources patients prefer to receive; and explore whether information provision reduces anxiety and depression. Halkett et al. (2012) found women were most concerned about the impact treatment would have on their health in the future. Women identified high information needs prior to treatment planning and commencing treatment. Women's anxiety at baseline (mean = 6.07, SD = 3.89) did not significantly drop until after treatment commencement (mean =5.33, SD = 4.15). This study demonstrates that women's information needs, and anxiety are high until treatment commencement. Halkett et al. (2012) recommend that a greater focus is placed on providing information to patients prior to treatment planning and prior to treatment.

In a cross-sectional population-based survey conducted, Husson et al. (2013) measured the perceived level of, and satisfaction with, information received by patients with metastasized colorectal cancer as compared with those with nonmetastatic (stage I, II, III) colorectal cancer. Additionally, associations of information provision with health status, anxiety, depression, and illness perceptions were investigated. Husson et al. (2013) surveyed 1159 patients, of which 139 had metastatic colorectal cancer. Participants completed questionnaires on information provision, health status, anxiety and depression, and illness perceptions. Husson et al. (2013) found the perceived receipt of information was quite comparable between colorectal cancer patients with

and without metastatic colorectal cancer. Only perceived receipt of treatment information was higher for patients with metastatic colorectal cancer (45 versus 37; $p< 0.01$). The findings of this study indicate that some improvements can be made in the provision of information to patients with metastatic colorectal cancer. Adequate assessment of information needs of metastatic colorectal cancer patients, as well as appropriate responses to these needs by providing the information in an appropriate way could possibly lead to improvements in patient satisfaction (Husson et al., 2013). This study solidifies the need to focus on chemotherapy naïve patients versus patients that have metastatic disease, as patients with metastatic disease have different informational needs.

In this single-arm prospective study grounded in the SPAWN model, Jabaley et al. (2020) describes a project that shaped a model for chemotherapy education and support in ambulatory care. The purpose of the study was to develop and evaluate a nurse-led psychoeducational intervention using a multimedia tool to prepare patients with pancreatic and colorectal cancer for chemotherapy treatment in an ambulatory care setting. Specific aims were to calculate the feasibility of conducting the intervention within nursing workflows, describe changes in participants' pre- and postintervention knowledge about chemotherapy side effects, and explore participants' self-reported acceptability and usability of the intervention (Jabaley et al., 2020). Oncology nurse navigators in the outpatient gastrointestinal (GI) malignancies clinic of the Dan-Farber Cancer Institute in Boston, Massachusetts, conceptualized the project using the Science and Practice Aligned Within Nursing (SPAWN) model for implementation of evidence-based practice (EBP).

Principles of adult learning theory, use of the teach-back method, and a patient learning needs assessment were essential to the design of teaching sessions (Jabaley et al., 2020). Using

the SPAWN process, GI oncology nurse navigators initiated the development of an interprofessional team to improve patient education (Jabaley et al., 2020). To coordinate and standardize education, the team observed the greatest distress in patients and families from diagnosis to the start of chemotherapy. This study is instructive in describing a model that may be applied in other institutions and with other populations of patients with cancer.

Jivraj et al. (2018) describe the development of nurse-led chemotherapy education class tailored to patients with gynecologic cancers and focused on common chemotherapy treatment protocols. The purpose of the class was to help patients and caregivers know what to expect during their chemotherapy routine, lower anxiety, and to equip them with knowledge and skills to manage side effects of treatment. Five hundred thirty-eight patients and 506 caregivers attended the class. Although metrics were not kept, nurses observed significant decreases in the number of calls related to the management of chemotherapy medications, side effects, and appointments since the initiation of the class. Jivraj et al. (2018) believe this illustrates that having dedicated time to educate patients and caregivers about treatment, as a separate clinic visit, has improved outpatient clinic time management and increased personalized care for these patients. The study provides a platform for the development of other, disease specific patient education programs that can be offered in a variety of ways.

Keener & Winokur (2018) determined the effectiveness of standardized, digitally recorded education as an alternative teaching method for increasing knowledge recall and decreasing anxiety in patients receiving first-time chemotherapy and found that digitally recorded education methods produced significant decreases in anxiety and increases knowledge recall.

Mann (2011) looked at an individualized information program in a controlled environment prior to chemotherapy. Research has repeatedly shown that, after careful assessment of individual needs, effective patient education delivered during the initial phase of diagnosis and treatment can improve symptoms of anxiety and fear, improve self-care decisions, decrease side effects of treatment, and enhance quality of life. An individual program does not necessarily equate to the solution; however, assessing individual patient needs with a program delivered during the initial phase of diagnosis can improve symptoms of anxiety and fear with improvement in self-care decisions to enhance quality of life.

Marcus' (2014) objective was to study verbal instruction and develop strategies for improving the quality of verbal patient and family education and make recommendations for best practices. Marcus (2014) identified verbal education models, best practices, and needs. Through a review of the literature and the creation of the EDUCATE model of verbal education, Marcus (2014) concluded that verbal education of patents and family members requires a multidisciplinary approach that considers learning styles, literacy, and culture to apply clear communication and methods for the assessment of learning. Providers need the skills, time, and training to effectively perform patient and family verbal education every time they care for patients (Marcus, 2014).

In this prospective single center audit, Oswald et al. (2018) administered a questionnaire prospectively to 292 patients preoperatively and up to six months postoperatively to evaluate patient satisfaction with perioperative information in those undergoing surgery for lung cancer and change in satisfaction over time. Oswald et al. (2018) found patients were highly satisfied with information prior to surgery. The overall helpfulness of information did not change over time, but satisfaction with the amount of information decreased. Free text responses revealed

patients most frequently wanted more information on the disease, after care and self-care. Patients wanted to know more about their diagnosis, but also how to recover and cope with issues once they have gone home after surgery. Postoperative satisfaction with information may improve if patients are given more information on these topics (Oswald et al., 2018). This information seems generalizable to other populations with a diagnosis of cancer.

Parker et al. (2018) addressed health literacy principles in this review to summarize the existing research on how health literacy principles are incorporated into breast cancer education materials. Research suggests that chemotherapy education materials can be critical to addressing problems of non-adherence and may include written, verbal instruction, and multimedia programs. Despite this wide variety, the effectiveness and benefit of chemotherapy education hinges on patients' health literacy. Breast cancer patients with low health literacy may be unclear about chemotherapy or face difficulty adhering to treatment if they do not understand the information provided to them. Findings indicated that limited research exists regarding the use of health literacy principles in chemotherapy education materials. Much of the development of chemotherapy education is not grounded in theory and the application of health literacy principles is limited. Implementing health literacy principles may improve overall comprehension of education thereby increasing adherence.

In this pilot study on patient education, Portz and Johnston (2014) describe a quality project that evolved from a review of patient education process for patients with cancer in three medical oncology clinics to a pilot of a new model for patient education. The pilot identified gaps, developed, and implemented evidence-based improvement strategies, and planned for evaluation of process and patient outcomes of this practice change. A pilot study to assess processes and workflows associated with a one-hour separate patient education visit was

designed and initiated (Portz and Johnston, 2014). The standardization of patient education in this pilot study provides a foundation from which new models for oncology nurse-led patient education are to be developed.

In this randomized controlled trial, Ruiz et al. (2014) investigated whether computer-based programmed instruction (CPI) with a dynamic avatar (DA) improves retention of medication information better than text (controls). One-hundred fifty participants with type 2 diabetes mellitus were randomized comparing text delivered sequentially (TDS) versus computer-based programmed instruction (CPI) in 4 conditions: [CPI with voice (T-CPI), CPI with voice (V-CPI), static avatar (SA-CPI), and dynamic avatar (DA-CPI)]. CPI sequentially delivers segmented information in text or voice followed by a multiple-choice question. Immediately after the user selects an option, CPI delivers elaborate feedback. Satisfaction was measured immediately after the interventions, and medication knowledge was measured at 2 weeks. Ruiz et al. (2014) found that computer-based programmed instruction enhanced by a dynamic avatar (DA-CPI) did not improve medication knowledge retention at 2 weeks. Computer-based programmed instruction led to higher patient satisfaction compared with controls.

Shaverdian et al. (2020) assessed the patient experience with telemedicine to determine satisfaction, quality of care being delivered, and opportunities for optimization. Patients seen within a multistate comprehensive cancer center for pre-pandemic office visits and intra-pandemic telemedicine visits in December 2019 through June 2020 who completed patient experience questionnaires were evaluated. Patient satisfaction between office and telemedicine consultations were compared, patient visit-types preferences were assessed, and factors associated with an office visit preference were determined.

In total, 1,077 patients were assessed. The telemedicine survey response rate was 40%. No significant differences were seen in satisfaction scores between office and telemedicine consultations, including the appointment experience versus expectations. This study found high patient satisfaction and confidence in their care. Optimization of telemedicine in oncology should be a priority, specifically, access to audio capabilities that can improve patient-oncologist communication. The study results indicate that optimizing telemedicine in oncology chemotherapy education supports utilizing the telemedicine platform to improve patient care and provider efficiency. Shaverdian et al. (2020) found little difference with telemedicine satisfaction when compared to in-person visits. Therefore, by utilizing the existing telemedicine platform, this method of education delivery is an ideal method to improve quality measures, promote equity, and provide affordable capability while optimizing the existing telemedicine system.

In this prospective study, Scott et al. (2019) evaluated a teach-back education intervention for nurses to improve patient comprehension of discharge instructions at a 20-bed inpatient adult hematology-oncology unit in a comprehensive cancer center. The education intervention included components of didactic training, simulation, and competency assessment. For the one-month and three-month follow-up surveys, the researcher sent the informed consent and the Conviction and Confidence Scale in a Survey Monkey questionnaire to each participant via email.

