IMPROVING CANCER SCREENING IN CLINICAL PRACTICE

by

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Dedication

For my mother, I would like to dedicate this to her loving care and determination in my success.

Without her faith in me, this would not be possible. I will make you proud mom.

Abstract

Cancer is one of the leading causes of death worldwide. Cancer screenings show a reduction in mortality and morbidity rates by early detection and prevention procedures. The most common types of cancer in the United States include breast, lung, prostate, colon, and melanoma. Primary care practices can increase the amount of cancer screenings completed by increasing provider knowledge and detecting cancer at earlier stages with the use of cancer screening guidelines. The purpose of this DNP project was to integrate routine cancer screenings into standards of care in this primary care practice through a quality improvement project with the goal of increasing cancer screenings in patients. Providers used data collection tools, which were a combination of the recommended cancer screening guidelines, during the three-month implementation period. Findings showed a 25% increase in post-project cancer screening compliance compared to the pre-project cancer screening compliance. Having cancer screening reminders for providers increases the chance of patients receiving the recommended screenings.

Keywords: cancer screening, cancer prevention, early detection, cancer guidelines

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Chapter One: Overview of the Problem of Interest

Cancer is one of the leading causes of death worldwide. Private clinical practices institute a variety of guidelines that screen patients for cancer based on past medical history, family history, risk factors and demographics. The current estimation is that 3% to 35% of premature deaths are avoidable through screening (National Cancer Institute, 2017). Allowing providers to diagnose patients in earlier stages of cancer may reduce the patient's morbidity and mortality. The stage of cancer at the time of diagnosis determines treatment options and survival rates. Multiple factors determine a patient's prognosis, which include cancer type, cancer cell characteristics, cancer stage or grade, and if cancer has spread to other areas of the body. Patients diagnosed with cancer at earlier stages may achieve better outcomes than patients diagnosed with advanced stage cancers.

Background Information

According to the National Cancer Institute (2017), 8.2 million people died from cancer-related deaths worldwide in 2012. In 2016, there were around 1,685,210 new cases of cancer in the United States and approximately 595,690 people died from the disease. The most common types of cancer include breast, lung, prostate, colon, and melanoma. Fortunately, the top common cancers diagnosed also have evidence-based screenings, which if implemented into practice can reveal these potential cancers at earlier stages. Types of evidence-based screenings used in practices include mammograms and clinical breast exams for breast cancer; low-dose helical computed tomography (CT) scan for lung cancer; prostate specific antigen (PSA) for prostate cancer; colonoscopy and high-sensitivity fecal occult blood tests (FOBTs) for colon cancer; and skin assessments for melanoma and other skin cancers.

Breast Cancer. Breast cancer was the most common type of cancer diagnosed in 2017. Annual wellness visits evaluate breast cancer risk factors. Besides being a female, the greatest risk factor for developing breast cancer is increasing age. Other risk factors include early menarche, late menopause, alcohol consumption, family history of breast cancer, and increased breast density (PDQ Screening and Prevention Editorial Board, 2018). The Centers for Disease Control and Prevention (CDC) list many screening tests available for breast cancer that include mammography, breast magnetic resonance imaging (MRI), clinical breast exam and breast self-awareness. Though guidelines vary as to which age women should begin having annual mammograms, most guidelines say to begin mammograms at 50 years of age. Patients who are at a higher risk of developing breast cancer may have a mammogram ordered as young as 40 years of age (Centers for Disease Control and Prevention, 2017). In addition, if any abnormality presents itself during a clinical breast exam, a patient may need a mammogram or other diagnostic test to rule out malignancy.

Lung Cancer. Though breast cancer is the most commonly diagnosed cancer in the United States, lung cancer is the leading cause of cancer-related deaths. Currently, the only lung cancer screening offered is the low-dose helical CT scan to patients who meet specific criteria. The criteria include the patient being 55-80 years old, have a 30 pack-year history of heavy smoking, and is currently smoking or has stopped within the last 15 years (Centers for Disease Control and Prevention, 2018). The patient must meet all three criteria requirements to have a CT ordered. Lung cancer screening is a resource for patients who present with risk factors, and education on smoking cessation should always be encouraged (Schabath, 2018).

Prostate Cancer. Men 50 years of age and older should have a PSA drawn during annual well visits to screen for prostate cancer. The PSA may read high since other aspects can cause

this to rise. If the PSA is high, the patient will have a biopsy to determine if the patient has, cancer cells present (Centers for Disease Control and Prevention, 2017). PSA lab tests are cost-effective and prove to be a reliable source for prostate screening. Periodic screening over time enables providers to monitor a rise in PSA levels (Barry, 2018). Some prostate cancers are slow growing, while others appear more aggressive. Watchful waiting is an appropriate choice for certain patients, but others require different treatment options, which include radiation and removal of the prostate.

Colon Cancer. The recommended guidelines are to screen all patients between 50 and 75 years of age for colon cancer. There are many screening tests and procedures conducted on patients to check for cancerous cells, which include FOBT, fecal immunochemical test (FIT), flexible sigmoidoscopy, colonoscopy, and a CT colonography. The most utilized and efficient method to conduct in-office is the FOBT. The patient receives the results instantly and if positive, additional tests are ordered. Patients should begin to receive colonoscopies at age 50 and every ten years following a negative result (Centers for Disease Control and Prevention, 2017). Patients who identify as high risk, such as patients with Crohn's disease or a family history of colon cancer, should discuss earlier screening options with the health care provider (Ahnen & Patel, 2018).

Skin Cancer. In the year 2000, 84% of skin cancer diagnoses were in the localized stage, which meant that cancer had not spread to other parts of the body. This finding is why skin cancer screenings during wellness visits are such an important component to a physical examination. Currently, the CDC does not have guidelines as to which patients need skin assessments during visits (Centers for Disease Control and Prevention, 2016). Providers are now being educated on the importance of skin assessments during wellness visits, along with

providing education related to skin cancer prevention, such as proper sunscreen use and self-skin assessments (Loerze, Turnage, & Woodmansee, 2018). Wheatley (2018) mentioned asking each patient to completely undress and wear a gown for the provider to have a better inspection of the skin. This can make documentation simpler for the provider to make notes of the patient's skin instead of using generalized text in the electronic medical record.

Cervical Cancer. Cervical cancer also has an evidence-based screening, which is the Papanicolau smear (Pap test). It is a common procedure completed every three years in women ages 21-65. After 30 years of age, co-testing for human papilloma virus (HPV) occurs during the examination (Centers for Disease Control and Prevention, 2016). Cervical cancer has declined over the last several years due to incorporating the Pap test into clinical practice regularly. This decline corresponds to the education and distribution surrounding the Gardasil injection, which is for the prevention of HPV. Providers and parents have accepted this immunization, and young children and teenagers are receiving it regularly during physical examinations (Hawes, 2018).

Significance of Clinical Problem

Patients not screened appropriately may have an underlying type of cancer, which, if not treated, could result in increased healthcare cost and potential death. In 2010, the United States spent a total of $125 billion dollars on cancer care alone (National Cancer Institute, 2017). By increasing the usage of evidence-based cancer screenings in private practices during wellness visits, this may decrease the burden of costs on patients and family members. One of the most imperative factors that influence the cost of cancer care is the stage of development at the time of diagnosis. Cheung et al. (2018) discussed that finding cancer at stage I, rather than stage II, III, or IV, reduced the number of economic burdens on the patient and family. An evaluation of cancer funds determined the amount spent on treatments and procedures of various stages of

gastric cancer over time. Cancer, particularly gastric cancer, showed that early detection reduced healthcare costs substantially. Anonson, Holtslander, Ogunkorode, & Maree (2017) stated that breast cancer created heavy burdens with high mortality rates and economic costs. However, establishing early detection guidelines and education improved survival rates and healthcare costs associated with cancer.

Many practices have guidelines enforced to screen for cancer, and providers utilize these guidelines during patient care. Though providers acknowledge the benefits of cancer screenings, providers may overlook components of these guidelines in practice (Crothers et al., 2018). Private practices may incorporate guidelines, but providers may be too busy or simply forget to conduct the cancer screening process on patients who meet the criteria. There are multiple methods of how to increase screening rates in private practices. Incorporating practice facilitation and academic detailing into primary care practices showed an increase in a patient's health (Epling et al., 2016).

Question Guiding Inquiry (PICO)

The purpose of this DNP project was to integrate routine cancer screenings into standards of care in this primary care practice through a quality improvement project with the goal of increasing cancer screenings in patients. The clinical question will be "How can providers incorporate a routine process for evidence-based cancer screenings in a private primary care clinic?"

Population. Providers screened patients 18 years and older for the top six types of cancer based upon history and demographics.

