Breast Cancer Screening Protocol for Health Care Providers

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Breast Cancer is the most commonly diagnosed cancer in women regardless of age or ethnicity, and the second most common cause of cancer death (American Cancer Society [ACS], 2015). It is a worldwide problem affecting millions of people each year. According to the Centers for Disease Control and Prevention [CDC] (2015), breast cancer rates vary by ethnicity. Early detection has been identified as crucial to survival. Nationally, when breast cancer is diagnosed in the early stages, the five-year survival rating is above 99% (American Cancer Society, 2015). Anderson and Hoskins (2012) point that despite the decrease of annual death rates from breast cancer since 1991, significant racial and ethnic disparities exist in breast cancer morbidity and mortality.

According to American Cancer Society [ACS] (2015), advances in breast cancer treatment and screening initiatives have afforded significant declines in breast cancer mortality over recent years. However, breast cancer continues to be a national priority as every year over 200,000 women will be diagnosed with cancer, and approximately 40,000 will die (American Cancer Society, 2015). Unfortunately, the risk of developing breast cancer is about 12% in any woman's lifetime (Guimond, 2014). Therefore, we cannot ignore the impact that breast cancer has on our society.

According to the Centers for Disease Control and Prevention [CDC] (2015), some women have risk for breast cancer due to a combination of factors that are both modifiable and non-modifiable. There are severable non-modifiable risk factors such as; getting older, as most breast cancers are diagnosed after age 50, inherited genetic mutations to certain genes such as BRCA1 and BRCA2, early menstrual period before age 12, late pregnancy after age 30 or no pregnancy, having dense breasts, personal history of breast cancer, personal history of certain

non-cancerous breast diseases, family history of breast cancer, and starting menopause after age 55. There are also modifiable risk factors which include; sedentary lifestyle, being overweight or obese after menopause, using combination hormone therapy, taking oral contraceptives, previous treatment using radiation therapy and drinking alcohol.

A quality initiative in an outpatient primary care clinic setting in New York (NY) is necessary to improve breast cancer screening. At the project site, there is not a system in place to identify, manage, or refer women for appropriate care. Patients with abnormal finding should be referred to a specialist for further diagnostic workup and evaluation. Moreover, developing and implementing a breast cancer screening protocol and subsequently referring high risk women for evidence-based management will improve their outcome. A consequence of not having a breast cancer protocol in place for health care providers is the delay of a possible breast cancer diagnosis. This quality project will be developed to identify and implement a culturally sensitive breast cancer screening protocol based on best practices to be utilized by providers in this outpatient primary care clinic.

Background

In 1975, population-based cancer surveillance began for in situ and invasive breast cancer incidence and the first yearly recommended mammogram started in 1976 for women 50 years and over (American Cancer Society [ACS], 2015). In situ breast cancer Incidence rates rose rapidly during the 1980s and 1990s largely because of increases in mammography screening (American Cancer Society [ACS], 2015). Some of the historic increase in breast cancer incidence reflects changes in reproductive patterns, such as delayed childbearing and having fewer children, which are known risk factors for breast cancer (American Cancer Society [ACS], 2015).

Moreover, while there are established benefits associated with screening, many women do not comply with the recognized breast cancer screening guidelines. According to (American Cancer Society [ACS] 2014) African-American women have the lowest survival rates when compared to all other races. The high mortality rate is usually attributed to late detection and lack of screening.

Consedine et al. (2014) note that racial "labels are arbitrary and do not map clearly onto patterns of biological, environmental, or psychosocial risk. Their patterns of risk and exposure vary and endorse different values, beliefs, and expectancies regarding cancer-related health" (p. 906). Pavlish, Noor and Brandt (2010) concur that an information gap regarding immigrant health disparities currently exists. Besides, immigrants experience unique problems arising from language and cultural differences that may be barriers to their ability to seek and obtain healthcare (Harcourt et al., 2014). At the project site, a culturally sensitive breast cancer screening protocol based on best practices can be utilized by providers for all women who seek care in this outpatient primary care clinic. In addition, many of those women who seek care are of Hispanic decent, therefore, gaining a better understanding of the culturally specific needs of this population can lead to the creation of culturally appropriate health education programming. Cultural values determine, how patients will behave. Healthcare professionals are challenged to recognize diversity to deliver culturally competent health care.

To help reduce cancer and promote early cancer detection, the United States Preventive Services Task Force (USPSTF) has established the Healthy People 2020 goals (Healthy People, 2015). One primary goal of Healthy People 2020 is to reduce the number of new cases of cancer, illness, death, and disability that results from cancer (Healthy People, 2015). For example, there is a specific goal to decrease the rate of death from breast cancer from 20.7 deaths

per 100,000 to a rate of 10 deaths per 100,000 (Healthy People, 2015). Another target is the reduction of late detection of breast cancer. At the project site, there is not a system in place to identify, manage, or refer a woman with abnormal finding to a specialist for further diagnostic workup and evaluation. Moreover, developing a breast cancer risk assessment questionnaire such a pre-survey and improved counseling services can help identify women at increased risk for breast cancer. In addition, consideration to partner with another provider to manage referrals can be considered as this outpatient primary care clinic does not have one in place.