Patient perceptions of care were measured using two questions on the institution's Press Ganey® inpatient survey. The Cronbach alpha for the entire questionnaire was 0.97, which indicates that the tool has a high internal consistency and reliability (Press Ganey Associates, 2010). Data were collected and analyzed three months pre-implementation and three months post-implementation. For the two discharge questions presented to patients, the Cronbach alpha

was 0.82 for “extent you felt ready to be discharged” and 0.72 for “instructions given about how to care for yourself at home.” Utilizing 1-month and 3-month surveys assists in learning patient perceptions for this program.

Scott et al. (2019) found the average of initial rankings from participants on the importance of the teach-back method at pre-implementation was 8.94 on a scale ranging from 1 (not at all important) to 10 (very-important). The average rose to a high of 9.82 (T3). Using analysis of variance, the results immediately following the teach-back education (T1) indicated significant improvement in how convinced nurses were on the importance of the teach-back method ($p < 0.001$, $F = 9.64$). The results of this study indicated that nurses were more confident in their ability to use the teach-back method and integrated many teach-back competencies into clinical practice.

In this systematic review of reviews, Sustersic et al. (2017) performed a review of reviews and proposed general recommendations and suggestions for improving the quality of Patient Information Leaflets, how to use them and methods for evaluating them. Sustersic et al. (2017) searched five databases for reviews, systematic reviews and meta-analyzes describing Patient Information Leaflets. Of 986 articles found, 24 reviews were pertinent; the five oldest considered the impact of Patient Information Leaflets irrespective of the condition the patient consulted for; the 19 more recent ones mostly addressed precise clinical situations. Sustersic et al. (2017) found Patient Information Leaflets improve patients’ knowledge and satisfaction. For acute conditions, in short-term Patient Information Leaflets also improve adherence to treatment. For chronic diseases, invasive procedures or screening situations, their impact on adherence varies depending on the context, how the Patient Information Leaflets are given and the invasiveness of the intervention. Sustersic et al. (2017) proposes checklists for writing,

designing, using, and evaluating Patient Information Leaflets in randomized clinical trials to enable comparisons of different studies.

In a quantitative research design used to retrospectively survey two groups of 350 participants via a postal questionnaire, Sutherland and McLaughlan (2013) explored whether the timing of patient education influences patient satisfaction with the education experience and to test the following hypothesis: Patients who receive a patient education session on the same day as their computed tomography (CT) simulation appointment will be significantly more satisfied than patients who receive a patient education session on their first day of radiation therapy treatment. No significant difference in the levels of satisfaction was found between the two groups. Sutherland and McLaughlan (2013) concluded patient preference for the timing of education sessions should be accommodated whenever possible, however, it also is reasonable to consider the operation requirements of the department when scheduling education sessions.

A recent systematic review by Talevski et al. (2020) demonstrated the use of teach-back has been shown to improve patients' knowledge and self-care abilities. This review aimed to synthesize evidence about the translation of teach-back into practice, including mode of delivery, use of implementation strategies and effectiveness. Teach-back was found to be effective across a wide range of settings, populations, and outcome measures. While its mode of delivery is well-defined, strategies to support its translation into practice are not often described. Use of implementation strategies, such as training and education of stakeholders and supporting clinicians during implementation, may improve the uptake and sustainability of teach-back and achieve positive outcomes.

In this continuing nursing education article, Tamura-Lis (2013) provides a clear and concise explanation of evidence-based teach-back method. Tamura-Lis (2013) defines teach-

back method, its benefits and how it can be used to promote patient health literacy, facilitate patient comprehension, and explains the key elements for utilizing teach-back appropriately. Use of an evidenced-based method such as teach-back to communicate medical information enables clinicians to subsequently evaluate whether learning has occurred (Tamura-Lis, 2013).

In this randomized clinical trial, Tarn et al. (2013) conducted a controlled clinical trial of 256 patients in three primary care practices, combining data from patient surveys with audio-recorded physician-patient interactions. Twenty-seven physicians participated, with approximately half of the physicians in each of the three participating offices were randomly assigned to the intervention group. The intervention consisted of a one-hour physician-targeted interactive educational session encouraging communication about newly prescribed medications that emphasized the importance of conveying five basic elements of information about new medications (medication name, purpose, directions for use, and side effects). The mean Medication Communication Index (MCI) for medications prescribed by physicians in the intervention group was 3.95 (SD = 1.02), significantly higher than that for medications prescribed by control group physicians (2.86, SD 1.23, $P < .001$). The effect held regardless of medication type (chronic vs nonchronic medication). Tarn et al. (2013) concluded that a physician-targeted educational session improved the content of and enhanced patient ratings of physician communication about new medication prescriptions.

Thompson et al. (2013) conducted a pilot study with 14 patients with cancer that participated in a study to measure changes in knowledge, perceived benefit of nutrition, and perceived self-efficacy in handling side effects of chemotherapy before and after viewing a 15-minute DVD. Participants completed a survey with demographic, knowledge items, and perceived health belief and self-efficacy statements; viewed a DVD; and were then sent home

with a one-page handout. No significant differences were noted in statements intended to evaluate changes in perceived health beliefs. However, perceived knowledge and skills related to managing side effects increased ($p < 0.05$). The participants in this pilot not only showed an increase in knowledge but demonstrated application of knowledge by reporting tips they used.

Valenti (2014) conducted a literature review to determine the best method to provide chemotherapy education to patients. Sixteen articles that employed various teaching methods (e.g., video recordings, in-person class) were identified. Valenti (2014) found various methods can be used to provide chemotherapy education, and no method has been proven to be significantly more effective than another. Many ways can be used to provide chemotherapy education, and no method has been proven to be significantly more effective than another. Maximum retention is largely based on patient preference.

In this systematic review, Waller et al. (2015) determined the volume and scope of research output examining preparation of patients for people undergoing cancer-related surgical treatment, and the impact of pre-operative education on patient outcomes and health care utilization. Waller et al. (2017) identified 121 eligible papers. Most were data-based ($n = 99$) and descriptive ($n = 83$). Face-to-face interventions reported benefits for anxiety (5/7), satisfaction (1/1), knowledge (3/3) and health care costs (1/1). Audio-visual and multimedia interventions improved satisfaction (1/1) and knowledge (2/3), but not anxiety (0/3). Written interventions were mixed. Waller et al. (2017) conclude that pre-operative education can improve satisfaction, knowledge and reduce anxiety.

In this often-cited randomized clinical trial, Williams and Schreier (2004) sampled 70 women receiving their first treatment of chemotherapy to determine the effectiveness of informational audiotapes on self-care behaviors, state anxiety, and use of self-care behaviors to

describe the occurrence and intensity of common side effects in patients with breast cancer. Subjects completed the Spielberger State-Trait Anxiety Instrument (STAI). The experimental group received two audio tapes. At one and three months, subjects completed the modified Nail Self-care diary and STAI via telephone. Self-care diary (SCD) is a self-report of occurrence and intensity of side effects and the use and effectiveness of self-care behaviors. The instrument measures the number of side effects experienced, severity of each of the side effects experienced, number of self-care behaviors performed for a given side effect, and the effectiveness of the self-care behaviors. Content validity of the original instrument was established by Nail et al. (1991) in a study of two patients and three oncology nurse specialists. Foltz et al. (1996) reported a test-retest reliability of 0.80. State-Trait Anxiety Instrument (STAI): STAI (Spielberger, 1983) has been used extensively in assessing anxiety in medical surgical, psychosomatic, and psychiatric patients. Test-retest and alpha coefficients demonstrate that STAI is a reliable instrument with internal consistency and stability. Assessments of concurrent, convergent, divergent, and construct validity indicate that STAI is a valid instrument (Spielberger, 1983). The STAI instrument may be considered to measure anxiety if further research occurs beyond a pilot.

In this randomized clinical trial with three-cohort prospective comparisons design, Wu et al. (2014) evaluated the effectiveness of an accessibility-enhanced multimedia informational education program in reducing anxiety and increasing satisfaction with the information and materials received by patients undergoing cardiac catheterization. In total, 123 consecutive patients were randomly assigned to one of three groups: regular education (group 1), accessibility-enhanced multimedia informational education (group 2) and instructional digital videodisc education (group 3). Anxiety was measured with Spielbergers's State Anxiety

Inventory, which was administered at four-time intervals: before education (T0), immediately after education (T1), before catheterization (T2) and one day after cardiac catheterization.

Wu et al. (2014) found all patients experienced moderate anxiety at T0 to low anxiety at T3. Accessibility-enhanced multimedia informational education patients had significantly lower anxiety and felt the most satisfied with the information and materials received compared with patients in groups 1 and 3. A statistically significant difference in anxiety levels was only found at T2 among the three groups ($p = 0.004$). Wu et al. (2014) concluded patients who were scheduled for cardiac catheterization had moderate anxiety and required information to cope with stress. Patients in the accessibility-enhanced multimedia informational education group experienced significantly lower anxiety levels and felt the most satisfied with information and materials received compared with patients in the regular education group and instruction; thus, it can be adapted to supports complement patient education in future care.

Literature supports the idea that integrating telemedicine into practice as a continued option for care delivery can improve the overall quality of telemedicine education programs. Patient comfort and clinicians alike can benefit from this approach to health care delivery.

Theoretical Framework

Peplau's (1997) Theory of Interpersonal Relations was the theoretical framework for this QI project. Theorist Hildegard E. Peplau developed the middle range descriptive of classification theory of interpersonal relations. The theory explains the purpose of nursing is to help others identify their felt difficulties. The four components of the theory are: person, who is a developing organism that tries to reduce anxiety caused by needs; environment, which consists of existing forces outside of the person, and put in the context of culture; health, which is a word symbol that implies forward movement of personality and nursing processes toward creative, constructive, productive, personal, and community living (Peplau, 1992). This theory is an important combination of caring and compassionate communication through the relationship nurses create with interaction with patients.