Intervention. Providers implemented an evidence-based cancer screening tool created from utilizing the CDC and United States Preventive Services Task Force (USPSTF) guidelines into clinical practice.

Comparison. The current use of cancer screening protocols at [redacted] versus the use of cancer screening protocols at [redacted] after implementation of an evidence-based tool into practice is the comparison.

Outcome. [redacted] experienced an increase in the use of cancer screening protocols over the implementation period of three months.

Summary

Cancer claims the lives of many people worldwide. Evidence-based cancer screenings improve outcomes of patients with this disease. Private clinical practices have implemented cancer screening guidelines into general wellness visits for patients who have positive risk factors or meet demographic criteria. Providers may lack key components needed for evidence-based cancer screening implementation for a patient's plan of care. Education to providers is key for increasing the cancer screening rates in clinical practices. The goal for this project was that providers will implement evidence-based cancer screening guidelines from the CDC and USPSTF, which will involve screening patients 18 years and older for cancers, with a goal to improve screening rates in a private clinical practice.

Chapter Two: Review of the Literature

There is a substantial amount of literature on the broad topic of cancer. The subcategory, cancer screenings, still present a generous volume of data and resources to review. Over the past several years, cancer organizations created and revised screenings for multiple types of cancer. Cancer databases, such as the National Cancer Institute (NCI), the CDC, and the USPSTF, establish screening guidelines and protocols for routine patient care throughout the United States. The creation or revision of guidelines directly relates to the evidence found that contrasts the current protocol. Providers should review literature related to cancer screenings periodically as preventative care advances.

Methodology

Databases utilized for the literature review included PubMed/Medline and CINAHL. There is a significant amount of literature on the development and implementation of cancer screenings in private clinical practices. Aside from scholarly nursing journals, cancer databases provided information regarding cancer screening guidelines and cancer statistics. Inclusion criteria included articles directly related to cancer screenings in primary care practices. The search also included articles related to specific types of cancer and the appropriate screenings available for that type of cancer. Articles had to be in English, with adult populations, and in a primary care or community care clinic. Exclusion criteria were the articles with a narrow focus, which included specific cancer type and treatment options, generalized provider knowledge of improving patient care and innovative cancer diagnostic procedures. Other exclusions were articles not in English, older than ten years, editorials, information conducted with pediatric populations, information in acute care, and dissertations.

Sampling strategies. Several PubMed searches used keywords such as “cancer screenings”, “prevention”, “early detection”, and “primary care.” The literature search included keywords randomly paired. Examples include “cancer screenings” paired with “prevention”, and “cancer screenings” paired with “early detection.” This strategy yielded different results each time. Project relevancy determined keywords used in the searches. The articles chosen were within the last ten years. The articles chosen dated within ten years since many cancer screenings established approval during this time. A review of cancer databases assisted in the development of the literature review. The Literature Search Strategy Log includes all sampling strategies utilized in this review (Appendix A).

Evaluation criteria. The evidence matrix includes articles that are relevant to the project. Articles rate based on the level of evidence demonstrated. All the articles reviewed are either level I, II or III. Inclusive and exclusive criteria determine if the article meets the standards for this review. Filtering the remaining articles reveals the most relevant information needed for the project and implementation process. The Evidence Matrix includes all documented evaluation criteria (Appendix B).

Literature Review Findings

Based on the keywords used in the databases, there were multiple articles to review. Not only did the articles on cancer morbidity and mortality have similarities to one another, but the articles also had similarities to other articles that discussed provider knowledge and early detection of cancer. There was a consensus with the importance of evidence-based cancer screenings in primary care. A review of specific topics included increasing provider knowledge on cancer screenings, the importance of early detection in cancer patients, and cancer disparities.

Increasing provider knowledge on cancer screenings. Many providers are aware of the cancer screening policies in each practice. However, barriers can rise within a practice that makes it difficult for providers to spend an adequate amount of time with patients. Crothers et al. (2018) discussed that some of the barriers that prevent providers from addressing cancer screening include inadequate time, inadequate staffing and patients having multiple comorbidities. Addressing these areas in clinic, allows providers to screen patients properly. Fairley et al. (2018) stated that healthcare providers are missing the opportunity to talk with patients about cancer screening and cancer prevention. Providers may benefit from communication training on how to discuss the topic of cancer with patients during wellness visits. Communication topics should include the patient's risk, prevention methods, screening, and diagnostic procedures. When a provider's knowledge is increased, this increases a patient's knowledge, especially when dealing with the early detection of cancer.

Importance of early detection in cancer patients. A diagnosis made at an earlier stage of cancer, results in a better prognosis for the patient. Providers and patients are aware that early detection gives the patient a better quality of life. Chien & Poole (2017) mentioned how early detection of cancer has the potential to save many lives. The most appropriate way to discover cancer in the early stages is through cancer screenings, even if revisions of these screenings occur regularly. Between cancer screenings, prevention methods and patient-provider communication, these factors can reduce cancer morbidity and mortality.

Cancer Disparities. The diagnosis of cancer burdens many each year. Cancer affects the physical health of the patient, causes an economic burden from cancer costs, and creates emotional stress for both the patient and family. For example, breast cancer burdens patients with high mortality rates and economic costs. Through early detection screenings and proper provider

education, cancer disparities can decrease (Anonson, Holtslander, Ogunkorode, & Maree, 2017). The emotional stress of the patient and family can cause gaps in the diagnosis and treatment processes. Patients experience an increase in stress when receiving the diagnosis of cancer. The patient then may not recall all the information given at medical visits or consultations. Decreasing emotional stress and creating follow-up visits, ensures the patient understands all relevant information regarding the plan of care (Bosch et al., 2017).

Limitations of Literature Review Process

There were several limitations discovered during the literature review. The first limitation noted was the sample size of the studies conducted. The sample size of the articles collected was relatively small considering the number of people in the United States and worldwide. In addition, there was a limitation of the literature review on the timing of the studies. Many of the articles reviewed were of patients already diagnosed with cancer or cancer patients who already received treatment. These limitations did not affect the direction or potential outcome of the project.

Discussion

There were consistent reports throughout the articles selected that justified early detection and cancer screening as a beneficial factor in decreasing cancer mortality and healthcare costs. Crothers et al. (2018) discussed the barriers that prevent providers from addressing cancer screenings during wellness visits, and how adjusting these barriers allow patients to receive proper care. Fairley et al. (2018) stated how healthcare providers are not discussing cancer screening and cancer prevention with patients due to the barriers mentioned in the previous article. Chien & Poole (2017) stated that early detection of cancer has the potential to save many lives, and enforcing cancer screenings at each wellness visit is the first step in the process.

Anonson, Holtslander, Ogunkorode, & Maree (2017) added insight to the previous article stating that cancer created burdens on patients with high mortality rates and economic costs, but that establishing early detection guidelines and increasing provider education improved survival rates and healthcare costs. All these articles addressed similarities to the importance of early detection and enforcing cancer screening guidelines into healthcare practices.

Conclusion of findings. According to the literature findings, increasing provider education and awareness on the importance of cancer screenings and early detection procedures results in positive outcomes for the community. Early detection of cancer has shown to decrease cancer disparities, including cancer costs, cancer morbidity and cancer mortality. The barriers preventing providers from completing cancer screenings in practice are modifiable. Practices should incorporate evidence-based guidelines into current cancer screening protocols to enable providers to become more aware of the need to screen each patient accordingly.

Advantages and disadvantages of findings. There are multiple scholarly articles listed that demonstrate the need for quality improvement projects related to cancer screenings. The numbers of articles found provide substantial evidence for the need of increasing cancer screenings in private practices. Providers can help decrease cancer morbidity, cancer mortality and cancer-associated costs when practices accept and apply early detection screenings to patient care. Identifying barriers on cancer screenings in practice assist in the development of solutions. The recommended solutions from the evidence include increasing provider knowledge and increasing the number of early cancer screenings in a population.

Cancer screening guidelines consistently change with the growing amount of evidence-based literature available in healthcare. This can cause major issues when developing and implementing quality improvement measures within a healthcare organization. Although there is

evidence describing the importance of cancer screenings, providers are still missing key components of screenings during patient visits. Practices utilize different versions of cancer screening guidelines to screen patients. This can cause confusion when providers are determining the need for screening during patient care.

Utilization of findings in practice. Based on the literature findings, an evidence-based cancer screening tool was implemented into a private primary care clinic to remind providers to screen all eligible patients for cancers. The significance that surrounds increasing healthcare provider's knowledge on cancer screenings and the benefits that early detection offers is substantial. The patients, who are 18 years and older, were screened for cancer according to health history and demographics. An example of utilization of the screening tool will be conducting a clinical breast exam on a forty-year-old African American woman at a wellness visit. By increasing provider knowledge on the importance of conducting cancer screenings in practice, this will potentially improve screening rates, which in turn will reduce cancer morbidity and mortality.