Statement of the Problem

The current problem is that women continue to die from breast cancer each year. At the project site, there is a diverse population of women seeking health care who are of age for having a screening mammogram. Currently, there are no protocols in place at this project site to screen these women to determine their risk for acquiring breast cancer. Furthermore, there is limited patient education provided by clinic providers regarding risk factors, prevention, and early detection.

This Doctor of Nursing Practice (DNP) project will provide a standardized care approach for best practice based on current evidence by implementing a breast cancer screening protocol for the healthcare providers with the provision for improved counseling services and management of women at risk of developing breast cancer.

Purpose Statement

The purpose of this quality improvement project is to implement a culturally sensitive practice protocol to increase breast cancer screening rates to potentially improve early identification and management of women at risk for breast cancer in an outpatient primary care clinic.

Project Objectives

The objectives of this Doctor of Nursing Practice (DNP) project are to:

1. Develop a culturally sensitive breast cancer screening protocol to improve early identification and management of women at risk for breast cancer
2. Educate the providers of an outpatient clinic to the protocol
3. Measure adherence to protocol through chart audits
4. Improve providers knowledge, skills, and attitudes towards breast cancer screening

The Project Question

The question is as follows: Will the implementation of a breast cancer screening protocol for health care providers increase screening for breast cancer and improve early detection during annual wellness exams and help providers identifying women at risk for breast cancer in the clinic setting?" To assist in determining the project question the population, intervention, comparison, outcome, and timeframe (PICOT) format was utilized (Echevarria and Walker, 2014).

1. Population- Health care providers in an outpatient primary care clinic such as medical doctors (MD) and Advanced Practice Registered Nurses (APRN)s.
2. Intervention- Implement a breast cancer screening protocol, which is based on current evidence
3. Comparison- Current practice/no protocol
4. Outcome- An increase in number of women screened and identified as at risk for breast cancer with a potential increase in early identification of women diagnosed with breast cancer. Providers will have a better understanding of management recommendations with the assistance of a breast screening protocol, brief intervention points, and pre-survey.

Refer women with abnormal finding to a specialist for further diagnostic workup and evaluation. Refer uninsured women to New York City Hospital.

5. Time- Within 3 months

Review Coverage & Justification

Conducting a systematic review of the literature is a key component to extrapolating relevant scientific evidence that yields support to particular clinical questions (Melnyk & Overholt-Fineout, 2015). PUBMED, CINAHL, PsycINFO, Google Scholar, and Cochrane databases were accessed to obtain substantial evidence to address the clinical question. The medical subject heading terms (MeSH) system were used to explore keywords for consistency and applicability. Searches included peer-reviewed articles, systematic reviews, meta-analyses, practice guidelines, clinical trials, randomized controlled trials (RCTs), qualitative studies, descriptive studies, and evidence-based-practice. Additional search limitations included setting the publication time frame to five years, sorting by relevance, and the inclusion of all article types (clinical trials, and systematic reviews) with full-text availability. The key terms included health education, breast cancer, prevention breast cancer, early detection breast cancer, education breast screening, breast education, health literacy related to breast cancer, breast cancer pamphlets, mammography, patient compliance with breast screening, barriers breast screening, prevention breast cancer, breast screening, organizational structure, and best practices. The key terms were utilized in different combinations, applying connectors AND, OR, and NOT to retrieve relevant content and to obtain the greatest number of results from these databases.

An inclusion criterion was established to facilitate obtaining applicable evidence. The author included studies that referenced women aged 40 years or over, interventions specific to promoting cancer screening, and mammography screening or cancer screening. Both clinical

and community settings were considered. The exclusion criteria included articles that were not specific to an intervention that improved cancer-screening adherence, did not address a targeted population of women, or did not have an outcome measure specific to mammography compliance.

Duplicate citations from among the searched databases were eliminated, leaving a total of 88 abstracts, all of which were initially reviewed to determine which evidence met the inclusion criteria. Inclusion criteria were articles were published since 2013. Out of the 125 abstracts, 37 of the articles were excluded due to duplication. Then 88 were reviewed and selected because they met the inclusion criteria. Upon further review, it was determined that some of these articles addressed barriers to care and did not discuss the interventions to the obstacles such as English as a second language, cultural barriers, beliefs, attitude to care, perspectives on healthcare.

Other articles were also excluded because they focused on survivorship after cancer care and other articles also focused on other types of cancer such as colorectal and cervical cancer screening. After this thorough review, 27 articles were read in full and met the full criteria relevant to the topic and were used in the final review.

Review Synthesis

This literature review guides the process improvement of implementation of evidence-based strategies to improve breast cancer screening in the outpatient primary care clinic.

Controversies to Breast Cancer Screening

Currently, there are contradictory recommendations for having screening mammograms. The USPSTF (2013), recommends biennial screening mammograms for women between 50-74

years of age. The American Cancer Society [ACS] (2015), recommends starting screening mammograms at 45 years of age or having an option to start at 40. The National Comprehensive Cancer Network [NCCN] (2015), recommends starting screening mammograms at the age of 40 and completing yearly mammograms as long as the woman is in good health. These conflicting recommendations can confuse women and may cause some women to wait until 45-50 years of age to initiate their screening mammogram. Therefore, it is the provider's clinical judgment to help decide and recommend what age is best for their patient to obtain their initial breast cancer screening based on risk factors and family history.