Peplau's nursing model identifies four sequential phases in the interpersonal relationship include: Orientation, Identification, Exploitation, and Resolution (Peplau, 1992). Froczek (2019) explored how nursing can embrace and extend nursing theory to virtual care situations. Peplau's interpersonal relationships in nursing could easily be studied in virtual care context as well, especially for mental health interventions (Fronczek, 2019) and for delivery of education. Nursing can incorporate Peplau's theory as nurses apply the constructs of Peplau's theory in the process of orientation to the virtual care relationship, how problems are identified, and how persons and interventions can be exploited and resolved (Froczek, 2019). Opportunities for new ways of communicating health information and trends now exist. The role of the nurse is to advocate that individuals are getting the right care, at the right time, and in the right modality safely (Fronczek, 2019). Carroll (2018) stated "telehealth nursing should be considered an opportunity to operationalize and transform the art of care, especially when it is guided by

nursing theory." Peplau noted that as patients enter the healthcare arena, they are often in a vulnerable state, lacking health literacy, fearing the unknown and fearing pain. Patients are quite dependent upon the empathy, communication, and skills that nurses offer (Peplau, 1997).

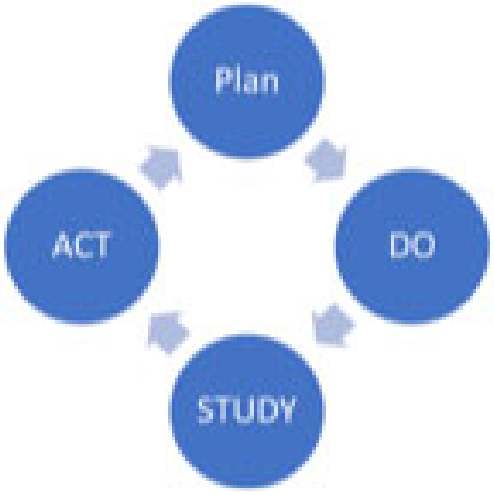
Project Methodology

Approval Process: This project is a culmination of four years of research. The approval process began in the Spring of 2021 after identifying standardized chemotherapy education delivered over the telemedicine platform as a topic of interest. Meetings took place with key stakeholders within the institute where the pilot project was to be launched. After filing a project proposal application to the Scholarly Project Review Committee, a Review Research Committee responded with feedback and next steps. Approval was received following meetings with the Advance Practice Provider Professional Development Director, Advance Practice Provider Manager, the office of Nursing Research, and Nurse Leader of the project location. This project did not qualify as human subject research; therefore, it did not require Institutional Review Board (IRB) oversight or approval. All information related to the project was collected in a manner which protected patient confidentiality by removing any patient identifiers (Name, DOB, and chart ID number). The telemedicine platform utilized for providing telemedicine services was confirmed to be HIPPA compliant.

Methodological Method: An, individual, enhanced multimedia one-hour chemotherapy education class available in multi-modalities, including verbal, written and multimedia was implemented via an existing telemedicine platform at a regional site for patients undergoing initial chemotherapy. This QI pilot project target-population was directed towards English-speaking patients, ages 18 and older with a new diagnosis of breast cancer undergoing initial chemotherapy. The methodological method utilized within this project is the Plan Do Study Act (PDSA) model. The PDSA model can provide a solid foundation from which to start the process of a quality improvement program: plan what will be done, do it, study and analyze the results, and act on the results to make improvements in what you are doing (Morelli, 2016).

Figure 1

Plan Do Study Act Cycle



Note. Plan, Do, Study, Act Model summarizes the four steps that influence a quality improvement project. Own work.

The plan included developing the standardized curriculum. It was important to iteratively test, refine, and eventually implement the same curriculum. This method allows for constant improvement based on implementing cycles of performance improvement (Institute for Healthcare Improvement [IHI], 2021). The question was whether telemedicine could be utilized to accomplish the chemotherapy education and would it enhance preparation for the patient's first chemotherapy with a separate educational appointment and increase patient and staff satisfaction. Data were collected via patient and staff surveys, review of medical records, and interviews.

The project author drafted an introductory letter stating the purpose of the pilot to potential candidates. The project author created a Pre-Test and Post-Test and Patient Satisfaction Survey to gather data that included patient attitudes regarding telemedicine. The Pre-Test and Post-Test were given to each patient with a Patient Satisfaction Survey, including a 5-point Likert scale utilized to measure responses about the course and telemedicine experience. A Nurse Satisfaction Survey was created, and staff surveyed. The survey used a five-point Likert scale to gather data on nurses' perceived satisfaction with telehealth and its efficacy to assess and treat patients with a Score 1 (Strongly Disagree); 2 (Disagree); 3 (Undecided); 4 (Agree); and 5 (Strongly Agree).

A Pre-Test and Post-Test with 20 questions was issued to each participant. Each question contained four choices as answers. These data were analyzed to study ease of access to the telemedicine dashboard, usefulness of the information in the class, delivery method, font size of information, instructions on the entire process during information given, if nurses listened patiently, if nurses answered questions appropriately, the friendliness of the nurse, concern shown by nurse, the ease of scheduling the class, if the class was taught in plain language and at a level that was easy to understand, and with adequate time allotted for questions. Globally, it looked at whether the class prepared the patient for their first chemotherapy, and if the class prepared the patient to better manage potential chemotherapy side effects. Long-term analysis determined if patients understood when it was important to contact the health provider. Each question was analyzed to determine how patients scored on the Pre-Test and then after the class on the Post-Test. The analysis examined the number of correct answers, as well as an analysis of incorrect answers. Additional data analysis looked at telemedicine experience expectation; likelihood to recommend the practice of telemedicine; and overall satisfaction with the

information and materials received. The data were evaluated to study how satisfied patients were with the program.

Risk Analysis

A SWOT analysis was conducted to identify strengths, weaknesses, opportunities, and threats to a comprehensive standardized chemotherapy education program delivered over a telemedicine platform. Conducting a needs assessment using a SWOT framework analysis identified that there was marked variation in the current education process. During the COVID-19 pandemic, various smartphone applications and telemedicine applications were being utilized, e.g., Doximity®, Cisco Jabber®, and FaceTime®, revealing dissatisfaction among patients and staff. SWOT analysis can reveal opportunities for educational improvement and target areas with perceived and real threats to patient anxiety that can lead to poor psychosocial outcomes, dissatisfaction with care, and decreased adherence to treatment (Garcia, 2014. By incorporating evidence-based practices of health education specialists, collaborating with nurse educators and registered nurses, and using cutting edge technology development, this pilot program provides a technology-driven solution for delivery of first-time chemotherapy patient education for cancer patients and their caregivers.

Strengths

Strengths identified to build upon include the education department, an entire team dedicated to helping people take an active role in managing their care of a loved one. Health education specialists collaborate with the organization's expert healthcare providers to provide people with cancer, their caregivers, and the public with accurate and reliable information to empower them to participate in their cancer care. Through the organization virtual library, one can access written information, videos, and webcasts. Available organization patient education resources include 11,000 resources, including many printed in multiple languages, and more than 60 videos.

A strong nurse-educator program comprised of staff-development specialists teaches and defines roles designing curricula, developing classes and programs of study, and provides continuing education programs for the entire organization. Additional evidence-based mentors and clinical nurse specialists are widely available for consultation.

A strong existing telemedicine technology program has been in place since 2017. Adding functionality to an existing system was an excellent means of optimizing product utilization. The investment in the telemedicine platform includes custom-designed features such as integrated connectivity with existing electronic medical record with multiple, hardware-based video conferencing capabilities with patient consultation hosting. It also includes a Picture Archiving and Communication System (PACS). This system is part of an initiative to develop and execute telemedicine with a virtual care strategy for the institute's patients and providers through change management and investments in digital transformation. This QI pilot provides a better understanding of user expectations, usage situations, product behavior, and performance.

Weaknesses

Weaknesses were identified in the current chemotherapy education plan after reviewing patient education documentation. Chart review identified documentation was inconsistent across the organization. During review of outpatient nursing documentation in the electronic medical record, it was identified that several nursing notes varied in capturing re-education with patients. The current chemotherapy treatment assessment note and event notes do not capture education or reinforcement. Initial documentation is documented in a patient education document file (PEDF), while subsequent education is often written as free text and usage of PEDF is variable among nurses. Outpatient nursing notes such as telephone, electronic communication note, and post chemotherapy/biotherapy note vary in documentation of education. An internal assessment was conducted and identified inconsistencies in pre-chemotherapy teaching and education within the breast medical oncology department. Some registered nurses utilized a calendar, while others did not. All registered nurses provided written material to patients. There was no patient education standard of care (SOC) for education documentation until recently developed and submitted by an ad hoc group that this author participated in for review and commentary. The Press-Ganey® score was revealed as below 93% on education about disease and symptom management. Although this is still high, at the organization, there is a benchmark for excellence and a strong desire to improve these scores. An information gap related to available patient education resources was prevalent across the organization with many nurses unaware of the vast amount of patient education resources available for patients and caregivers. Barriers to a standardized education program within the organization include provider variability in patient education documentation and that individual education needs are unique to each patient.

Opportunities

Opportunities for this project are external factors that improve patient and caregiver education; educating the oncology nurses on evidence-based guidelines; and utilizing state of the art information technology to deliver evidence-based interventions to educate patients about management of illness while improving the management of chemotherapy-related symptoms. Overall, this project improves the organization brand, which is synonymous with a brand of excellence regarding cancer care known to the public. This project provides an opportunity to improve Press-Ganey® patient satisfaction scores.

Threats

Threats to this project are external factors that include providing effective and essential cancer care during a pandemic (Jazieh et al., 2020, Wise, 2020. The following themes emerged from the American Society of Clinical Oncology (ASCO) regarding the COVID-19 pandemic: risk minimization, patient care prioritization, health care team management, research management, providing effective virtual care and recovery phase preparations. Anxiety, another threat is well-studied, and a known factor associated with cancer diagnosis, chronic illness, and its effects on learning (Garcia, et al, 2014, Halket, et al, 2011, Husson, et al, 2012, Lam et al., 2013, Marcus, et al., Susteric et al., 2017, & Wu et al., 2014). Social distancing and the impact upon essential cancer care poses a threat (Schrag et al., Virnig & Nikpay, 2020). Identification of low health literacy (Barbour, 2020); patients not equipped with smartphone technology; patients with limited information technology knowledge; patients without internet access; and patients with cognitive deficits all pose as threats to learning in this type of program. An additional external threat is that of competing health care organizations. Throughout the region, there are multiple competing cancer care centers. Cancer care is a highly competitive market.