Summary

There are numerous scholarly articles available on the topic of cancer screenings, and how providers should increase these screenings in clinical practice. A literature review concluded the importance of cancer screenings and early detection in practices. These topics in clinical practice are relevant to the database search conducted. Multiple resources were found regarding cancer screenings and included the benefits and barriers to screenings being implemented into practice. Literature review findings included increasing provider knowledge of cancer screenings, the importance of early detection in cancer patients and cancer disparities. Conclusive data reports on how early cancer screening implementation in clinics decreases

cancer disparities in patients. Utilization of the literature review findings will now be to implement an evidence-based cancer screening tool into a private primary care clinic to increase the number of cancer screenings conducted.

Chapter Three: Theory and Concept Model for Evidence-based Practice

Pender's Health Promotion Model describes the importance of health behavior and how it correlates with early detection and prevention of disease. Johns Hopkins Nursing Evidence-Based Practice Model discusses the importance of incorporating evidence-based change into projects.

Concept Analysis

Key concepts examined from the HPM for this project are "patient", "environment" and "health." A patient is a person who is receiving medical treatment. Patients express human potential through surrounding environments. Life experiences shape a patient's behaviors and characteristics, including health perceptions. An environment includes social, cultural, and physical circumstances where life can occur. The patient may alter the environment in a positive manner to enhance health behaviors. A patient's perspective defines health. The views of health include a human's potential for competent self-care, positive relationships with other individuals and maintaining structural integrity. Health adapts throughout the patient's lifespan (Nursing Theory, 2016).

Theoretical Framework

The nursing theory utilized for the project will be Pender's Health Promotion Model (HPM). Pender's HPM is a nursing model that assists in the prediction of health behavior (Appendix C). The HPM describes how humans interact with the environment to meet health goals. The HPM consists of three groups that influence health behavior, which include individual characteristics, behavior-specific cognitions, and immediate behavioral contingencies. This model focuses on increasing the patient's well-being. Pender created this model based on information found in other theories, such as the Social Cognitive Theory of Bandura and the

Value Expectancy Theory (Heydari & Khorashadizadeh, 2014). The HPM is a theoretical framework for projects to focus on the improvement of healthy lifestyles, and for detection of key components related to health behaviors. The HPM makes four assumptions: (1) individuals seek to regulate behavior; (2) individuals interact with the environment, transforming the environment as well as individual transformation; (3) health professionals are a part of the interpersonal environment, which influences people throughout life; and (4) self-initiated reconfiguration of the person-environment interactive patterns (Nursing Theory, 2016).

Application to practice change. The basis of using this theory is that by increasing health promotion screenings, this will improve a patient's overall well-being. The third assumption of the HPM is that health professionals influence patients throughout life, by interceding through an interpersonal environment. This statement is the foundation of this project because healthcare providers will improve a patient's well-being by increasing cancer screenings in the general population during wellness visits.

EBP Change Theory

Evidence-based practice (EBP) involves clinical decision making within an organization that contributes to improving a healthcare issue. EBP combines the latest scientific evidence with the latest patient or provider evidence. The evidence-based practice model used for this project is the Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) model (Appendix D). This model addresses the needs of healthcare professionals by using a process that includes three parts: a practice question, evidence, and translation. The first part is the practice question, which should include refining the question with the healthcare team. The second part is the evidence, which should include the search strategies and sources of up-to-date information regarding the topic. Lastly, the third part is the translation, which should include the creation of an action plan,

evaluation of outcomes, and dissemination of the results (Oregon Health & Science University, 2015). The purpose of the JHNEBP model is to incorporate the most relevant data and best practice guidelines for patient care (Johns Hopkins Medicine, 2017).

Application to practice change. The reasoning behind the use of the JHNEBP model for this project is that the emphasis of the model focuses on the organizational process. The first section introduces a clinical question, which in this project would be "How can providers incorporate evidence-based cancer screenings in a private primary care clinic?" Next evidence related to criteria for cancer screenings in primary care, are analyzed and documented for future implementation. The last section of the model includes translation, which is the actual implementation of the action plan and the evaluation of measurable outcomes.

Summary

Applications of theory into quality improvement projects offer multiple benefits to improve patient outcomes in clinical settings. Theory and evidence-based models establish a foundation for quality improvement projects to base options for change. Pender's HPM involves examining ways for patients to improve lifestyle behaviors that will, in turn, improve overall health. The JHNEBP model breaks down the healthcare issue in question and assesses each component in separate steps. Evidence-based practice models incorporate all aspects of healthcare as a problem-solving approach to areas requiring improvement.

Chapter Four: Pre-implementation Planning

Pre-implementation planning of a DNP project into a primary care practice involves many components. First, the clinical site must approve the DNP project at the practice. After approval, a site champion and other team members agree to assist in project development and implementation. Once there is an establishment of team members, the project details progress accordingly.

Project Purpose

The purpose of this DNP project was to integrate routine cancer screenings into standards of care in this primary care practice through a quality improvement project with the goal of increasing cancer screenings in patients. The clinical question will be "How can providers incorporate a routine process for evidence-based cancer screenings in a private primary care clinic?" This project will answer this clinical question by providing data that demonstrates the need for increasing cancer screenings in practice (Appendix E).

Project Management

Organizational readiness for change. [redacted] was ready as an organization for change in regards to screenings conducted there (Appendix F). The providers at this practice are knowledgeable individuals who currently conduct cancer screenings on each patient who meets criteria. However, cancer screening percentages at this practice were not as high as the staff would like. The providers and staff at this practice have been accepting of this DNP project and want to increase the number of cancer screenings completed in the practice. Each of the providers agreed to utilize the DNP tool for data collection during the implementation period, in hopes to increase the number of cancer screenings.

Inter-professional collaboration. There were several team members utilized for this DNP project. The site champion is also the office manager, which helped in many ways during the data collection process. The site champion worked with other team members during this process and monitored for changes during the project implementation (Appendix G). Other team members include providers, secretaries, nurses, and school faculty. The providers, nurses, and secretaries were aware of this DNP project and agreed with implementing this project during the semester. Implementation entailed the secretary giving the tool to the provider for patients needing routine physical examinations. The providers returned the completed tools to the secretary after seeing each eligible patient. The school faculty assisted in this project by communicating with suggestions, approving project details, and answering questions regarding the project.

Risk management assessment. The SWOT (Strengths, Weaknesses, Opportunities, and Threats) Analysis assesses the DNP project by recognizing possible changes needed for implementation. One major strength of [redacted] was that the practice is small, which allowed for easier communication with management and staff. Another advantage of conducting the project at a small practice was that monitoring results was simpler than having to go through a large system. A weakness of this practice was that the cancer screening rates are not as high as other facilities. Screening rates were not as high in this practice due to lack of resources needed to complete screenings in the clinic, not having the latest technology for screenings, and not all of the staff were trained to complete screenings. Therefore, the practice agreed to participate in this project, in hopes to increase cancer screenings during patient care. Opportunities for this practice include increasing cancer screenings during routine visits, increasing provider knowledge of cancer screenings, and increasing early detection of cancer by

using screening guidelines. Threats for this project include cancer screening guidelines changing policies during the implementation phase and providers not completing all screenings recommended on patients.

Organizational approval process. Based on the role performed at the practice, there was a selection of team members for this DNP project. Team leaders asked about current cancer screening guidelines and routine screenings in primary care. Team leaders agreed that the number of cancer screenings needed to increase, and that this area needs improvement. The providers agreed upon the screening tool utilized for data collection. The site champion conducted meetings for final approval of project implementation.

Information technology. Technology used for this project is Microsoft Office and Excel for data collection. These programs created tables and charts to present the data. In addition, the Electronic Health Record (EHR) utilized chart reviews at the practice. The EHR database screened data based on which demographics the project needs.

Cost Analysis of Materials Needed for Project

The success of a project corresponds to the professional budget created. The proposed budget lists the vital components for completing the project, and was only an estimate of the funds needed over the three-month period (Appendix H). The budget for this project was not extensive since many of the resources were in the clinic and conducted by staff during regular clinic hours. The largest expense for implementing this project was the supplies needed for printing the collection tools. The providers received a printed project tool with each patient during an annual physical examination, so this added up quickly. Training for medical staff was not an expense in this case, since the providers were already aware of current cancer screening guidelines. Incorporating these costs into the project budget provides a framework for the study.

Plans for Institutional Review Board Approval

Institutional Review Board (IRB) approval was not required for the implementation phase at [redacted]. East Carolina University (ECU) IRB approval was initiated by creating an E-Pirate account online and adding the plan of for the proposed project. The ECU staff approved the project prior to submission for board approval. IRB reviewed the project and deemed it as quality improvement (Appendix I).