The mammogram has been shown to be one of the best methods to reduce late detection of breast cancer (CDC, 2015). The ACS (2014) recommends monthly self-breast examination (SBE) with every three-year clinical breast examination (CBE) and a yearly mammogram starting at the age of 40. Moreover, according to the Agency for Healthcare Quality and Research [AHRQ] (2014), the accepted best practice among the outpatient clinics is to screen for breast cancer every year starting at the age of 40.

Breast Cancer Disparities

According to the American Cancer Society (2014), breast cancer is one of the most common types of cancer in women, as one in eight women will develop breast cancer in their lifetime. Moreover, the American Cancer Society (2014) states the death rate from breast cancer is 21.5% in all races, but among whites, the death rate is 20.9%, in blacks it is 30.2%, for Asian and Pacific Islanders (11.2%) and Hispanics (14.1%). Although Hispanics and African-Americans have lower incidence rates of cancers, their prognoses at the time of diagnosis is poor (Consedine, Tuck, Ragin, & Spencer, 2014). The women who seek care at the project site consist of several ethnic populations, but mostly Hispanic decent, and African American.

Current management

With the complexity of healthcare sometimes makes it difficult for many women to participate in preventative care. Some of the families have limited resources, lack health insurance, and do not know how or choose not to seek medical help when the need arises. Conducting a project at this site will be beneficial to this diverse population in numerous ways. Research has consistently conveyed that mortality rates decrease with adherence to utilizing mammography screening (Hendrick & Helvie, 2011). In women 40–84 years old, annual mammography screening has proven to be the most advantageous cancer intervention, yielding a significant mortality reduction (Hendrick & Helvie, 2011). Therefore, the use of mammogram should be encouraged to help in the prevention and detection of early breast cancer in the project site.

Further, by implementing this EBP project it will empower the women, as they will be educated and provided with pertinent information to increase their breast cancer awareness (BCA) and will be equipped with the confidence necessary to undergo mammogram screening. According to the literature review by CPSTF (2012) health education and group education are effective tools to increase breast screening uptake.

For certain screening procedures such as mammography which can be costly for patients with low socio-economic status and without health insurance, a free-of-charge screening should be available through collaboration and networking for financial support from the government and non-government organizations. Collaboration with the group leaders and community health workers may also be effective in reaching out women that needs breast screening services as showed in studies done by ACS (2016).

To further increase the compliance for breast cancer screening the literature has also shown that an extra effort of telephone contact on an individual basis, intensive health education campaigns, use of printed materials and social networking campaigns against breast cancer are among the efforts that can influence the knowledge and attitude of patients towards breast cancer awareness. For health care professionals, the success of a patient- focused or client-centered approach in case management requires sensitivity to cultural values, beliefs and practices with respect to their individualities (Alcazar-Bejerano, (2014).

Identification and classification of cultural health beliefs and practices accepted or maintained if harmless, negotiated or restructured, are an effective method to provide a culturally congruent and specific care (Koppenol-van, 2007). For instance, in many cases spouses or partners do not encourage cancer screening due to privacy and sensitivity issues (Tang, 2000). Therefore, these findings are important for the health care providers to further investigate the health care behaviors of many patients and educate them the importance of breast screening. Research shows that a recommendation from a healthcare provider is the most important reason patients cite for having cancer screening tests (Wee, McCarthy, & Phillips, 2005). Addressing heath disparities using competent culturally advanced nursing interventions and evaluating the complex health interventions for their effectiveness is an additional tool for healthcare providers to manage patients.

Moreover, many studies showed that women perceived providers have the tendency not to provide information to individuals belonging to a lower social class and/or different ethnic group, as well absence of referral from health care providers is a common barrier for most women to undergo breast cancer screening (Hanson, 2009). Therefore, further investigation in the current practice is needed to assess stereotyping among many health care professionals

towards women from different ethnic group who are perceived as powerless, less educated and passive (O'Malley et al, 1999) and to make sure that providers provide appropriate patient education and referral. According to many reviewed studies there are many relevant factors that affect women's compliance to cancer screening such as educational level, marital status, availability of health insurance and access to health care services, and recognition of high-risk groups such as those with a family history of breast cancer. Therefore, the importance of individualized and focused assessment should be made by health care professionals.

Barriers to Breast Cancer Screening

There were similar findings among patients included in the studies that researched the barriers to breast cancer screening. These included lack of insurance, underinsurance, socioeconomic factors, racial factors, lack of knowledge or limited health literacy in terms of mammography, and how to navigate through the complex organizational processes (Anhang Price et al., 2010; Davis et al., 2002; Halverson et al., 2015; Komenaka et al., 2015; Smith et al., 2013; Task Force, 2013; Todd & Stuifbergen, 2011).

Moreover, poverty and economic status were found to be the most influential impediments to mammography compliance (Alexandraki & Mooradian, 2010). According to the ACS (2016), outreach programs and services should target women who fall within the parameters of poverty, as this population compared with more affluent populations tends to have lower rates for screening mammography. Furthermore, limited resources such as income and healthcare insurance, may prevent women from accessing screening services. These women may prioritize supplies, such as food, shelter, clothing and education, for their family members over their own health care.