There was a perceived lack of funding for educational programs given recent institutional funding loss during the COVID-19 pandemic. Threats include lack of financing and associated lack of necessary technology tools needed, such as initially proposed hand-held tablets that may be utilized to implement an educational program of this magnitude for patients and staff alike. Given the implementation of the telemedicine dashboard platform, an alternative resource was available other than the utilization of a tablet. Optimization of the existing telemedicine platform was a key financial driver to the success of this quality improvement proposal. Additionally, if there were an external hiring freeze within the organization, this would affect staffing for this program. This could have significantly affected the intended implementation of this program.

Contingency Planning

A plan was developed to manage external threats associated with providing essential care during the pandemic. Previous data provided evidence that interactive audiovisual communication technologies enhance the quality of telemedicine encounters (Shaverdian et al., 2021). Telephone-only patient encounters were two times more likely than those who had an audiovisual encounter to report that their understanding of the treatment plan would be better with an in-person visit (Shaverdian et al, 2021). Disappointment with the quality of telemedicine visits with the telemedicine dashboard could potentially impact the program's success; therefore, an alternative method using Doximity® could target this threat prior to utilizing a Telephone-Only visit. It is well-known that the importance of the audiovisual encounter is supported by multiple studies that have found that nonverbal interactions between clinicians and patients strengthen the therapeutic alliance and lead to higher patient satisfaction and quality of care (Mast, 2007; DiMatteo et al., 1980).

Another threat identified was anxiety, a well-known threat that is a known factor associated with cancer diagnosis, chronic illness, and its effects on learning (Garcia, et al, 2014, Halket, et al,2011, Husson, et al, 2012, Lam et al., 2013, Marcus, et al., Susteric et al., 2017, & Wu et al., 2014). This remains critical in oncology, where there is a high prevalence of psychological distress and nonverbal interactions have been found to be instrumental in eliciting and appreciating patient distress (Mast, 2007; Holland, et al., 2013). Because telemedicine had not been utilized widely, an extensive written training program on how to access and utilize the system was implemented and made available to the patients prior to usage of the telemedicine platform dashboard. This included a personal appointment selection determined between the patient and the registered nurse that was patient-centric and confirmed by an office coordinator that called the patient to confirm the educational appointment.

Another threat was low health literacy. While identification of low health literacy (Barbour, 2020) technology issues associated with patients not equipped with computer pose as threats to learning in this type of program, an alternative to consider was smartphone technology that could be offered with Doximity®. While lack of access to technology may continue to pose a threat to learning, an additional alternative would be a Telephone-Only call with a final solution of In-Person education.

Competing agencies could prove a threat in the form of providing better care offered elsewhere. Advertising and branding are important tools implemented for patients to familiarize patients and caregivers with the telemedicine program that are synonymous with the hospital brand. These included an internet focus on the benefits of a telemedicine visit: acknowledging the benefit of not needing to travel to another appointment that can take a lot of time and energy, and allowing patients and family to remain in the comfort of their own home while they see a

clinician. An emphasis on saving travel time and money; helping patients spend less time at a provider's office; and not having to take time off from your responsibilities to travel to appointments were all noted as benefits. Extensive instructions on how to use the telemedicine platform by selecting "Getting Ready for Your Telemedicine Visit" were offered to all patients. Information was provided telling patients that their video would not be recorded or saved, and that all information will stay private and secure. All telemedicine appointments meet the strict standard of the Health Insurance Portability and Accountability Act (HIPAA). All these valuable measures were put into place to ensure confidence in the brand.

Implementation Timeline

Phases of Implementation. The pilot project consisted of several phases, beginning with a needs assessment. The implementation of a nurse-led standardized education curriculum pilot across a telemedicine platform was identified as an essential project. While telemedicine was previously established as a safe and accessible means to provide care during the COVID-19 pandemic, the standardized curriculum became a topic to address and how it influences patient satisfaction. After deciding on a project framework, a budget, and a marketing plan with a SWOT analysis that was shared with key stakeholders, an approval to conduct a QI pilot project occurred Spring 2022.

A theory logic model paints a picture of how a new project, once implemented, would work. An effective logic model makes an explicit, visual statement on the activities that will bring about change and the results that are expected post implementation. See (Appendix A) for Theory Logic Model. After the completion of a timeline for the project implementation, the assumptions were examined. The assumptions focused on whether patients and the organization needed a structured, standardized patient education class. To obtain this, input was generated

from various stakeholders, including the director of Advanced Practice Provider (APP) Professional Development, who has expert knowledge in reviewing Quality Improvement projects. The Patient and Family Caregiver Engagement Department director was engaged in multiple in-depth meetings. Office practice nurses were surveyed. Activities elaborated in the theory logic model are required for the successful implementation of this project, including review of the evidence, curriculum development, staff training, and networking with key stakeholders. The outcomes of a standardized patient education program are increased patient quality outcomes with preparedness for chemotherapy, increased patient satisfaction, decreased need for intervention with side effects, reduced variability with teaching methods, improved systems efficiency, improved effectiveness, and improved quality of care, which may relate to fewer emergency room visits among adult cancer patients receiving chemotherapy. Successful implementation of the project will occur when there is digital transformation in organizational change regarding delivery of a standardized education for patients undergoing chemotherapy.

Spring 2022

Implementation of the telemedicine program began in Spring 2022. Curriculum was finalized after surveying the breast medical oncology office practice nurses at the regional site of proposed project implementation. The standardized curriculum was evaluated, and a determination made to implement specific standardized features across the service. The program blueprint included a disease-specific educational program that was based upon a patient learning needs assessment, identified as essential to the design of the teaching sessions. With evidence-based theory, incorporating Peplau's Nursing Theory of Interpersonal Relations, Knowle's Adult Learning Theory, and Teach-Back Methodology, a standardized program was developed and implemented. The educational process highlighted expected outcomes that positively affected

patients and their caregivers. Office practice nurses agreed upon the value of training and training commenced. The program implementor launched a staff training program between May and June 2022. The staff received training on telemedicine technology, equipment, etiquette, and teaching on the telemedicine platform. The office practice nurses utilized the existing telemedicine dashboard platform and headsets provided by the institute with all the same IT support services for conducting virtual visits afforded them.

Summer 2022

Patient recruitment began June 2022. The project implementor developed an introductory letter to target prospective candidates to the pilot. This was distributed to potential candidates on the initial day of the patient's medical oncology visit. The physician, office practice nurses, and project implementor screened potential patients by chart reviews prior to the initial visit and further screening was conducted during the initial visit to target potential candidates.

The project implementor presented the project to potential candidates, providing the screening letter explaining the project. It was explained that chemotherapy education course content that would be taught by the breast medical oncology office practice nurse over the telemedicine platform. Candidates were informed of the reporting requirements, including the 20-question Pre-Test, the 20-question Post-Test, and the Satisfaction Survey. Once verbal consent was obtained, the standardized educational curriculum was provided to the candidate. No incentives were offered for survey completion.

Fall 2022

Ongoing weekly recruitment continued throughout the Fall with a relatively low number of participants being recruited given a new institute-wide policy process to increase recruitment of metastatic breast cancer patients to research protocols over newly diagnosed patients with breast cancer. This slowed the recruitment process, given the inclusion criteria included all those patients that were chemotherapy naïve. In December 2022, final recruitment occurred.

Budget

The budget proposal was necessary to provide a formal quantitative expression of a management plan for a pilot study of a standardized patient education program utilizing a telemedicine platform. Departmental expenses must be known and planned for by an organization to ensure sustainability with the limited resources available. The largest expenses in acute care organization are salaries and benefits for its employee on the units. The second expense is the purchase of equipment and supplies that are utilized.

The entire project implementation was on a voluntary basis by the implementor; thus, it did not incur any additional expenses to the institution. With readily available teleconferencing software developed at the institution with an integrated telemedicine platform, telemedicine was accessible and widespread in the institution. The telemedicine platform is a custom-designed platform that supports interaction of multiple users and is capable of audioconferencing. This platform allows the medical facility that has a PC-based picture archiving and communication system (PACS), PC-based treatment-planning software, and a PC-based electronic medical record system to utilize the system. The existing system has broad capabilities and application, with patient education being just one entity. The author/implementor of the project spent most labor hours on education on different days and hours to accommodate the three staff members

conducting the patient education classes. The author initially educated three registered nurses on the breast medicine service at one specific regional site to implement the pilot program. Additional hours were spent on the compilation of the statistical analysis of the collected data.

Though this project was based upon a voluntary basis, any future implementation of the project lists potential expenses outlined on Table 1 below. The budgeting is critical to ensure that adequate resources are set aside for any project implementation.

Proposed budget.

Table 1

Resources	**Estimated expense**	**Actual expense**
Principal investigator; Estimated 500 hours at $100/hr.	$50,000	$0 *
Cost of Registered Nurse to teach $75/hr x 30 hours	$2,250	$0
Data Analyst: Estimated 8 hours at $60/hr	$480	$0
Educational material: Handouts (used projector instead).	$500	$0
Printouts for: sign in sheets, observer documentation and survey sheets.	$100	$0
Internet (Wi-Fi) Cost (Used hospital Wi-Fi)	$500	$0
Laptop	$1,500	$0
Telehealth Platform	$1,000,000	
Logitech® Brio Ultra HD Webcam for Video Conferencing, and Streaming	$175.10	$0
Logitech® USB Headset Stereo H570e	$100	$0
Principal investigator; Cost for travel = 40 miles one way, 2 times a day, 12 weeks @ Federal Standard Rate $0.56/miles	$537.60	$0
Implementation observer costs: 30 hours at $75/hr,	$2,250	$0
Total	$1,058,392.70	$0

- Principle investigator provided labor on a voluntary basis.