Plan for Project Evaluation

Demographics. The demographic data that was collected from this project include the age and gender of patients. Along with these demographics, a patient's history was noted. This project documented and evaluated certain types of cancers as well. The DNP project tool collected the demographic data of the patients, including age and gender (Appendix J). All demographic data presents a mean, mode, and range.

Outcome measurement. The outcome of this DNP project was to increase cancer screenings in a primary care practice by incorporating a screening tool into routine care. [redacted] was averaging around 60-70% of completing cancer screenings on patients during visits. The providers and management agreed that this percentage needed to be increased, and that there needed to be a reminder in place for providers to screen patients according to the criteria patients meet.

Evaluation tool. The evaluation tool used to reach this outcome was the cancer screening tool created to use during visits. The cancer screening tool was a collaboration of the recommended cancer screenings from the CDC and the USPSTF. Guidelines were selected from these two organizations due to the practice currently using these guidelines for screenings. Familiarity made it simpler to discuss the screening tool with the providers. Microsoft Word

compiled the criteria for each cancer screening and placed the information in chart form. Each of the cancer screenings listed on the tool states the recommendations for providers to use during physical examinations, including age and frequency of screening. The tool was a reminder for providers to screen patients according to demographic data. The provider documented on each screening for how it pertains to the patient. Providers documented if the screening is scheduled, completed, or declined. The evaluation period calculated the data and the results.

***Data analysis*.** The evaluation tool assessed the total number of cancer screenings addressed (scheduled/completed/declined) during the three months of implementing the project. In addition, there was an evaluation of random charts to determine the percentages prior to implementing the cancer screening tool in the practice. Percentages of cancer screenings fell between sixty and eighty percent compliance on majority of cancer screenings. The pre-implementation data compared to the post-implementation data determines the project's outcome.

Data management. The printed data collection tools were in a folder at the practice site, locked in an office drawer, to protect patient identity. The chart review process was always secure due to only one person having access to the computer and records. The printed data was at [redacted] until the end of the project, after the spring semester. Once the project was complete, the data was destroyed.

Summary

The DNP project requires an extensive amount of time and effort to ensure completion in the appropriate timeframe. Several steps were required for the pre-implementation period, including ECU IRB approval, data collection tools, and the organization's readiness for change. The pre-implementation period was a detailed and complex phase, and must be completed prior

to presenting the project to the practice. Once staff members and faculty grant approval, the project can enter the implementation period.

Chapter Five: Implementation Process

For the implementation period to be successful, the project requires a great deal of prepping and planning. The implementation process included delivering the data collection tools to the practice, educating staff on the project, and collecting the tools after completion to determine the results.

Setting

The setting of this DNP project was at [redacted], which was a privately-owned primary care practice. The practice sees about one hundred patients a day from pediatrics to geriatrics. There are four providers at this facility and each provider sees a certain number of patients each day. Patient care visits incorporated the EBP change noted in this project.

Participants

Participants in this project were the providers at [redacted]. There are four providers at this clinic. One provider is a physician and is the owner of the practice. He has been practicing for 40+ years. The other three providers are physician assistants and have been practicing between 2-4 years. Inclusion criteria include providers of all genders, providers of all ages, and providers with a Master's Degree and higher. Exclusion criteria include providers outside of [redacted]. Providers were given education on the data collection tools prior to implementation. Education included demonstrating the documentation of the tool as well as giving the providers a number in case any questions or concerns came about during implementation.

Recruitment

The data for this project was from patients 18 years and older coming into the clinic for annual physical examinations. Patients did not need to sign a consent to be in this project, as it was deemed quality improvement and no identifiable data was collected. During patient care, providers collected the data related to cancer screenings and made note of it on the project tool. If the patient fit the criteria for a cancer screening, then the patient had the screening completed in office, referred out of office for the screening, or chose to decline the screening.

Implementation Process

The implementation of this project started by creating a data collection tool. The tool lists the top six cancers (breast, lung, colon, skin, cervical, and prostate) and the appropriate, evidence-based screenings that accompany each cancer (Appendix J). These six cancers are the most commonly diagnosed cancers in the United States (National Cancer Institute, 2017). Fortunately, these cancers have evidence-based screenings to assist the provider with diagnostic measures. The data collection tool lists the criteria for each cancer screening to allow easier access for the provider to review if needed. The criteria utilized for the tool was a collection of guidelines for the CDC and the USPSTF.

Each provider received a data collection tool during a patient's annual physical examination. Education on the collection tool was given to the providers before the implementation phase. Education on the tool included going over each cancer screening and the age and frequency the CDC and USPSTF recommended. In addition, education included a demonstration on how to complete the tool based on an example of a patient. Providers understood to collect all data tools and store them until the end of the implementation phase. Biweekly meetings showed no concerns or questions regarding the tool, and that patients were being screened appropriately according to the need for each screening.

The provider addressed each screening that the patient needed based on demographics. In the first column, the provider either marked that the screening was addressed or not applicable to the patient. If the screening was applicable to the patient, then the next column was addressed. The provider checked to see if the screening will be completed in the office, be referred to another office, or if the patient declines. If the screening was not applicable to the patient, then nothing else is required for the form. The staff collected the tool and stored all of the tools until the end of the implementation phase.

Plan Variation

Variations during project implementation included adding dates to the project tool, adding the patient's age to the project tool, and adding a space for gender to the project tool. These variations were found through the PDSA cycles that were completed during implementation. The first PDSA cycle found that providers would like a date to be added to the tool so that it would be easier to access information and to allow for better organization. The reasoning behind adding dates to the tool was that it assists with documentation of visits, which allows for easier access of patient's charts for the chart reviews. Providers appreciated the data collection tool and found it simple to follow. Providers began to document the date at the top of the tool.

At the next PDSA cycle, providers found it would be more efficient to have the age and gender of patients on the tool to document why certain cancer screenings were recommended. Creating a space for the patient's age and gender also allowed for an easier analysis of data during the evaluation phase. Providers began to list the patient's age and gender to determine whether the documentation on the tool is appropriate. These variations were necessary for the project's development and support the evaluation phase of the project.

The following PDSA cycles did not involve any changes to the data collection tool, but rather provided an environment to discuss questions or concerns with the data collection tool. Providers did not have any other suggestions for the tool itself, but mentioned how it would be beneficial to have the tool incorporated into the EHR system. During one of the PDSA cycles, the clinic manager reviewed the data collection tool and wanted to place it as a reminder in the EHR system. Unfortunately, there was not enough time during the implementation phase to have this completed, but the clinic manager is working with the EHR system to have this in place within the next year.

Summary

[redacted] is a rural, privately-owned practice that agreed to implementing this DNP project for three months. The providers were educated on the data collection tools and the process of the DNP project. The implementation of the project included collecting cancer screening data from patients 18 and older during annual physical examinations. PDSA cycles were used during the implementation phase to see what variations needed to be made to the data collection tool. Variations to the project included editing the data collection tool to include the date of examination, the patient's age, and the patient's gender. Providers and other management staff of the practice appreciated the tool and took the time to discuss possible changes to the EHR system in the future, which would allow to tool to be utilized in routine patient care.

Chapter Six: Evaluation of the Practice Change Initiative

The evaluation of a project determines what outcomes are produced by the implementation phase. The implementation phase of this project included delivering data collection tools to providers to assist in proper screening of cancer during annual physical examinations. Evaluation began with data collection from small chart audits and collection tools. A comparison of data from before the collection tool utilization and after the collection tool utilization showed an increase of 25% in the number of cancer screenings completed at this primary care practice.

Participant Demographics

Participants in this project were the providers at [redacted]. There are four providers at this clinic. One provider is a physician and is the owner of the practice. He has been practicing for 40+ years. The other three providers are physician assistants and have been practicing between 2-4 years. Each of the providers had education on the purpose of the project and the data collection tool format. One hundred data collection tools were completed over the three-month implementation phase. Participants understood the importance of increasing cancer screening compliance in practice.

Intended Outcome

The outcome of a project can vary between different topics and populations. A description of a project outcome includes the evaluation of the project. Some examples include 1) the project was successful by increasing cancer screening in practice, 2) the project was beneficial to the patient population, 3) the project was undetermined due to time constraints, etc. The intended outcome of this project was to increase cancer screenings in a primary care clinic. The focal point of this project was to see if establishing a reminder for providers to screen

patients for cancer would increase the amount of screenings the clinic performed. As a result, the screenings did in fact increase by 25%, and the providers stated how beneficial this data collection tool was during the three months of utilization. The simplicity of the data collection tool assisted in the project's success by being a guide in routine patient care, instead of additional charting the providers had to complete.