A crucial contributing factor is that low socioeconomic status (SES) is correlated with low educational levels (Todd & Stuifbergen, 2011). Low education levels influence knowledge levels and impact one's ability to access, navigate, and comply with health services and recommendations. This predisposes this population of women to less than optimal overall healthcare outcomes (Alexandraki & Mooradian, 2010; Todd & Stuifbergen, 2011).

Interventions

There was an aggregate of interventions or strategies identified in the literature that can be considered for the proposed process improvement to breast cancer screening in a primary care clinic. The interventions and strategies that can be utilized to address the demand for continuous improvement of screening programs include many components enabling patients to schedule their appointments via telephone calls was associated with increases in mammography use (Anhang Price et al., 2010; Stone et al., 2002; Weingart et al., 2009). Also, tailored mailings and telephone counseling based on patient barriers to screening (cognitive, logistical, affective), previous screening history, intention to be screened or not, and/or another pertinent chart data had mixed results in terms of having a significant impact on screening rates.

Nonetheless, tailored telephone counseling consistently had substantial effects on the promotion of mammography (Anhang Price et al., 2010). In addition, provider recommendation was found to be significantly associated with patient's mammography adherence. Prompting providers through electronic or paper chart reminders had positive associations in several studies (Anhang Price et al., 2010). The examination of evidence established that interventions should include all team members and be tailored to meet the specific needs of the primary care clinic (Anhang Price et al., 2010).

Review of Study Methods

According to Melnyk and Fineout Overholt (2015), appraising evidence critically is essential in the evidence-based practice process. Critical appraisal of evidence is a vigilant and systematic process of evaluation of research, which determines the trustworthiness and relevance of an article or study to a particular context (Melnyk & Overholt-Fineout, 2015).

Further, the level and quality of evidence determine the strength of the evidence. The level of evidence can directly allow for sufficient confidence to facilitate action and implementation of a change practice (Melnyk & Fineout-Overholt). For this project, the seven levels of the Hierarchy of Evidence provided by Melnyk and Fineout-Overholt were utilized. Level I evidence comes from systematic reviews or meta-analysis of random controlled trials, making this the best available evidence. Level II involves evidence from well-designed random control trials. Level III includes evidence obtained from well-designed controlled trials without randomization, such as quasi-experimental designs. Level IV contains evidence from a well-designed case-control and cohort studies. Level V involves evidence from systematic reviews or descriptive and qualitative studies. Level VI encompasses evidence from single descriptive or qualitative studies. And Level VII includes evidence from the opinion of authorities and/or reports of expert opinions.

Appraisal of Relevant Evidence

The final appraisal included the sample of 27 articles. Level-I evidence. According to Melnyk and Fineout-Overholt (2011), a meta-analysis is a type of evidence that is “based on several random controlled trials and it generates an overall summary statistic that represents the effect of the intervention across multiple studies.

Educational Intervention

Health education is a strategy that has been emphasized in the United.States (US) - healthcare system in disease prevention and early detection of diseases such as breast cancer. The literature review resulted in one Level I study, one Level II studies, two Level III study that explored the impact of health education (Alkahlili et al., 2015; Burgess et al., 2009 Dieng et al., 2014). Seven, Akyüz, and Robertson (2015) explored three methods of education: individual, individual with an educational brochure for spouses, and group, on participation in breast cancer screening and found that group education was an effective method of increasing breast cancer knowledge and screening awareness. The study was derived from an extensive literature review, utilizing block randomization with a sample size sufficient to achieve statistical significance (N = 327), suggesting that study findings have significant credibility and generalizability. Bushatsky et al.'s (2015) quasi-experimental study reinforced that the health knowledge among a convenience sample of 84 women notably improved after a health education intervention. The educational content was comprised of breast cancer symptoms, performance of a breast self-examination, and modifiable risk reductions through dialogue and visualization (Bushatsky et al., 2015). Content specific education delivered in a manner to address improving participants' general education knowledge about disease and risk factors was found to have statistically significant effects (Bushatsky et al., 2015).

A similar study conducted with a small group of Korean women demonstrated that a tailored education based on the individual's pretest data information had a positive correlation with breast cancer awareness, self-efficacy for breast self-examination, and intent to participate in screenings (Park et al., 2013). The information incorporated risk factors,

knowledge, screening, behaviors of breast cancer, and breast cancer prevention behaviors (Park et al., 2013). The generalizability is limited and related to the small and homogeneous sample population. Although a criterion was established for study participants, the assignment of treatment was nonrandom, which impacts the study's internal validity. These findings provide worthy proposal support for the use of family health education intervention in improving breast health literacy.

Güçlü and Tabak (2013) and Burgess et al. (2009) similarly determined that health education activities conjoined with health screenings increased women's overall knowledge of breast cancer. In addition, Burgess et al. (2009) investigated the sustainability of the knowledge by conducting one-month post-intervention assessments and found that the mean knowledge of breast symptoms increased and maintained at six months. The findings established that printed education only and combined printed education and interview are effective interventions to improve sustained knowledge attainment. In contrast, Maxwell et al. (2008) found that the use of printed educational material did not result in statistically significant increases in mammography screenings and suggested the exploration of combined education strategies to increase education and subsequent behaviors. A mixed experimental and qualitative study design reiterated that a diverse community-based education intervention had a positive effect on increasing knowledge of breast cancer (Zeinomar & Moslehi, 2013).