Marketing

According to Borden (1984), the strategic market mix, built upon the concept of Landrum's four P's are the key considerations that must be thoughtfully reviewed and wisely implemented in order to successfully market a product or service. According to Chism (2019), Landrum initially introduced this theory in the 1950's with the four P's for marketing projects: product, price, place, and promotion. More P's have since been identified including people, process, and physical evidence and are relevant to current trends in marketing (Ngai, & Wu, 2022). New regulations and reimbursement practices have gained new traction and telehealth adoption rates have skyrocketed among patients and providers alike. Providers, payors, technology developers and patient advocates have an opportunity to launch, develop and implement telehealth solutions. The value of the pilot states how the product solves the customer's problem, and the benefits of the product.

First and foremost, identifying key stakeholders of a targeted audience with the most effective channels to engage with them in a review of the proposal, the curriculum, provide funding, assist with implementation, execute teaching, and simply be involved in the project as research subjects/participants were most essential. For this project, the key stakeholders to which the proposal was marketed included the Patient and Caregiver Engagement Department at the organization. This department oversees the educational content of the program. Quality and Professional Development oversees all official nurse-led projects in the organization system. This was an imperative step to market the program and garner support. Additional stakeholders included the Advance Practice Nurse Director, Nurse Leaders on the units implementing the project, Advance Practice Finance, the Senior Financial Manager and Telehealth Technology Department. The nurses who will be involved in the program are also critical marketing targets.

Globally, this project improves the organization brand, which makes it synonymous with a brand of excellence regarding cancer care known to the public. This project provides an opportunity to improve Press-Ganey® patient satisfaction scores.

Once the project is complete and data and findings are compiled, it will be prepared into a manuscript, and poster presentation, marketed, and submitted to oncology nursing journals for publication. This project is an excellent example to present to national conferences for knowledge dissemination.

Stakeholder Analysis

The project's focus was one that each nurse in the office practice setting engages in daily in patient care. It was critical to actively engage these nurses, as well, by providing clear information on how the project stands to benefit their patient population. When engaging the nursing and executive leadership, it was critical to emphasize the minimal financial costs, as well as the benefits of utilizing the newly developed telemedicine dashboard application. The potential impact to cost savings to the institute while focusing on the latest technology available is synonymous with the organization's brand. Eliminating variation in process and standardizing chemotherapy education practices through detailed planning of educational content and training for oncology office practice nurses has been linked to improved patient satisfaction, increased knowledge of side effects related to chemotherapy, and increased efficacy of nursing staff regarding time and quality of care provided to patients (Dalby et al., 2013, Thompson, et al., 2013). With an emphasis on current literature, it was determined that the plan identified the target market, the value proposition of the product, campaigns to be initiated, and the metrics to be used to assess the effectiveness of marketing initiatives. The marketing plan was adjusted

on an ongoing basis contingent on the findings from the metrics that show which efforts have an impact and which do not.

An emphasis on the proposed standardized developed chemotherapy education method that is nurse-led illustrates that having dedicated time to educate patients and caregivers about treatment, as a separate clinic visit appointment, has improved outpatient clinic time management, and increased personalized care for these patients (Jivraj et al., 2018). The class provides a platform for the development of other, disease-specific patient education programs that can be offered in a variety of ways (Brockbank et al., 2015 & Davison et al., 2014). The literature emphasizes that patient education should be evidenced-based, provided at multiple time points, in a quiet environment, and all nursing patient education documentation should be uniform (Garcia, 2014; Marcus, 2014; & Portz & Johnston, 2014). Providing telemedicine services for educational services adds the benefit of improved medication management, patient quality of life, and reduced healthcare costs (Haleem, Javaid, Singh & Suman, 2021).

This project was submitted to the Quality and Professional Development committee for approval. Upon approval, it was determined that final Institutional Review Board (IRB) approval was not required. Findings from completed literature review were shared with the stakeholders and marketing targets to increase knowledge base, as well as augment buy-in, as the potential benefits of the pilot were understood. Short and long-term goals of the project were reiterated, and a timeline for the project implementation and findings dissemination shared.

Project Outcomes

Evaluation

This QI pilot analyzed data from Pre-Tests and Post-Tests, Patient Satisfaction Surveys, and Nurse Satisfaction Surveys for the project implemented between June 2022 and December 2022. Participants consisted of patients newly diagnosed with breast cancer, undergoing initial chemotherapy treatment. Each participant completed a one-hour standardized chemotherapy education class including verbal, written, and multimedia components implemented via a telemedicine platform.

Data were gathered and analyzed to compare Pre-Test and Post-Test questions (see Appendix B) to evaluate knowledge gained from the educational program. A Patient Satisfaction Survey (see Appendix C) with 20 questions based on a five-point Likert scale was collected and data analyzed, compared, and illustrated group data on the Patient Satisfaction Survey Graph. The Patient Satisfaction Survey focused on evaluating attitudes and experiences with the telemedicine experience, while evaluating educational experience. The goals of the survey were to measure perceived patient satisfaction with telemedicine. Pre-Test and Post-Test Scores (see Appendix E) were evaluated and analyzed to assess knowledge retention.

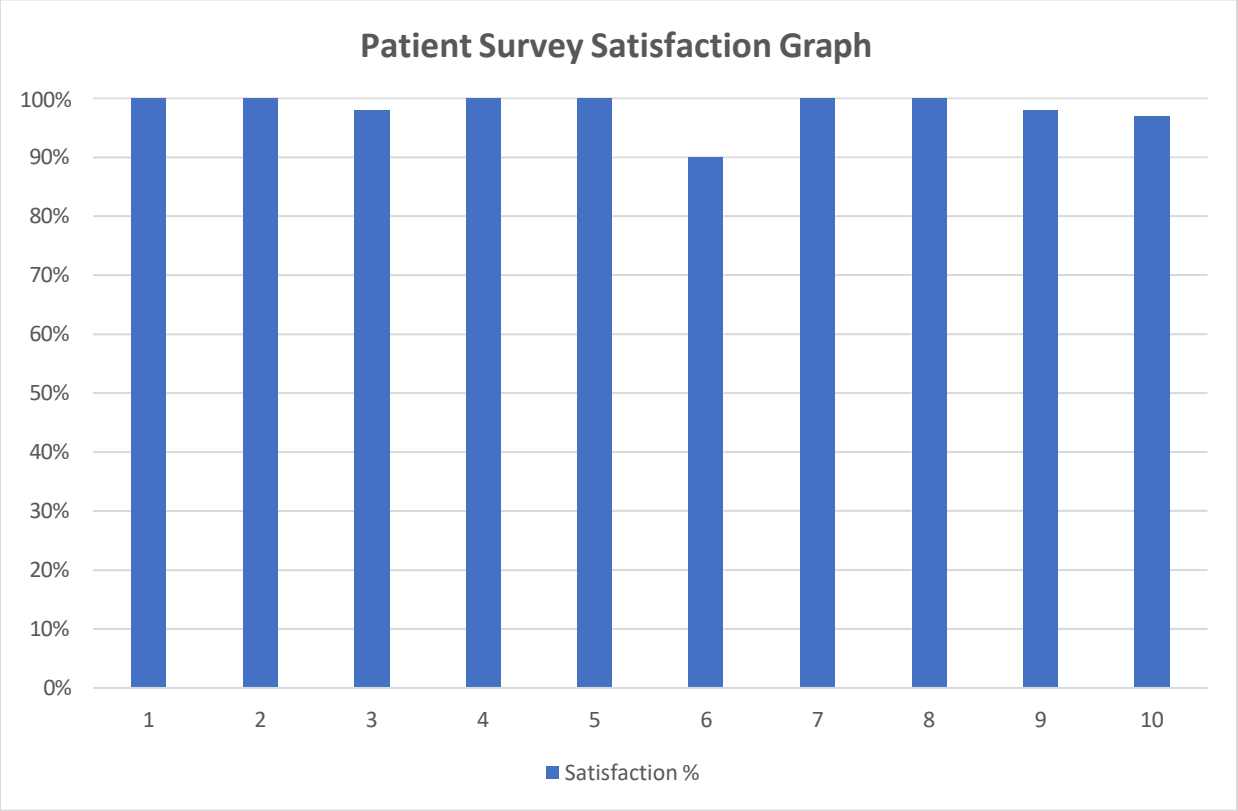
Results

Among participants (n=10) who completed the Patient Satisfaction Survey, 93% agreed positively about Ease of Access to the telemedicine dashboard. Overall, 100% agreed positively about Satisfaction with the Information and Materials received. Participant scores revealed 98% agreed that the class prepared them for their first chemotherapy. Eight of the ten participants agreed that the class prepared them to better manage potential chemotherapy side effects, scoring 5 on the Likert Scale. Participant 10 scored 2 on the Likert Scale and participant 9 failed to

answer ten of the twenty questions. Participant 9 anecdotally commented that she had a poorly perceived telemedicine experience, starting with difficulty scheduling the class, with poor at home internet connectivity as a contributing factor. This led to an inability to understand key concepts taught and not feeling prepared for the first chemotherapy. This participant commented that the class was taught at a level that was difficult to understand and agreed that anxiety was a confounding factor. Ultimately, the participant did not feel the class taught them when it was important to contact the health provider team and proposed a need for additional time to be allotted for the class. Despite these difficulties, the participant selected all high scores for the remaining questions including overall satisfaction with the information and materials received and high scores for the nurse who taught the class. One compelling request voiced from a participant was, "I wish I could have a program that was self-directed, that I could navigate on my own after the class to review key concepts." Another participant anecdotally made a similar request stating, "Overall, I was pleased with the class performed over the telemedicine platform. I would benefit from an audio-visual multimedia program that was geared to review the concepts where I lacked full comprehension. My preference would be multimedia, not written material for review." Another participant scored all 5s on the Patient Satisfaction Survey; however, this participant scored 2 on rating how the class prepared them to better manage potential chemotherapy side effects.