Findings

For the evaluation of this project, a chart review compared the pre-project percentages of cancer screenings completed during annual physical examinations to the post-project percentages of cancer screenings. Along with pre-project and post-project percentages, there was a review of the data collection tools used during implementation. There were one hundred data collection tools utilized during implementation, with one hundred percent compliance over the three-month implementation phase. Cervical cancer, prostate cancer, skin cancer screenings were completed in office. These screenings included pap smears for cervical cancer, PSA testing for prostate cancer, and physical examination of the skin for skin cancer. All one hundred of the patients screened received a skin cancer screening. There were 29 pap smears and 25 PSA tests completed in office during implementation.

If the patient qualified for breast, colon, or lung cancer screenings, then referrals were given for those. Referrals for these screenings included mammography for breast cancer, colonoscopy for colon cancer, and low-dose CT for lung cancer. Referrals given included 44 mammograms, 21 colonoscopies, and 2 low-dose CT scans. Prior to the implementation of this project, [redacted] was averaging around 70%-75% completion on all cancer screenings in office. A calculation of this number was found by averaging the compliance of each of the six cancers listed on the data collection tool. According to the data collection tool

results, compliance of the tool use was at 100%, meaning all cancer screenings were completed in office or referred to a specialist. There were no patients who declined the cancer screenings. There was at least a 25% increase in the number of cancer screenings completed in clinic during the implementation of this data collection tool.

The evaluation phase showed some variations to the project data collection process. The practice was open to suggestions for how to continue with using a specific cancer screening tool during annual physical examinations. The simplicity of the data collection tool proved to be beneficial during the evaluation phase. In addition, this allowed providers to see where the gaps were in patient care during routine visits. The data collection tool served as a reminder to providers to screen patients according to specific demographic data. Challenges during the project included not having the tool placed into the EHR system, which may have made it easier for providers to check off screenings after completion, and cancer screening guidelines changing during the middle of the project. There were no obvious mistakes made during the project, but this could include making adjustments to the data collection tool and changing some of the information that needed to be included on the form.

Summary

[redacted] agreed to host this DNP project in hopes to increase cancer screening rates in practice. The participants in this project were the providers at this primary care practice. A chart review from pre-project and post-project data showed an increase of 25% in the number of cancer screenings completed during the three months of implementation. Cancer screenings completed in-office included cervical, prostate, and skin cancer. Cancer screening referrals included breast, colon, and lung cancer. One hundred percent of the cancer screenings were utilized appropriately during the implementation phase. The

practice was satisfied with these results and mentioned incorporating this tool into routine patient care, hopefully through the EHR system. The providers showed great interest in the project and were pleased with the increase in the number of cancer screenings that were done during annual physical examinations.

Chapter Seven: Implications for Nursing Practice

Implications for nursing practice contain eight DNP essentials that are the core for patient care. These DNP essentials discuss concepts that relate to patient care in the workplace and are vital for successful patient outcomes. Nursing practice is evolving and branching out into the public to offer more services to patients and family members. With a DNP degree, advanced practice nurses have an increase in responsibility and accountability for a patient population.

Practice Implications

DNP essentials are competencies that provide a foundation for all advanced nursing practice roles. There are eight essentials for completion of a DNP degree. Regardless of which specialty an advanced practicing nurse will work in, all DNP essentials are required to successfully complete the DNP degree. Some of the essentials discuss leadership skills and address competencies related to administration. Other essentials focus more on the clinical aspects of patient care and the interprofessional collaboration that entails an advanced practicing nurse.

Essential I: Scientific underpinnings for practice. The first essential discusses the principles of the life process and the pattern of human behavior. This essential describes how an environment effects the health of a human. Research utilized for this project was based on the increase in the number of cancer cases in the United States and how increasing cancer screenings decrease mortality and morbidity rates, as well as decreasing costs during cancer care. The family practice that accepted the DNP project wanted cancer screenings in office to increase. Creating a screening reminder or screening tool in family practices can increase the number of cancer screenings providers complete during patient annual examinations.

Essential II: Organization and systems leadership for quality improvement and systems thinking. Leadership plays an important role in the delivery and outcomes of patient care. This essential discusses the need for communication in practice, the accountability for patient safety, cost-effective practice methods, and sensitivity to cultural needs. During this project, one quality improvement issue that surfaced was not having an up-to-date EHR system that allowed screening reminders to be readily available to providers. Another quality improvement issue lack of resources in a rural setting. This made it difficult for referrals and treatment options that patients may need if at risk or diagnosed with cancer. Gaps in patient care for cancer screening included varying cancer screening guidelines and lack of resources within the family practice. One cost-effective initiative is to include this cancer screening tool created for this project into routine patient care.

Essential III: Clinical scholarship and analytical methods for EBP. Application of patient-care guidelines improves patient safety as well as improving the practice environment. This essential describes the use of technology for data collection, data analysis, recognizing gaps in patient care, and prediction of outcomes. Evidence-based practice guidelines for cancer screenings discuss which cancers are more likely to occur in a given patient population. These guidelines were compiled to create a screening tool to collect and evaluate the number of cancer screenings completed in the practice. Research collected on this topic provided guidance with creating an appropriate data collection tool that would be used to improve the cancer screening rates in that family practice.

Essential IV: Information systems/technology and patient care technology for the improvement and transformation of healthcare. Technology is highly important when dealing with healthcare and patient safety. Essential IV mentions designing and evaluating programs to

determine patient outcomes, evaluating health care information systems, and demonstrating technical skills to extract data from patient databases. Technology used in this project included access to EHR system, Microsoft word for documenting patient outcomes, and printing off patient data collection tools for staff. Improvements in technology would be to update EHR system to allow for reminders and templates to be accessible to providers during patient visits.

Essential V: Healthcare policy for advocacy in healthcare. Healthcare policies are always changing and new policies are being incorporated into practice each day. This essential discusses how to critically analyze a healthcare policy and how to apply it to practice. It is important to note the application of each policy, whether at international, federal, state, or local level. Policy recommendations that result from this project include advocating for cancer screenings to become mandatory during annual physical examinations in all practices nationally. Many patients in this rural area do not have health insurance and are not able to afford cancer screenings if needed. Establishing "free" or community care clinics in this area would allow more patients to receive the screening, diagnosis, education and treatment needed for cancer prevention or diagnosis.

Essential VI: Interprofessional collaboration for improving patient and population health outcomes. Interprofessional collaboration is present in every aspect of healthcare. A team of providers, nurses, and other staff help to ensure positive patient outcomes by working together to form a care plan. This plan is started during the patient's first visit and should be altered to fit the patient's specific healthcare needs. Essential VI describes the leadership of interprofessional teams to analyze practice and organizational issues. Also, this essential mentions communication and collaboration skills for healthcare delivery. Suggestions on improving interprofessional collaboration include setting up meetings within practices to talk about issues or concerns each

staff member may have, and establishing a safe environment where the staff can relay patient information to the providers to improve patient quality of care.

Essential VII: Clinical prevention and population health for improving the nation's health. Public health is a crucial component in healthcare. Populations vary among region and it is important to know which cancers have higher ratings when contemplating screening needs. This essential demonstrates how to analyze epidemiological and biostatistical data for a population's health, and how to address health promotion and disease prevention. During this project, patients could decline a cancer screening, even if it was recommended due to demographics. Even though some patients refuse cancer screenings for various reasons, no patients during the project implementation phase refused any screenings. Many patients will receive a cancer screening if a provider emphasizes the need for the screening. This is a huge component of health promotion and demonstrates how to be patient advocates to diagnosis cancer at earlier stages of the disease process.

Essential VIII: Advanced nursing practice. Essential VIII is one of the most vital essentials to the advanced practicing nurse because it describes role in which patients will be cared for in practice. This essential discusses conducting a comprehensive assessment on patients, developing relationships with patients and family members, having an advanced clinical judgment in patient care, and applying analytical skills in practice. Due to the increasing statistics of cancer, there is a great need for advanced practice nurses. The family practice that allowed the DNP project to take place has never hired a nurse practitioner at the facility. The manager of this practice was surprised of the outcome of the project and requested to use the tool in the future. The project helped to break barriers between what the public assumes nurse

practitioners are capable of achieving, and builds a bridge to allow future nurse practitioners to practice in that facility.

Summary

The DNP essentials assist in preparing the advanced practice nurse for the workplace. Upon completion of these eight essentials, the advanced practice nurse can assess and evaluate patients at an independent level of nursing practice. These eight essentials demonstrate skills ranging from leadership, evaluation, technological, and interprofessional, to name a few. In clinical practice, these essentials provide guidance for the advanced practice nurse during assessment and evaluation of a patient or situation. Critical thinking and clinical judgement play a significant role in patient safety, since an advanced practice nurse is responsible for a particular patient population. DNP essentials deliver core elements that lay the foundation for quality patient care and positive patient outcomes.