Community Preventive Screening Task Force [CPSTF] (2012) has also verified that one-on-one health education and group education are effective tools to increase breast screening uptake. However, tailored education was found to have an increased effect on mammography uptake compared with untailored education strategies (CPSTF, 2012). The Task Force endorses

one-on-one health education based on strong evidence, while group education is proposed based on sufficient evidence (CPSTF, 2012).

An individual's ability to gain knowledge or comprehend knowledge is a necessary outcome of health-related information (Smith et al., 2013). Unfortunately, consistent and accurate uses of such principles by primary care providers and clinic organizations are lacking (Hersh et al., 2015). Significant barriers to evidence-based practice adoption include lack of knowledge or skills, negative attitudes, limited time for the patient encounter, and lack of organizational support (Hersh et al., 2015). Healthcare providers often do not address health literacy in routine patient care, overestimate patients' health literacy, and incorrectly assume that health information and instructions have been understood (Dewalt et al., 2010; Kripalani & Weiss, 2006).

Access to Care

Even though numerous local, state, and national healthcare programs have been developed to improve access to preventive services and breast cancer survival rates, disparities still exist among some populations of women. In a recent review of the literature, researchers established that women with low socioeconomic status, lower education levels, a lack of insurance, and lack of regular access to a primary healthcare provider are among the population of women who have low mammography compliance (Alexandraki & Mooradian, 2010; Todd & Stuifbergen, 2011). The authors further discussed that these barriers directly impact the compliance of mammography screenings (Alexandraki & Mooradian, 2010). Poverty and economic status were found to be the most influential impediments to mammography compliance (Alexandraki & Mooradian, 2010).

Research has conveyed that organizational processes impact mammography adherence (Anhang Price et al., 2010; Stone et al., 2002; Weingart et al., 2009). The mammography screening process requires a series of steps by the triad of organization, patient, and health providers. Failures or breakdowns in the process can delay mammography screening, thus negatively affecting breast health outcomes (Weingart et al., 2009). Investigators have examined both screening process failures and strategies that can be utilized to address the demand for continuous improvement of screening programs, which are necessary to facilitate early detection and treatment of breast cancer (Anhang Price et al., 2010; Stone et al., 2002; Weingart et al., 2009).

Organization Barriers and Interventions

There are a number of studies that evaluated the effects of attributes of the breast screening process on mammography adherence (Anhang Price et al., 2010; Stone et al., 2002; Weingart et al., 2009). In a systematic review, 49 of 79 studies evaluated the association of organizational factors and mammography adherence (Anhang Price et al., 2010). Eight studies assessed scheduling appointments and discovered that enabling patients to schedule their appointments via telephone calls was associated with increases in mammography use (Anhang Price et al., 2010). Tailored mailings and telephone counseling based on patient barriers to screening, previous screening history, intention to be screened or not, and/or other pertinent chart data had mixed results in terms of having a significant impact on screening rates.

Nonetheless, tailored telephone counseling consistently had substantial effects on the promotion of mammography (Anhang Price et al., 2010). In addition, provider recommendation was found to be significantly associated with patient's mammography adherence. Prompting providers through electronic or paper chart reminders had positive associations in several studies

(Anhang Price et al., 2010). Although the studies' outcomes quantified the provider rate of referral or ordering of mammography, investigators linked physician–provider interaction, knowledge, and attitudes as influences on screening behaviors, suggesting that such variables should be further evaluated in future research studies (Anhang Price et al., 2010).

Stone et al. (2002) evaluated the effectiveness of a variety of approaches to promote preventive care services, such as cancer screenings. The meta-analysis of 108 randomized controlled clinical trials concluded that the most effective interventions entailed organizational changes (Stone et al., 2002). The interventions included the use of designated clinics for particular prevention screening, planned preventive care visits that included patient education, and utilization of non-physician staff to facilitate prevention activities (Stone et al., 2002). The studies substantiated that targeted changes that address deficits in work processes can increase patient use of preventive services. In addition, health authorities have established some evidence-based recommendations in the realm of organizational processes that increase mammography adherence (CPSTF, 2012). The CPSTF (2012) has determined that reducing out of-pocket costs has a positive effect on mammography acquisition. Measures identified to minimize or reduce economic barriers included the use of vouchers, adjustments in federal and state insurance coverage, and funding through programs (CPSTF, 2012).

The interventions were combined with patient education and information about program availability and necessary patient actions to alleviate structural barriers (CPSTF, 2012). The CPSTF (2012) found the strategies to reduce the out-of-pocket cost to be sufficient for recommendation.

Organization changes such as reducing or eliminating administrative steps, limiting clinic visits, use of patient navigators, and providing and simplifying scheduling were the combination

of interventions that were mediating factors to increasing breast-screening mammography use (CPSTF, 2012). The CPSTF identified a total of eight studies to assess the relationship between removal of structural barriers and mammography screening rates, finding that each study had a 17.6% average increase in mammography screening. The CPSTF, therefore, recommends this strategy on the basis of strong evidence (CPSTF, 2012).