Figure 2

Patient Survey Satisfaction Graph



Pre-Test and Post-Test Scores were analyzed, indicating 8 of 10 participants had an overall improvement of score in the Post-Test Score. Two participants scored lower in the Post-Test than on the Pre-Test. All twenty questions were analyzed and three were found to have lower scores on the Post-Test. This may indicate a lack of knowledge or understanding about a key concept. This may indicate that not all topics were covered comprehensively in the class or if perhaps the question was poorly worded. It may also identify a weaker student with a lack of improvement in their scores. The Pre-Test and Post-Test can be used for more effective teaching. After the Pre-Test identifies the weak students in a class, it alerts the teacher to provide extra remedial instruction. If the Post-Test showed that most students did not learn the topic, then the

nurse would revise their teaching method and perhaps use a different teaching material for reinforcement. Factors that may affect the validity of the test include length of test, unclear direction, reading vocabulary and sentence structures which are too difficult, inappropriate level of difficulty of the test items, poorly constructed test items, including ambiguity, and test items inappropriate for the outcomes being measures.

Figure 3

Patient Pre-Test and Post-Test Scores

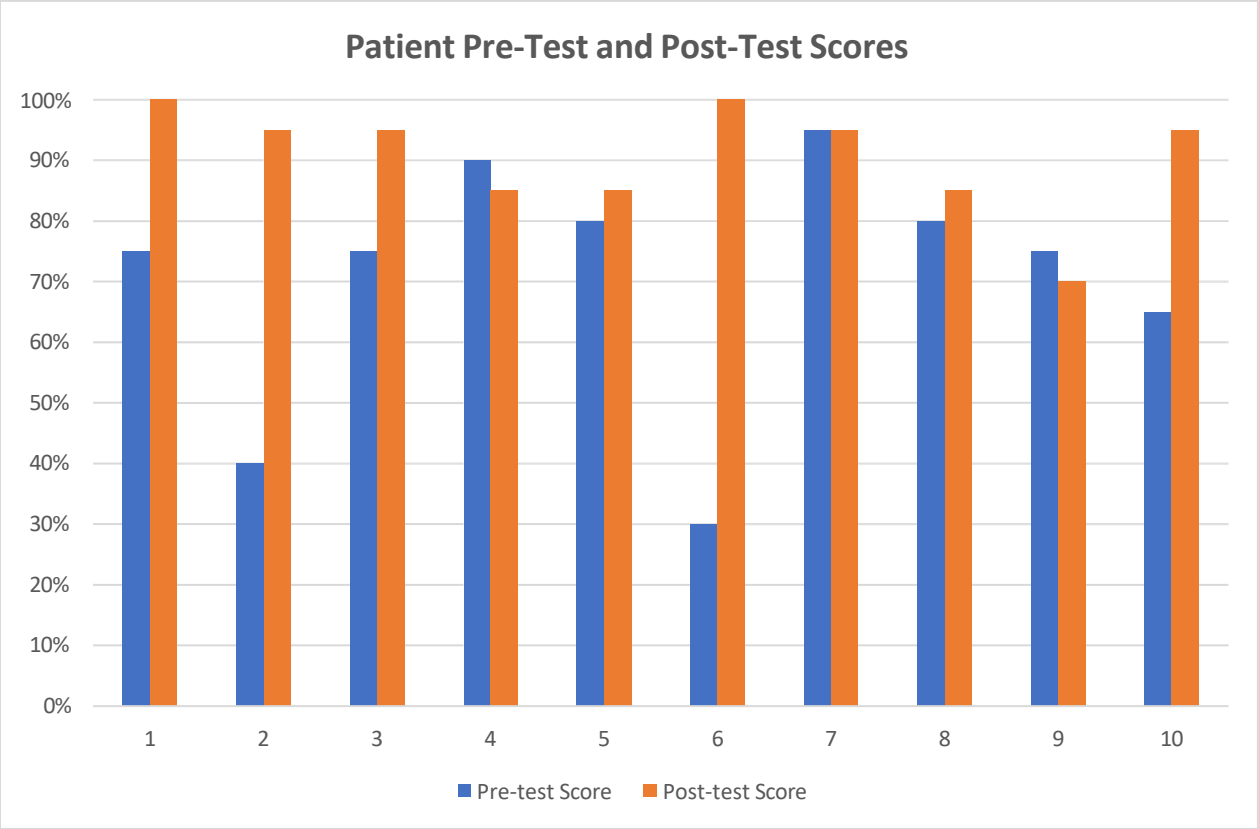
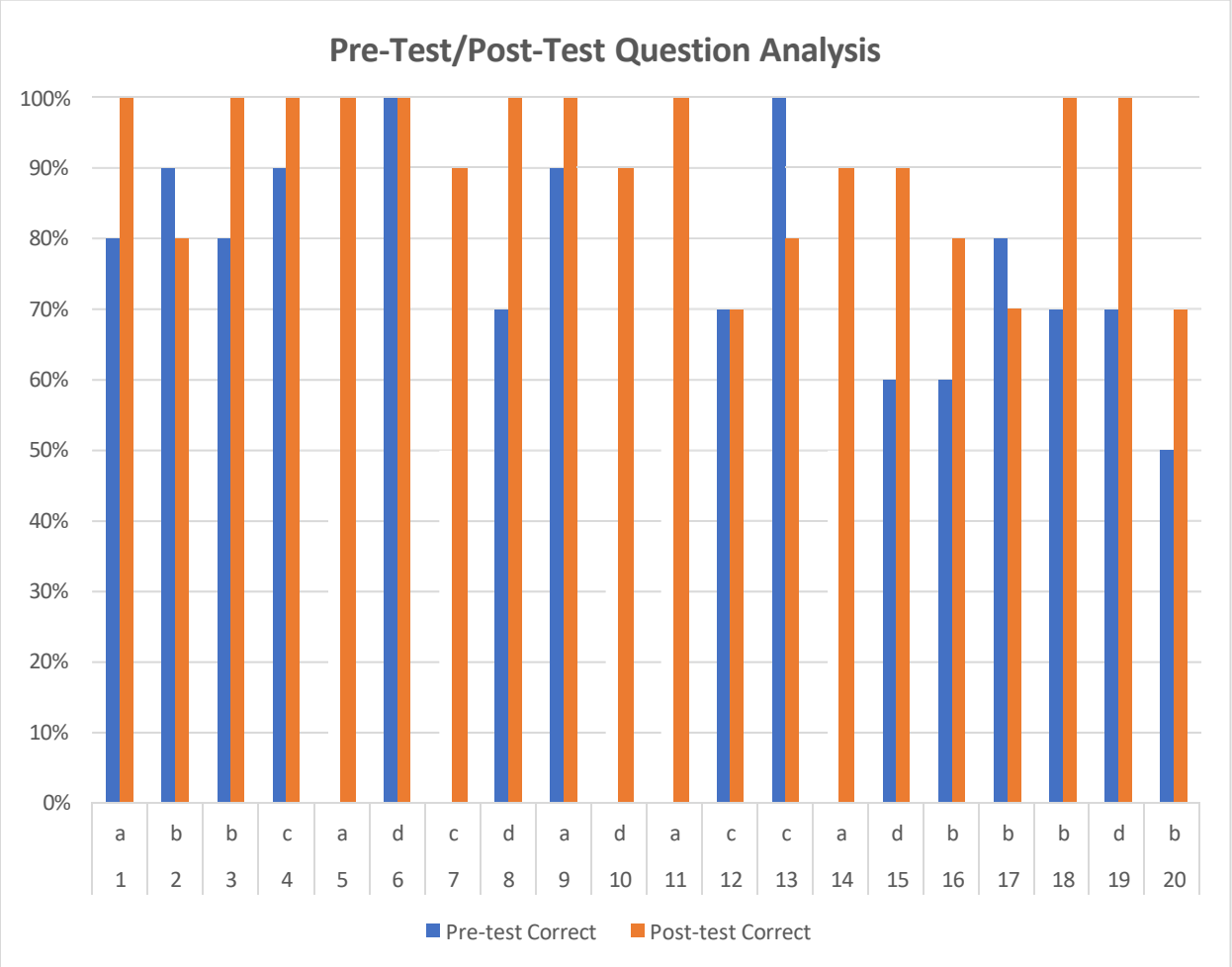


Figure 4

Pre-Test/Post-Test Question Analysis



Survey Data Analysis

The QI project initiator surveyed the nursing staff that taught the standardized chemotherapy education class over the telemedicine platform to assess perceived satisfaction and efficacy using telehealth. The total sample size was three. One hundred percent of the providers

participated. The survey used a five-point Likert scale to gather data on nurses perceived satisfaction with telehealth and its efficacy to assess and treat patients with Score 1 (Strongly Disagree); 2 (Disagree); 3 (Undecided); 4 (Agree); and 5 (Strongly Agree). The survey also asked participants to comment on questions. For example, staff were asked if the process to access telemedicine was satisfactory for patients. The majority responded that patients were able to easily access the telemedicine platform from home; however, one staff participant cited that many patients had difficulty accessing the platform and some preferred telephone over video. As another example, staff were asked if the separate educational class was less anxiety-producing for the patient. The majority responded that it was less anxiety-producing for the patient, giving the patients time to process their diagnosis and plan of care. Another example asked staff if the separate class for education performed over the telemedicine platform was less anxiety-producing for the staff. The majority responded positively, stating the separate appointment provided the nurse time to prepare the material outside of the busy clinic day. One staff member noted this was dependent upon the patient and time constraints of the clinic. On busy days, the staff member expressed that teaching in real time can be a stressor. All participants voiced some concern that adequate time to schedule the class on a non-clinical day posed some concerns. One participant thought it was manageable if there was adequate staffing. While another participant disagreed that there was not enough time to schedule the class on a non-clinical day. The third participant agreed scheduling was challenging, noting patients have time constraints and when in clinic, RNs have little time. On non-clinic day, coverage assignments are often very busy and coordinating an hour of time that works for both the patient and the RN staff member is challenging. Additionally, if treatment were to start within the week, there were very few

available days for education as patients are generally still having other appointments for their work-up and still working, etc.