Chapter Eight: Final Conclusions

The purpose of this project was to increase the amount of cancer screenings in a primary care practice by incorporating a cancer screening process using a unique tool in routine care. [redacted] wanted to increase the percentage of cancer screenings completed in office and agreed to host this project. During implementation of this project, providers used a data collection tool, which was a combination of the recommended cancer screening guidelines, to screen patients during annual physical examinations. An evaluation of the implementation phase showed an increase in cancer screening evaluation after project implementation.

Significance of Findings

The project site had a 25% increase in the amount of cancer screenings completed in this clinic while using the cancer screening tool provided. Though this percentage was only over a three-month span at the clinic, it was still arguably an impressive number. This percentage does not individualize each cancer screening separately, but gives an estimation of how many cancer screenings can increase overall if there is a reminder given to providers to screen patients according to demographics.

Project Strength and Limitations

One of the largest strengths of this project was the success of the number of cancer screenings completed. The providers at the clinic were open and accepting of the data collection tool to use in practice, and were willing to use it on all annual physicals during a three-month timeframe. The providers were in agreement with wanting to increase cancer screenings in practice, so this was a significant boost for project success. Another strength was that the data collection tool was easy to use as well as easy to collect data from, so providers did not have

questions or concerns regarding the tool during implementation. There were a few limitations to the project and to the evaluation phase. First limitation involved the difficulty to track referrals for cancer screenings if the screening was not performed in the clinic. Another limitation noted at the start of the project were the ever-changing guidelines to cancer screenings. The CDC and USPSTF guidelines were similar, but had varying ages and frequency of when the screening should be completed. Lastly, there was a limitation on how to remind providers to screen patients for cancer. The EHR system is older and did not allow for installation of templates or reminders in the EHR for patient visits.

Project Benefits

Project benefits include being a resource for primary care practices in the surrounding areas, showing the importance of establishing a reminder for providers in primary care, and increasing early detection can decrease cancer mortality and morbidity rates. If [redacted] incorporates this data collection tool into routine care visits for patients, this can potentially be utilized by other primary care practices as well. Providers appreciated the reminder the data collection tool gave when having patients come in for annual physicals. This practice mentioned placing the cancer screening guidelines into a reminder template so all patients who fit the criteria are screened appropriately. Also, as stated before, increasing early detection of cancers through screening protocols can decrease cancer mortality and morbidity rates.

Recommendations for Practice

Practice recommendations are to incorporate this data collection tool into routine patient care visits in hopes to decrease cancer rates. [redacted] are working on a template to incorporate the screening reminders in patient's charts for annual physical examinations. Plans for dissemination include presenting the data results with the site providers

and staff, presenting the poster to the College of Nursing for the DNP faculty, and submitting the project and findings to the American Journal of Nursing for providers, nurses, and other medical personnel.

Final Summary

Cancer screenings show a reduction in mortality and morbidity rates by early detection and prevention procedures. By increasing provider knowledge and detecting cancer at earlier stages, mortality and morbidity rates can decrease. The purpose of this DNP project was to integrate routine cancer screenings into standards of care in this primary care practice through a quality improvement project with the goal of increasing cancer screenings in patients. During the three months of implementation, providers used a data collection tool of the recommended cancer screenings for patients coming in for annual physicals. Findings showed a 25% increase in post-project cancer screening compliance compared to the pre-project cancer screening compliance. By creating a reminder for providers to screen patients for cancer, not only educates the providers on who and when to screen, but also creates accountability for providers for the safety and well-being of patients. In conclusion, having cancer screening reminders for providers increases the chance of patients receiving the recommended screenings.

References

Ahnen, D., & Patel, S. (2018). Colorectal cancer in the young. *Current Gastroenterology Reports, 20,* 15. doi: 10.1007/s11894-018-0618-9

Anonson, J., Holtslander, L., Maree, J., & Ogunkorode, A. (2017). Promoting early detection of breast cancer and care strategies for Nigeria. *African Journal of Reproductive Health, 21,* 18-25. Retrieved from https://search-proquest-com.jproxy.lib.ecu.edu/docview/1953853065/fulltext/66C56784CB6D47A8PQ/1?accountid=10639

Barry, M. (2018). Screening for prostate cancer: Is the third trial the charm? *JAMA, 319,* 868-869. doi:10.1001/jama.2018.0153

Bosch, J., Doornen, L., Haes, H., Smets, E., Tollenaar, M., & Visser, L. (2017). Are psychophysiological arousal and self-reported emotional stress during an oncological consultation related to memory of medical information? An experimental study. *Stress: The International Journal on the Biology of Stress, 20,* 86-94. doi: 10.1080/10253890.2017

Centers for Disease Control and Prevention. (2017). *Breast Cancer.* Retrieved from https://www.cdc.gov/cancer/breast/basic_info/screening.htm

Centers for Disease Control and Prevention. (2017). *Colorectal Cancer.* Retrieved from https://www.cdc.gov/cancer/colorectal/basic_info/screening/tests.htm

Centers for Disease Control and Prevention. (2016). *Gynecologic Cancers.* Retrieved from https://www.cdc.gov/cancer/cervical/basic_info/screening.htm

Centers for Disease Control and Prevention. (2018). *Lung Cancer.* Retrieved from https://www.cdc.gov/cancer/lung/basic_info/screening.htm

Centers for Disease Control and Prevention. (2017). *Prostate Cancer.* Retrieved from https://www.cdc.gov/cancer/prostate/prostate-cancer-screening-fact-sheet.htm

Centers for Disease Control and Prevention. (2016). *Skin Cancer*. Retrieved from https://www.cdc.gov/cancer/skin/basic_info/screening.htm

Cheung, D., Chung, W., Jung, D., Kim, J., Kim, S., Lee, J., & Park, S. (2018). Early detection is important to reduce the economic burden of gastric cancer. *Journal of Gastric Cancer, 18,* 82-89. doi: 10.5230/jgc.2018.18.e7

Chien, J., & Poole, E. (2017). Ovarian cancer prevention, screening, and early detection: Report from the 11th biennial ovarian cancer research symposium. *International Journal of Gynecological Cancer, 27,* 20-22. doi: 10.1097/IGC.0000000000001118

Crothers, K., Elmore, J., Frederick, P., Kross, E., Mann, B., Romine, P., … Triplette, M. (2018). An assessment of primary care and pulmonary provider perspectives on lung cancer screening. *Annuals of the American Thoracic Society, 15,* 69-75. doi: 10.1513/AnnalsATS.201705-392OC

Epling, J., Fox, C., Mader, E., Morley, C., Noronha, G., Norton, A., … Wisniewski, A. (2016). A practice facilitation and academic detailing intervention can improve cancer screening rates in primary care safety net clinics. *Journal of the American Board of Family Medicine, 29,* 533-542. doi: 10.3122/jabfm.2016.05.160109

Fairley, T., Lunsford, N., Reynolds, J., Sapsis, K., Smither, B., & Wilburn, B. (2018). Young women's perceptions regarding communication with healthcare providers about breast cancer, risk, and prevention. *Journal of Women's Health, 27,* 162-170. doi: 10.1089/jwh.2016.6140

Hawes, S. (2018). HPV vaccination: Increase uptake now to reduce cancer. *American Journal of Public Health, 108,* 23-24. doi: 10.2105/AJPH.2017.304184

Heydari A., & Khorashadizadeh F. (2014). Pender's health promotion model in medical research. *Journal of Pakistan Medical Association, 64,* 1067-1074. Retrieved from http://jpma.org.pk/full_article_text.php?article_id=6937

Johns Hopkins Medicine. (2017). *Center for Evidence-Based Practice.* Retrieved from https://www.hopkinsmedicine.org/evidence-based-practice/ijhn_2017_ebp.html

Loerze, V., Turnage, D., & Woodmansee, R. (2018). Nurse practitioner student knowledge and attitudes toward skin cancer assessments. *Journal of the Dermatology Nurses' Association, 10,* 115-119. doi: 10.1097/JDN.0000000000000385

National Cancer Institute. (2017). *Cancer Statistics*. Retrieved from https://www.cancer.gov/about-cancer/understanding/statistics

Nursing Theory. (2016). *Health Promotion Model.* Retrieved from http://www.nursing-theory.org/theories-and-models/pender-health-promotion-model.php

Oregon Health & Science University. (2015). *Evidence Based Practice Toolkit for Nursing.* Retrieved from http://libguides.ohsu.edu/ebptoolkit

PDQ Screening and Prevention Editorial Board. (2018). *Breast Cancer Prevention (PDQ): Health Professional Version*. Retrieved from https://www-ncbi-nlm-nih-gov.jproxy.lib.ecu.edu/pubmed/26389323