A meta-analysis conducted by Han et al. (2009), the goal was to determine if the interventions intended to increase breast cancer screening and mammography among women from different ethnic minority were useful. The participants in the studies included African Americans, Asians, and Hispanics.

The types of studies used were quasi-experimental, group level assignments and community-based studies. The samples ranged from 100 to over 5,000 participants. Most of the studies evaluated by the authors included the use of culturally targeted approaches. The studies used single or multiple intervention strategies. Six studies did use access-enhancing strategies, which promoted low- or no-cost mammograms, mobile vans or vouchers. (Han et al.). After analyzing the results, the authors "determined that access enhancing strategies were the strongest intervention approach: Leading to an increase in mammography use by 18.9% (95% confidence interval [CI] = 10.4–27.4), followed by individually directed interventions in a healthcare setting (17.6%; 95% CI = 11.6–24.0)" (Han et al., 2009, p. 6). The rate of mammography used by minority women in the treatment groups receiving multiple interventions improved by 7.8% (Han et al.). The largest increase in mammography use of (15.5%) was found in access-enhancing interventions tailed by individually directed interventions (9.9%) (Han et al.). The use of lay health workers only showed a small improvement and for that reason, it is advisable to employ this method of intervention only in small community settings (Han et al.). The

authors also found that individual strategies such a reminder letters, telephone calls, or personal contact, do increase mammography use. Based on the combined results, "the overall mean weighted effect size for the 23 studies was 0.078 (Z= 4.414, p,.001) with a 95% CI of 0.043 to 0.013, demonstrating that the interventions were effective in improving mammogram screening among minority women" (Han et al., 2009).

Schoueri-Mychasiw et al. (2013) conducted a systemic review of eight peer-reviewed publications. The authors chose to use the Health Belief Model (HBM) and PRECEDE-PROCEED models due to the appropriateness of the two models in understanding experiences of health behavior in the development of interventions in improving mammography screening, using the PRECEDE PRECODE model, the emphasis of the review was to assess the needs of the target group prior to implementing any changes. Four of the study designs used the pre-post comparison, three studies compared a control and comparison intervention method, and one study compared the population screening data 3 years before the intervention with the sample of women in the study. The sample sizes among the studies ranged from 34 to 2,064 women. One study did not indicate the sample size that was used. The types of interventions used varied and included that targeted knowledge and language. Two studies showed no significant differences while the other six studies indicated an increase in the screening ranging from 5% to 70% (Schoueri Mychasiw et al., 2013). The study with the highest screening rate of 70% employed a small sample population and involved a one-on-one intervention in home settings. According to the authors, the goal should be about implementing interventions that target barriers such as knowledge and language, and the use of strategies such one-on-one interventions to increasing the screening among immigrant and minority women. These findings provide worthy proposal

support for the use of health education intervention in improving breast health literacy in minority women.

Lu et al. (2012) conducted a search in 15 databases, including gray literature, for evidence. PRISMA statement was used in reporting the reviews of the studies. The six reviewers were divided into three groups of two each. A total of 37 studies were included for review; however, due to the heterogeneous nature of the studies, a meta-analysis was not possible. Apart from breast cancer, included in the review were cervical cancer screening studies too. To assess the quality of the included RCTs, the Jadad scoring system was used. Owing to the heterogeneity of the interventions and conclusions, no recommendation was deemed satisfactory to measuring the quality of the observational studies included in the review interventions targeting patients included two types: Individual-based interventions, which included culturally sensitive print or audiovisual materials, home education visits, screening reminders, case management, mobile screening services, free or subsidized screening services; and group-based interventions, which included community-based, workplace-based, church-based, and grocery-store-based group education and media campaigns. (Lu et al., 2012).

Due to variation in the study populations and their geographic locations, the results differed significantly. Special attention to cultural and social factors should be considered before choosing a method to be used in promoting cancer screening. Being culturally competent is likely to help health care workers overcome language and cultural barriers and lead to increase in screening in Asian populations. The researchers concluded that, while interpreting results or adopting particular interventions, the vast cultural diversities among Asian women should be considered (Lu et al., 2012). Melnyk and Fineout-Overholt (2011) report that the “purpose of the

randomized controlled trial is to compare the efficacy or effectiveness of the research design in producing an outcome, without it being by chance" (p. 113).

Lee et al. (2014) conducted a two-group cluster randomized, longitudinal, controlled study over two years. The goal of the study was to introduce a couple's intervention to assess whether it could help increase breast cancer screening among Korean American (KA) immigrants. For the culturally sensitive intervention, known as the Korean Immigrants and Mammography Culture-Specific Health Intervention (KIM-CHI) program, the authors developed a Korean-language film in digital video disc (DVD) format, designed to change non- adherent KA women's culture-specific beliefs and improve spousal support to promote adherence to mammography screening" (Lee et al., 2014, p. E186).

According to Lee et al. (2014), the support and encouragement of family members played an essential role among the women because those who were supported and encouraged were four times likely to comply with screening unlike those that did not. The logistic regression models were used to measure the probability of getting a mammogram at 15 months (Lee, et al., 2014).