All staff participants agreed that standardized patient education decreases practice variability, and that the class prepared patients for first time chemotherapy while preparing patients to better manage potential side effects. All agreed that separate chemotherapy education appointment time increases efficiency.

Overall staff satisfaction with the three participants is 86% with a strong overall positive response about telehealth and its perceived efficacy. Participant 1 and Participant 2 had strong satisfactory scores of 90% and 94%, respectively. Participant 3 score of 74% was skewed by their strong belief that in-person training was preferable to telehealth.

Comments from the survey highlight the limitations in its use noted above. It is reasonable to say that patients diagnosed with breast cancer undergoing chemotherapy for the first-time may benefit from standardized patient education delivered over a telemedicine dashboard.

Review of Goals and Objectives

Goals

1. Show by survey that the program was accepted by at least 70% of staff and supported to improve patient care. Each staff member had a perceived satisfaction score of 74% or better with an overall perceived satisfaction rate of 86%. All staff members were satisfied.

2. Increase patient perceived satisfaction with the telemedicine program to a rate of 95% or higher. The overall perceived satisfaction rate of 98% with the telemedicine program was obtained.
3. Show by survey that class prepared patients for the first chemotherapy to a rate of 95% or higher. All patients scored a 4 or 5 on Patient Satisfaction survey indicating 100% of patients were prepared for the first chemotherapy.
4. Show by survey that the class prepared patients to better manage potential chemotherapy side effects to a rate of 90% or higher. The overall patient population score was 93% for perceived preparedness to better manage potential side effects. Eight of nine patients that answered this question scored 5 on Patient Satisfaction survey. One patient did not answer the question. One patient scored 2 on the Patient Satisfaction survey.

Summary, Recommendations, and Conclusions

Discussion

The necessity of a standardized chemotherapy education program delivered over a telemedicine platform demonstrates value to respective stakeholders of a telehealth program: patients and clinicians alike. Telemedicine is perceived as safe and effective and has been used to successfully augment existing patient education.

All attributes and component parts of this pilot meet the criteria of a successful telehealth business model. It remains important, however, to continue to monitor quality metrics through survey, Press Ganey Scores® and allow opportunities for both patient and staff feedback as the program continues to develop. Metrics to consider are satisfaction, technical performance, and financial impact. This includes average cost per visit, how far the patient would have had to travel for an in-person appointment and whether the number of "no-shows" changed. Consideration must be afforded to patient preferences as to visit type in respect to delivery of best quality care with incorporating telemedicine chemotherapy education.

Recommendations

Future projects of a self-directed multimedia audio-visual program are being considered with respect to chemotherapy education. The utilization of learning technologies combined with traditional in-class teaching are still a developing teaching approach and predictors of learning effectiveness remain unclear (Hao, 2016). Future roles of self-directed learning, technology readiness, and patient motivation in the chemotherapy education setting providing education and learning facilitation have not been sufficiently explored. Blended learning environment when combining both in-person and technology learning settings provides insight for future instructional strategy adoption to augment existing programs at the institute. Course designers

and instructors will need to recognize the value of fostering a student's need for self-directed learning in a flexible learning environment. Consideration must be given to patient preferences in delivery of quality care to patients and caregivers.

Sustainability

Satisfaction, utilization, and continued support from key stakeholders are drivers to support sustainability of the program going forward. Developing and implementing a sustainable telehealth practice involves multiple steps to establish a successful and financially stable practice. Obtaining staff input with ongoing telehealth training and education programs for staff and patients alike is key to success and sustainability. Training should continue to be offered to all providers on a regular basis, such as upon hire, when there are significant changes to the system, and annually as a refresher with regular system support availability. Training strategies may include developing an educational curriculum for users, developing a standard call flow format and triage processes for nurse lines or medical call centers, and expanding patient education materials to include common complaints.

A successful telehealth program needs patients who are aware of the program and who are willing to use it. The organization must not only promote its telehealth program, but also educate patients on how to use it. A successful and sustainable telehealth practice must be planned for all types of interactions with providers and staff. Patients who are comfortable using telehealth technology and feel supported by staff are more likely to continue using telehealth and refer others to the practice.

Limitations

Methodological limitations of this QI project included sample size. A challenge existed due to the limited sample size. As with a pilot study, small sample size can yield insufficient size

for statistical measurement. A larger sample size would ensure a representative distribution of the population and be considered representative of the group of patients and staff alike that participated in the pilot. This data could be better generalized. This study lays the groundwork to consider a practice change in the method in which initial chemotherapy education is taught.

Another characteristic of the design that may have impacted or influenced the interpretation of the results includes the limited number of staff available to perform the education class over the telemedicine platform. Utilizing three staff nurses may have skewed the data. A larger staff sample performing the educational class and surveyed could yield results more representative of the overall group of medical oncology staff office practice nurses within the organization. There were limited staff to perform the separate one-hour class and the staff limited by perceived dedicated time. The staff found it stressful to schedule the dedicated educational class. For example, in the clinic where there were two dedicated staff nurses, it was far more convenient to dedicate a specific time in the day to schedule the necessary prechemotherapy teaching. Critical appraisal of this component of the pilot highlights the impact of the required dedicated time and staff required to educate patients for their pre-chemotherapy education. Limited staff exist with only three dedicated breast medicine office practice nurses on the service. All three were key stakeholders. Access to available staff and their time constraints are key factors should the institute consider the acceptance of the pilot and involving a boarder range of staff and stakeholders for future implementation. Hiring a dedicated nurse/teacher/navigator for chemotherapy teaching may be a proposed solution for future implementation.

Conclusions

The widespread inherent use of telemedicine for chemotherapy education was made clear in this project. A standardized chemotherapy curriculum reduces practice variability. Patients and staff alike were highly satisfied with its efficiency, quality of care, and effectiveness in preparation for first-time chemotherapy and preparation to better manage potential side effects.

The outcomes of a standardized patient education program were increased patient quality outcomes with preparedness for chemotherapy, increased patient satisfaction, reduced variability with teaching methods, improved systems efficiency, improved effectiveness, and improved quality of care.

The successful completion of this QI project suggests prospective telehealth usage in other unrealized fields of healthcare, which further increases access to broaden the patient scope across the cancer continuum. A successful telehealth business model for a telehealth program initiative begins with a knowledge of financial variables and ends with a symphony of organized and efficient operations. The potential for telehealth to affect traditional healthcare is strongly positive. Application of telehealth and its global outreach scale impacts patients in remote areas with increased access to high-quality, specialized healthcare. The time is now to move care delivery forward, from event-based to ongoing preventative medicine that puts an empowered patient at the center of their own healthcare--putting telehealth at the forefront.

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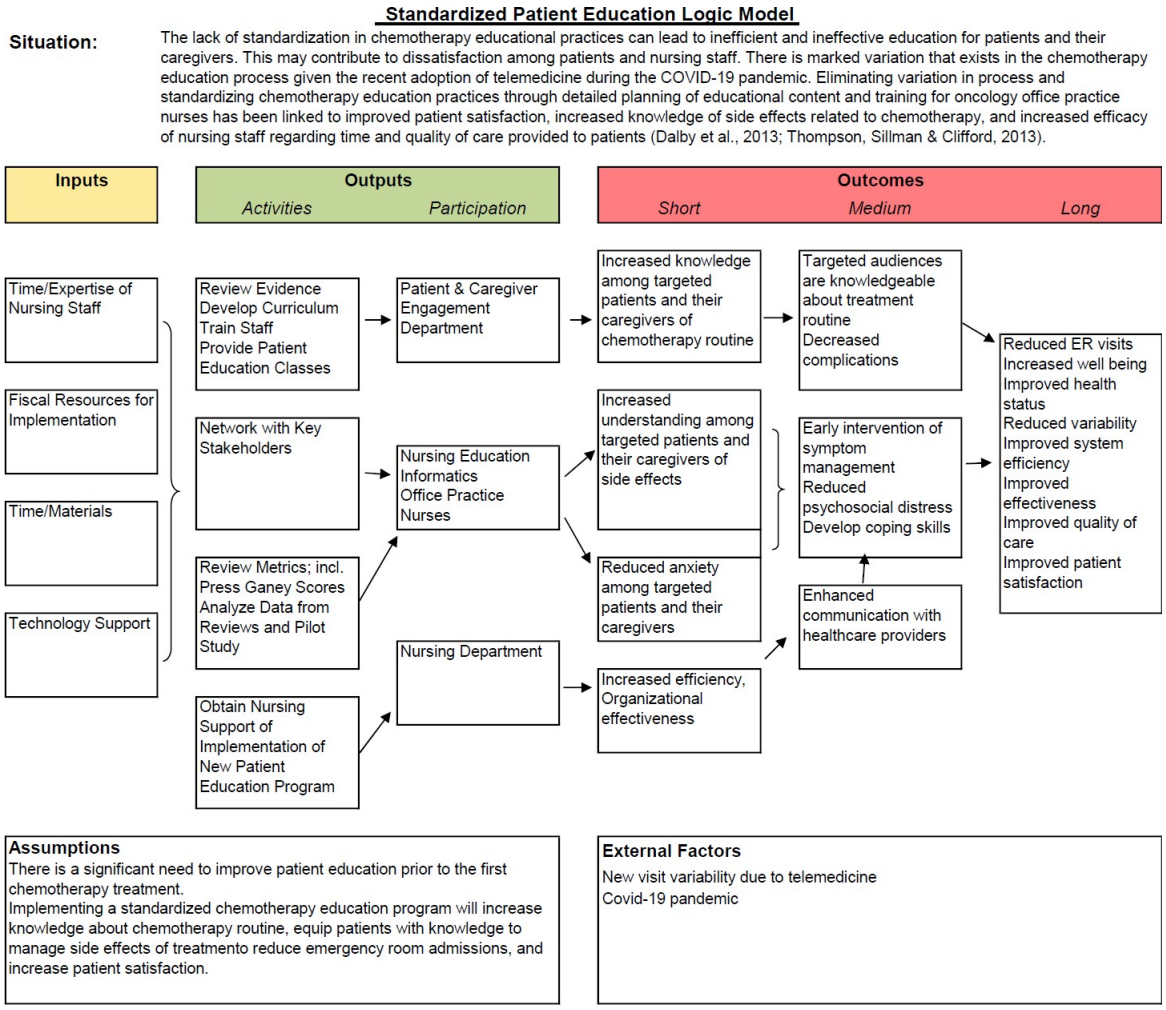
Appendices

Appendix A

Implementation Plan Logic Model.