Schabath, M. (2018). Risk models to select high risk candidates for lung cancer screening. *Annals of Translational Medicine, 6,* 65. doi: 10.21037/atm.2018.01.12

Wheatley, B. (2018). Improving dermatological screening in primary care. *The Nurse Practitioner, 43,* 19-24. doi: 10.1097/01.NPR.0000531072.96311.44

Appendix A

Literature Search Strategy Log

Student: Casey Lowe	**Course: 8269**	**Faculty Lead: Dr. King**	**Date: 4/11/2018**	**Project: Improving Cancer Screenings in Clinical Practice**
Database	**Key Word Searches**	**Limits**	**# of Citations Found / Kept**	**Rationale for Inclusion / Exclusion (include rationale for excluding articles as well as for inclusion)**
PUBMED	Cancer screenings AND early detection	10 year period	50069/**6**	Kept articles that included cancer screenings and early detection importance. Excluded cancer treatments and cancer deaths.
PUBMED	Cancer screenings AND provider knowledge	10 year period	222/**6**	Kept articles that included provider education on cancer screenings. Excluded general provider education in primary care.
PUBMED	Importance AND theoretical framework	10 year period	1675/**2**	Kept articles that included how theory is a vital component of quality improvement projects. Excluded articles related to theory definitions.
PUBMED	Cancer costs AND economic burden	10 year period	2805/**2**	Kept articles that included direct costs of cancer care, cancer treatments, and other costs. Excluded articles that were inconclusive and conducted in other countries.

Appendix B

Evidence Matrix

Student: **Casey Lowe**	**Course:** **8269**	**Faculty Lead:** **Dr. King**	**Date:** **4/11/2018**	**Project:** **Improving Cancer Screenings in Clinical Practice**
Article (APA Citation)	**Level of Evidence (I to VII)**	**Data/Evidence Findings**	**Conclusion**	**Use of Evidence in EBP Project Plan (Include your evaluation, strengths/limitations, and relevance)**
Ahnen, D., & Patel, S. (2018). Colorectal cancer in the young. *Current Gastroenterology Reports, 20,* 15. doi: 10.1007/s11894-018-0618-9	Level IV	Early-onset colorectal cancer patients have different clinical, pathologic, and molecular presentations than those patients with colorectal cancer diagnosed at a later age.	Education is highly important for both the providers and patients to raise awareness about early-onset colorectal cancer in the younger population.	Include colorectal cancer screening criteria on data collection tool for providers.
Anonson, J., Holtslander, L., Maree, J., & Ogunkorode, A. (2017). Promoting early detection of breast cancer and care strategies for Nigeria. *African Journal of Reproductive Health, 21,* 18-25. Retrieved from https://search-proquest-com.jproxy.lib.ecu.edu/docview/1953853065/fulltext/66C56784CB6D47A8PQ/1?accountid=10639	Level VI	The main factors that contribute to late breast cancer diagnosis are lack of awareness, misconceptions about breast cancer causes, and treatment outcomes.	Implementation of breast cancer guidelines prevent late diagnosis of breast cancer in patients.	Include breast cancer screening criteria on the data collection tool for providers.

Barry, M. (2018). Screening for prostate cancer: Is the third trial the charm? *JAMA, 319*, 868-869. doi:10.1001/jama.2018.0153	Level IV	Prostate-specific antigen (PSA) screening can decrease mortality but can create a risk of harm from overdetection and overtreatment.	Male patients ages 50 to 69 years should be offered a single prostate-specific antigen test.	Include prostate cancer screening criteria on the data collection tool for providers.
Bosch, J., Doornen, L., Haes, H., Smets, E., Tollenaar, M., & Visser, L. (2017). Are psychophysiological arousal and self-reported emotional stress during an oncological consultation related to memory of medical information? An experimental study. *Stress: The International Journal on the Biology of Stress, 20*, 86-94. doi: 10.1080/10253890.2017	Level IV	Emotional stress causes patients to forget 20–80% of information provided during medical consultations regarding cancer diagnoses.	There is a high association between stress levels and memory during medical visits.	Educate patients on the importance of cancer screenings and ensure that this is just a screening, not a diagnosis.
Cheung, D., Chung, W., Jung, D., Kim, J., Kim, S., Lee, J., & Park, S. (2018). Early detection is important to reduce the economic burden of gastric cancer. *Journal of Gastric Cancer, 18*, 82-89. doi: 10.5230/jgc.2018.18.e7	Level II	First-year cancer costs increased from stages I to IV. The cancer costs of initial treatment versus post-initial treatment revealed lower costs in patients with stage I cancer.	The cost of cancer in healthcare increases significantly as cancer stages increase.	Utilize cancer screening guidelines to diagnosis cancer earlier and possibly prevent high healthcare costs.
Chien, J., & Poole, E. (2017). Ovarian cancer prevention, screening, and early detection: Report from the 11th biennial ovarian cancer research symposium. *International Journal of Gynecological Cancer, 27*, 20-22. doi: 10.1097/IGC.0000000000001118	Level III	Ovarian cancer prevention, screening, and early detection provide quality of care to patients.	Though there are no screenings for ovarian cancer, early detection is key in patients with ovarian cancer due to high mortality rates.	Focus on the importance of cancer screening guidelines and the importance of early detection.
Crothers, K., Elmore, J.,	Level II	Providers are	Common	Establish a

Frederick, P., Kross, E., Mann, B., Romine, P., … Triplette, M. (2018). An assessment of primary care and pulmonary provider perspectives on lung cancer screening. *Annuals of the American Thoracic Society, 15,* 69-75. doi: 10.1513/AnnalsATS.201705-392OC		missing key components of cancer screenings due to inadequate time (36%), inadequate staffing (36%), and patients having too many other illnesses to address screening (38%).	barriers to cancer screening include a lack of time or resources to address the screening in clinical practice. All of these barriers can be addressed to optimize screening implementation.	reminder for the provider to address cancer screenings with patients who meet the criteria.
Epling, J., Fox, C., Mader, E., Morley, C., Noronha, G., Norton, A., … Wisniewski, A. (2016). A practice facilitation and academic detailing intervention can improve cancer screening rates in primary care safety net clinics. *Journal of the American Board of Family Medicine, 29,* 533-542. doi: 10.3122/jabfm.2016.05.160109	Level I	Breast cancer screening rates increased by 13% and colorectal cancer screening rates increased by 5.6%.	By incorporating practice facilitation and academic detailing into clinical practice, this can improve cancer screening rates in private practices.	Increase provider knowledge and awareness of cancer screenings for patients based on history and demographics.
Fairley, T., Lunsford, N., Reynolds, J., Sapsis, K., Smither, B., & Wilburn, B. (2018). Young women's perceptions regarding communication with healthcare providers about breast cancer, risk, and prevention. *Journal of Women's Health, 27,* 162-170. doi: 10.1089/jwh.2016.6140	Level IV	Providers are missing opportunities to start conversations with women regarding breast cancer. Enhancing patient-provider communication and increasing knowledge about screening is essential.	Providers should obtain accurate and timely information about breast cancer risks, family history, and health behaviors.	Include breast cancer screening criteria on the data collection tool for providers.
Hawes, S. (2018). HPV vaccination: Increase uptake now to reduce cancer.	Level III	The importance of the HPV vaccine is to decrease the	The HPV vaccine should be utilized by	Include cervical cancer screening criteria on the

American Journal of Public Health, 108, 23-24. doi: 10.2105/AJPH.2017.304184		chances of developing certain strands of cancer.	providers for all young patients to prevent harmful effects of HPV.	data collection tool for providers.
Heydari A., & Khorashadizadeh F. (2014). Pender's health promotion model in medical research. *Journal of Pakistan Medical Association, 64,* 1067-1074. Retrieved from http://jpma.org.pk/full_article_text.php?article_id=6937	Level I	Pender's Health Promotion Model focuses on improving health promotion behaviors, identifying quality of life, and predicting stages of change.	Improving health by incorporating the health promotion model into practice, allows for better quality of life at different stages of development.	Pender's Health Promotion Model will be utilized for this project as the theoretical framework.
Loerze, V., Turnage, D., & Woodmansee, R. (2018). Nurse practitioner student knowledge and attitudes toward skin cancer assessments. *Journal of the Dermatology Nurses' Association, 10,* 115-119. doi: 10.1097/JDN.0000000000000385	Level V	Nurse practitioner students discussed their knowledge, attitudes, and confidence in identifying different skin lesions to diagnosis cancer.	Early detection and treatment of skin cancer is related to the patient's outcome of the disease.	Include skin cancer screening criteria on the data collection tool for providers.
Schabath, M. (2018). Risk models to select high risk candidates for lung cancer screening. *Annals of Translational Medicine, 6,* 65. doi: 10.21037/atm.2018.01.12	Level IV	The 5-year survival for lung cancer patients has not improved, mainly due to lack of early detection.	Improvements of lung cancer risk assessment and early detection is key in improving patient outcomes.	Include lung cancer screening criteria on the data collection tool for providers.
Wheatley, B. (2018). Improving dermatological screening in primary care. *The Nurse Practitioner, 43,* 19-24. doi: 10.1097/01.NPR.0000531072.96311.44	Level II	Providers do not conduct adequate skin assessments, due to conflicting guidelines and time constraints.	Providers should screen patients for skin cancer because skin cancer is treatable and curable.	Include skin cancer screening criteria on the data collection tool for providers.