The researchers found that culturally targeted intervention that focuses on "variables are commonly known to affect mammography use; for example, perceived susceptibility, seriousness, benefits, barriers, and spousal support, was effective in improving mammography uptake in KA women" (Lee, et al., 2014, p. E189). Digital video disc (DVD) messages consisted of constructs of perceptions. In this study, it was found that culturally sensitive methods intended to improve mammogram use were efficient (Lee et al., 2014).

This literature review has guides the process for improvement of implementation of a cultural evidence-based strategy for breast cancer screening in the outpatient primary care

clinic. It is likely that cultural and social intervention can be used to improve mammogram uptake in women of all ethnic group.

Wang et al. (2012) conducted a RCT comparing the efficacy of the three-armed randomized interventions using the HBM to guide the study. The sample included 664 Chinese American women, from the Washington, DC and New York City areas, who were over 40 years of age and non-adherent to annual mammography screening guidelines. Each of three-arm versions of the study consisted of 221 women. The trained bilingual interviewers "utilized a computer-assisted telephone interview (CATI) system to conduct baseline and two follow-ups assessments" (Wang et al., 2012, p.1926). Immediately after baseline assessments were completed, women were randomly assigned to one of three groups: the culturally targeted video, a generic video, and a fact sheet (control) for promoting mammography screening among Chinese-American immigrants. The study outcome of self-reported mammography screening was assessed six months post intervention. Knowledge, Eastern cultural views, and health beliefs were measured before and after the intervention. The videos were comprised of the components themes of the HBM "perceived susceptibility, perceived severity, perceived benefits, and perceived barriers" (Wang et al., 2012, p. 1925), also knowledge was included as an additional variable. Only one video included Chinese cultural beliefs, and it served to debunk the cultural myths having to do with luck and karma as well as fatalistic ideas or the notion that one should only see a physician when he or she is sick. To analyze the main intervention effect, logistic regression including two models was used. The two methods included "standard, which is the maximum likelihood estimates, and Bayesian approaches to obtain treatment effect parameters; using the two methods yielded similar estimates" (Wang et al., 2012 p.1927). According to the researchers, among low-acculturated women, those who viewed the cultural

intervention video experienced a significant increase in mammography use over the control group; however, similar results were not found among high-acculturated women. Among the participants that viewed a generic video (as compared to the control group) whether they had low- or high-acculturation groups, no increase in mammogram screening was noted. Among the subgroup of women who had never had a mammogram, neither intervention led to a statistically significant increase in the odds of obtaining a mammogram compared to the print control group. Despite the results not being significant, "the cultural video led to an 81% increase in the odds of obtaining a mammogram compared with the print control" (Wang et al., 2012, p. 1928).

According to the researchers, the women who perceived that they had fewer barriers post intervention was likely to undergo screening for breast cancer using mammogram. Lee-Lin et al. (2015) conducted a RCT among 300 women in Portland, Oregon. The aim of this study was to, "test the efficacy of a theory-driven, culturally responsive, targeted breast health educational program (TBHEP) in increasing mammogram screening among Chinese American immigrant women in Oregon compared to similar women who were part of a brochure control group" (Lee-Lin et al., 2015, p. 174). The HBM and the Transtheoretical Models were used to guide the study. The convenience sample of women was obtained from the Asian Community Organization. It had been noted that 70% of the people who belong to the Asian Community Organization do not have insurance and live below the poverty level. The researchers evaluated the efficacy of a TBHEP compared to a brochure control group in increasing mammogram screening. To measure the results, the TBHEP Foreign Born Chinese Women's Questionnaire, developed with the (Cronbach alpha ranged from .71 to .89) (Lee-Lin et al.), validation of the content of the questionnaire was completed by using the cultural experts and critiqued by the ten Chinese-American immigrant women who represented the targeted population (Lee-Lin et al.,

2015). Post-intervention analysis at three, six and twelve months showed "significantly more women in the intervention group reported having completed a mammogram compared to the control group" (Lee-Lin et al., 2015, 177). Further, "both the TBHEP intervention and brochure control groups produced an increase in screening mammograms; however, significantly more women in the intervention group (59.2%, 68.7%, and 71.4%) had completed mammograms than in the control group (18.3%, 26.8%, and 42.5%) at three, six, and twelve months post-intervention respectively." (Lee Lin et al., 2015, p. 175). Using culturally targeted intervention extensively increased one-time mammogram completion among Chinese-American immigrant women. It is likely that this same intervention can be used for women who are without health insurance. When offered at a reduced-cost or fully funded mammogram screenings, there is a greater chance that more women will undergo testing just as the Chinese immigrant women in the study did.