Appendix B

Pre-Test/Post-Test

The pre-test/post-test process has two primary objectives. First, the pre-test can be used to assess prior knowledge. Second, when used in conjunction with a post-test it can be used to assess learning in a current course.

1. Breast cancer is a disease in which cells in the breast:

    a. grows and multiply abnormally

    b. comes from a gene from your mother

    c. comes from a gene from your father

    d. comes from a gene from both your mother and father

2. When genes in a cell that control growth no longer work:

    a. then chemotherapy is the only option

    b. then the cell divides uncontrollably

    c. then cells turn into cancer

    d. then there is no cure

3. Most breast lumps:

    a. spread into the surrounding tissue

    b. are benign

    c. destroys the surrounding tissue

d. cause other tumors to develop

4. If malignant tumors are left untreated, then:

a. cancer can spread (metastasize) to other parts of the body

b. can be life threatening

c. both a. and b.

d. does not cause much damage because they are slow growing

5. Genetics plays a part of inherited cancers

a. 5 to 10 percent of breast cancers are inherited

b. 25 percent of breast cancers are inherited

b. 50 percent of all breast cancers are inherited

c. 90 percent of all breast cancers are inherited

6. Signs of breast cancer include:

a. a nipple that becomes sunken (inverted), red, thick, or scaly

b. breast milk after stopping nursing

c. breast changes with skin pitting that looks like the skin of an orange

d. both a. and c.

7. A breast cancer is diagnosed by:

a. mammogram

b. ultrasound

c. biopsy

d. CT Scan

8. Breast cancer treatments include:

a. Surgery, radiation and chemotherapy are the only way to treat breast cancer.

b. hormone therapy medications

c. targeted therapy drugs

d. all the above

9. Chemotherapy:

a. destroys cells; stops cancers from spreading; and slows the growth of cancer cells

b. stops cancers from spreading and slow the growth of cells only

c. destroys cells

d. makes people sick

10. Routes of chemotherapy:

    a. a cream that is rubbed on your skin.

    b. intravenous and pills

    c. a shot into muscle or other part of your body

    d. all the above

11. Fatigue is feeling unusually tired, weak, and like you have no energy

    a. doing physical activity and exercise may help cancer-related fatigue

    b. sleep as much as you can, so you can get the rest you need

    c. drink caffeinated beverages to combat fatigue

    d. there is nothing you can do to alleviate fatigue

12. Some chemotherapy can cause nausea (feeling like you're going to throw up)

    a. caffeine is the best way to manage nausea

    b. chemotherapy irritates areas of the brain that control nausea

    c. eating small frequent meals day and night helps

    d. only your anti-nausea will help this type of nausea

13. Acupressure is an ancient healing art to reduce nausea and vomiting. All the following statements are true, except:

a. acupressure is based on traditional Chinese medicine practice of acupuncture

b. pressure on specific places of the body may reduce nausea

c. pressure point P-6 (Neiguan) is located on your ankle

d. doing acupressure on the Neiguan P-6 can help relieve nausea and vomiting related to chemotherapy

14. Constipation can occur during chemotherapy

a. if you have not had a bowel movement or passed gas for more than 2 to 3 days, patients should call their healthcare provider

b. eating foods that are high in protein can help you manage constipation

c. if needed take laxatives first

d. only stool softeners such as Colace should be taken

15. Mucositis (myoo-koh-SY-tis) can happen during chemotherapy. Mucositis is redness, swelling, tenderness, or sores in your mouth or on your tongue or lips. What is the best way to manage?

a. stop chemotherapy

b. gargling with alcohol-based mouth was clears up mouth sores quickly

c. gargle with salt water only

d. tell your healthcare provider if you have mouth sores and cannot eat or drink

16. Neutropenia (new-tro-PEE-nia) (Low white blood cell)

a. everyone that does cancer treatments has a weakened immune system

b. if patients have neutropenia, they are at greater risk for infection

c. washing your hands for 2 minutes will reduce infection

d. if patients have neutropenia, a little scratchy throat really doesn't matter much

17. Hair thinning or hair loss. All statements are true, except:

a. after hair loss during chemotherapy, it may grow back a different color or texture

b. all chemotherapy causes hair loss

c. if you lose your hair, it will begin to grow back a few months after your last treatment

d. scalp cooling may help you retain your hair

18. When to call your health provider:

a. mild cold symptoms don't need to be reported to my health care provider

b. report fever when100.4 degrees

c. report fever when101 degrees

d. report symptoms only during normal business hours

19. Skin and nail changes

a. chemotherapy can cause darkening of skin, nails

b. chemotherapy can cause darkening of the tongue

c. chemotherapy can cause darkening of the veins in which you received the chemotherapy

d. all the above

20. Managing side effects

a. the best way to manage side effects of chemotherapy is to wait to discuss them in your pre-chemotherapy appointment.

b. the best way to manage side effects of chemotherapy is to contact your healthcare provider

c. the best way to manage side effects of chemotherapy is check in with your favorite blog or friend that had chemotherapy

d. the best way to manage side effects is to read the information your health provider gives you in the folder

Appendix C

Patient Satisfaction Survey

Using a Five Point-Likert Scale

SCORE 1(Strongly Disagree); 2 (Disagree); 3 (Undecided); 4 (Agree); 5 (Strongly Agree)

1. Ease of Access to the telemedicine dashboard… 1 2 3 4 5
2. Usefulness of the information in the class… 1 2 3 4 5
3. Delivery method…..... 1 2 3 4 5
4. Font size on information….....1 2 3 4 5
5. Instructions on the entire processes during information given… 1 2 3 4 5
6. Nurses listened patiently… 1 2 3 4 5
7. Nurses answered questions appropriately… 1 2 3 4 5
8. Friendliness of nurse 1 2 3 4 5
9. Concern shown by nurse 1 2 3 4 5
10. Ease of scheduling the class…..... 1 2 3 4 5
11. The class was taught in plain language 1 2 3 4 5
12. The class prepared me for my first chemotherapy… 1 2 3 4 5
13. The class prepared me to better manage my potential chemotherapy side effects……1 2 3 4 5
14. Telemedicine experience expectation… 1 2 3 4 5
15. The class taught at a level that was easy to understand….....1 2 3 4 5

16. The class taught me when it is important to contact my health provider…. 1 2 3 4 5

17. There was adequate time for questions… 1 2 3 4 5

18. Likelihood to recommend the practice.....1 2 3 4 5

19. There was enough time allotted for the class 1 2 3 4 5

20. Overall satisfaction with the information and materials received…. 1 2 3 4 5

Appendix D

Nurse Satisfaction Survey

Using a Five Point-Likert Scale

SCORE 1(Strongly Disagree); 2 (Disagree); 3 (Undecided); 4 (Agree); 5 (Strongly Agree)

1. Standardized Patient Education decreases practice variability… 1 2 3 4 5
2. The class prepared patients for first time chemotherapy…..... 1 2 3 4 5
3. The class prepared patients to better manage potential side effects…..... 1 2 3 4 5
4. A separate chemotherapy education appointment time increases efficiency. 1 2 3 4 5
5. The process to access Telemedicine was satisfactory for patients… 1 2 3 4 5

   Comments:

6. The separate class for education is less anxiety producing for the patient…..... 1 2 3 4 5

   Comments:

7. The separate class for education is less anxiety producing for the RN… 1 2 3 4 5

   Comments:

8. There is adequate time to schedule the class on a non-clinical day…..... 1 2 3 4 5

   Comments:

9. Telemedicine option is accepted by patients I have interacted with… 1 2 3 4 5
10. Telemedicine patient education improves patient care 1 2 3 4 5
11. Telemedicine is an acceptable alternative to in-person care for education… 1 2 3 4 5
12. Is there sustainability in Telemedicine usage for educational purpose 1 2 3 4 5
13. Telemedicine is satisfactory to use to assess and treat patients… 1 2 3 4 5
14. How satisfied are you with the use of Telemedicine…..... 1 2 3 4 5
15. Patients like multimedia format for education… 1 2 3 4 5
16. Would patients benefit form a self-paced interactive module for education..... 1 2 3 4 5
17. Would a self-paced interactive module assist the nurse with content review… 1 2 3 4 5
18. Should multimedia self-paced interactive module replace a separate educational session… 1 2 3 4 5
19. I would recommend Telemedicine method of education to specific patients..... 1 2 3 4 5

    Comments:

20. The process of Telemedicine has areas which need to be improved… 1 2 3 4 5

    Comments:

Appendix E

Seton Hall University IRB Exemption

SETON HALL UNIVERSITY
1 8 5 6

May 5, 2023

Karen D. Dougherty
Seton Hall University

Dear Karen,

The Proposal entitled "Standardized Patient Education for Patients' Initial Chemotherapy through an Integrated Telemedicine Platform" has been reviewed by the Research Ethics Committee of the Seton Hall University Institutional Review Board and based on the information provided we found the same to be exempt from IRB approval. The proposal does not involve human subjects. Further, - as for **45-CFR §46.104 Exempt research -**(5) Research and demonstration projects which are conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine: (i) Public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs.

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Thank you for your cooperation.

Phyllis Hansell, EdD, RN, DNAP, FAAN
Professor
Co-Chair, Institutional Review Board

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