Appendix C

Health Promotion Model

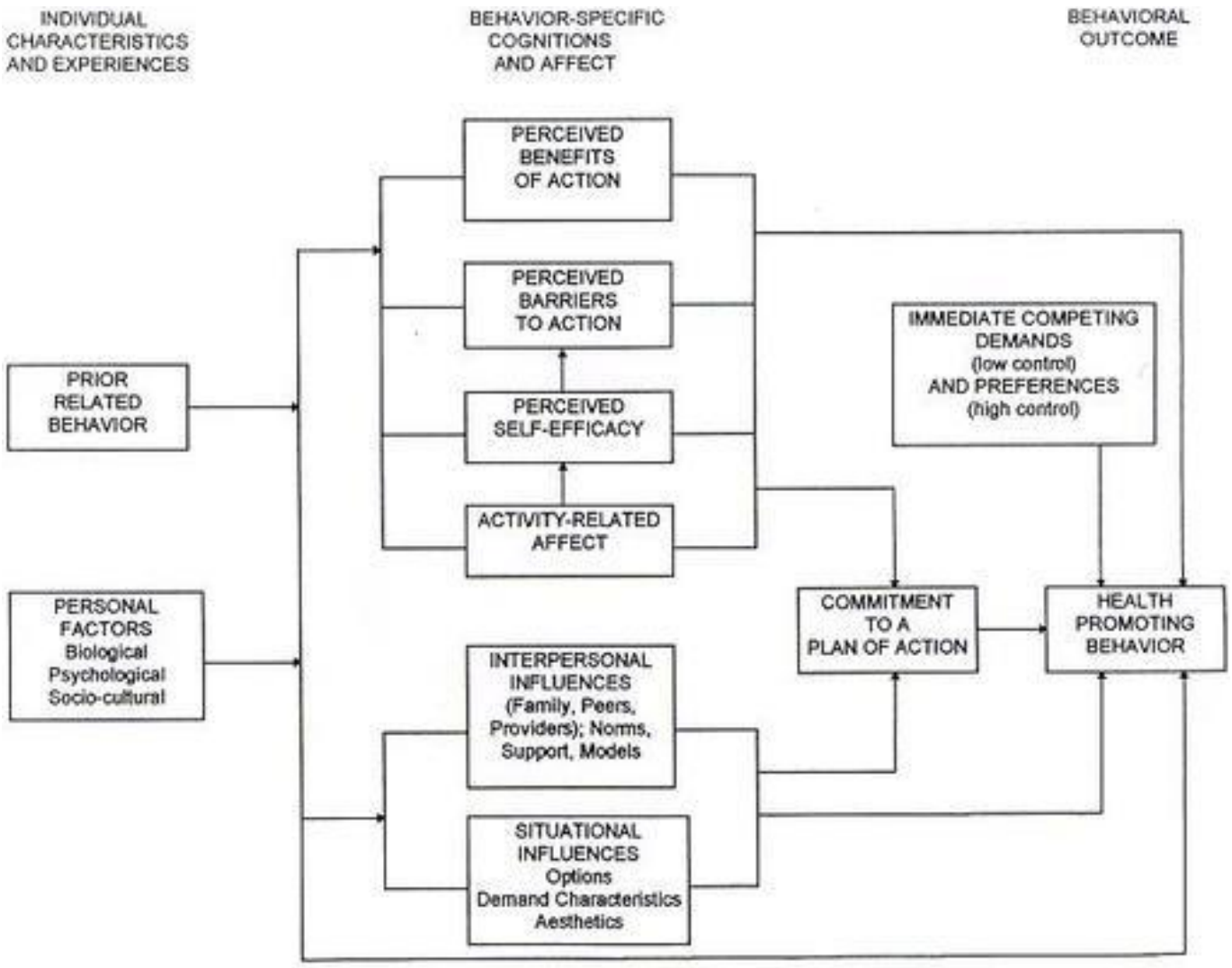

Figure 1. Nola Pender's health promotion model. Reprinted from *Theoretical Foundations of Nursing*, by Gonzalo, A., 2011, Retrieved from http://nursingtheories.weebly.com/nola-pender.html Copyright [2011] by Gonzalo, A. Reprinted with permission.

Appendix D

Johns Hopkins Nursing Evidence-Based Practice Model

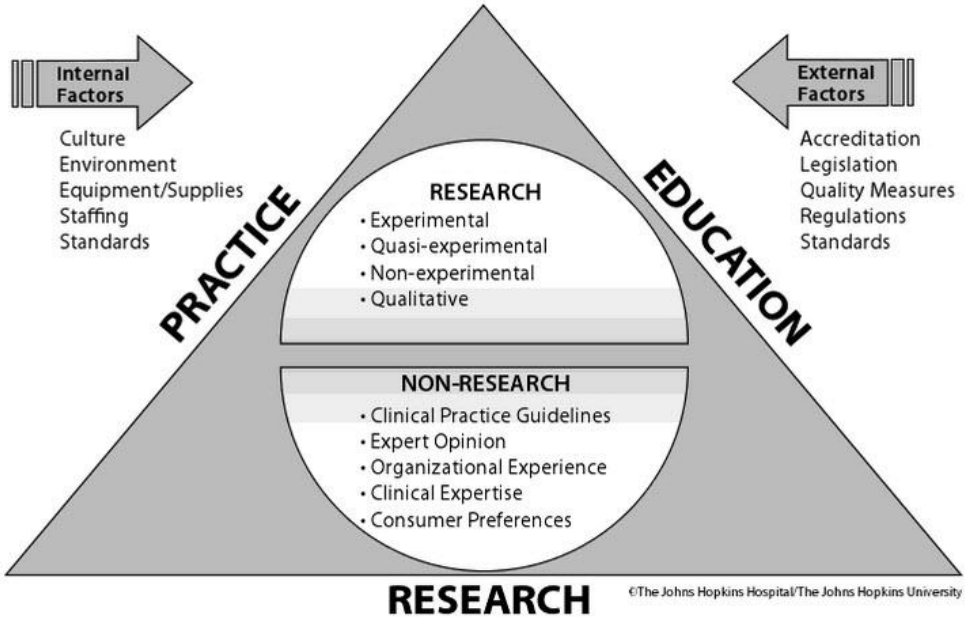

Figure 3.1 The Johns Hopkins Nursing Evidence-Based Practice Model

Figure 2. John Hopkins nursing evidence-based practice model. Reprinted from *Evidence Based Practice Toolkit for Nursing*, by Oregon Health & Science University, 2015, Retrieved from http://libguides.ohsu.edu/ebptoolkit Copyright [2015] by Oregon Health & Science University. Reprinted with permission.

Appendix H

Financial Analysis Budget

Resources Needed for Budget	**Projected Cost for Resources**
Ink	$100
Paper	$100
Miscellaneous	$50
Total	**$250**

Appendix J

DNP QI Cancer Screening Project Tool

Given to providers for **ALL patients over 18 years of age**

All screenings should be either Addressed (A) or Not Applicable (N/A)
If Addressed, then screening should be either Scheduled (S) or Declined (D)

Preventative Screening	**Criteria for Screening**	**Screening** **Addressed (A) or Not Applicable (N/A)**	**Screening** **Scheduled (S) or Declined (D)**
Breast Cancer Screening: *Mammogram*	Women 50-74 years of age; ***every other year*** Those with risk factors can begin as early as 40		
Cervical Cancer Screening: *Pap Smear*	Women 21-65 years of age; ***every 3 years***		
Colorectal Cancer Screening: *Colonoscopy*	Patients 50-75 years of age; ***every 10 years*** unless abnormalities are found Those with risk factors can begin earlier		
Lung Cancer Screening: *Low Dose CT Scan*	Patients 55-80 years of age, **AND** a tobacco hx of 30-pack-year or more, **AND** current smoker or quit within the last 15 years		
Prostate Cancer Screening: *Digital Prostate Exam and/or PSA testing*	Men 50 years and older; ***annually***		
Skin Cancer Screening: *Physical Examination of Skin*	Patients 18 years and older; ***annually***		