According to Melynk and Fineout-Overholt (2011), level IV "consist of well-designed case-control and cohort studies" (p. 10). Evidence at this level is moderately strong evidence. According to Kagawa-Singer et al. (2009), The Life Is Precious program is the first study in the US designed to increase breast cancer screenings among Hmong women. This study was a three-year community collaborative research project that "intended to promote breast self-examination, clinical breast examination, and mammography use among Hmong women in central and southern California, 53% of women live in poverty and 84% of whom earn less than 200% of the federal poverty line" (Kagawa-Singer et al., 2009, p. S467). Health literacy among Hmong women who are older than 50 years of age is poor, and educational attainment in both Laos and the US are extremely low. The Hmong are "unfamiliar with Western biomedical concepts, and screening technology and medicines constitute additional challenges to appropriate

uses of prevention and early detection services" (Kagawa-Singer et al., 2009). The researchers used a quasi-experimental cohort design with two intervention cities (Fresno and San Diego) and one comparison city (Long Beach) (Kagawa-Singer et al., 2009).

Due low levels of breast cancer screening among the Hmong women, that were found after the evaluation of the records of 1997-1999, hence the initiation of this project. (Kagawa-Singer et al., 2009). The unique breast cancer education workshop programs were designed by the researchers in the two intervention cities, with a goal of enrolling 150 women and 150 men. Hmong men were specifically included in this outreach, due to their roles as "the primary decision-makers among Hmong families and communities" (Kagawa-Singer et al., 2009, p. S468).

The education sessions were conducted in culturally appropriate places, including temples and community buildings. Due to lack of formal education among the Hmong, especially new immigrants, cultural communication strategies, such as storytelling, playing cultural games and eating food, were used to help make the experience more familiar to the participants (Kagawa-Singer et al., 2009). The authors used bivariate analyses to examine whether substantial differences existed between groups (i.e., intervention vs. comparison) by using the test (for categorical data) and t test. It was determined that rates of breast cancer screening was higher in women that had participated in the group intervention. Knowledge and attitudes regarding screenings "increased and improved respectively between baseline and follow-up in both the comparison and intervention communities addressing literacy issues" (Kagawa-Singer et al., 2009, p. S470). Due to the Hmong population's limited English-speaking abilities, using "innovative educational and assessment strategies appropriate to their literacy levels and congruent with their culturally familiar modes of learning new information were key

elements to the effectiveness of this intervention design" (Kagawa-Singer et al., 2009, p. S471). Maxwell et al. (2011) evaluated the feasibility, acceptability, and potential effect of a small group video intervention led by trained Chinese-American lay educators. The lay teachers were involved in recruiting and educating recruited Chinese-American women who were not up to date on mammography screening for breast health education. Additional assessment involved assessing the acceptability of this format and its potential effectiveness in increasing screening among group attendees. The lay educators conducted the training using the following three formats: viewing a soap-opera style video in Chinese language that encouraged screening; facilitating structured discussion among participants about barriers to screening and strategies to overcome barriers; and disseminating information on local resources and providers for low- or no-cost mammograms. "The video production was guided by the HBM, and a previous study previous studies which demonstrated efficacy in changing knowledge, beliefs and screening intentions after women in the target audience viewed it individually" (Maxwell et al., 2011, p. 3). The University of California approved the study protocol and materials, which involved nine lay educators conducting "breast health tea time workshops". The education was conducted in community settings and private homes. The sessions began with participants watching a culturally tailored video promoting screening and moved on to a question-and answer session and distribution of print materials. Breast health information workshops were piloted at churches, community-based organizations, and private residences. Lay health educators facilitated the question and answer session and distributed a Chinese pamphlet titled "Breast Health: Learn the Facts" as well as and a list of local facilities providing low- or no-cost screening mammograms. Chinese culturally-based beliefs were addressed in the video in many ways (Maxwell et al., 2011). The participants were engaged a soap-opera-style

story (i.e., a story that depicted a Chinese breast cancer survivor's 50th birthday) which conveyed reality and cancer stigma. Information delivered by a Chinese female physician viewed as a medical authority figure. Cultural beliefs addressing fatalism and cancer, yin-yang balance in the body, attitudes toward Western examination, social and family support, and family history, were all depicted in the soap-opera-style video. The physician presented statistical data relevant to Asian women, and metaphors to help women understand their risks as well as how and why regular mammograms save lives. The researchers discussed ways to overcome language barriers and embarrassment. Variations in knowledge and attitudes from pre- to post-survey were analyzed. Results showed that the small-group video intervention was successful in increasing knowledge and positively influenced attitudes and cultural beliefs regarding mammography screening and mammography utilization. Most notable, during the follow-up period, was the change in attitudes regarding whether or not mammograms are needed in the absence of symptoms. According to Maxwell et al. (2011), this pilot study demonstrates the feasibility of recruiting and training Chinese American lay educators to conduct small-group sessions that serve to promote mammography screening via by culturally tailored videos in community settings.

Significance of Evidence to Profession

There is evidence to support many culturally sensitive strategies that increase use of mammogram and increase breast cancer awareness in women. After conducting a literature review, the DNP student had established that there was a dire need to establish a culturally sensitive awareness among women to increase breast cancer screening. Women in the US need to be able to understand the benefits of the screenings, and they need to be made aware of the resources available to them so that they will be more inclined to undergo screenings. The

literature also supports the need to implement culturally tailored interventions. The location of the project provided a special type of network that enabled the DNP student to target many ethnic groups, including African American and Hispanic female immigrants and their spouses as well if they decided to participate by them being the head of the houses or decision makers. The use of spousal support was found to be useful in increasing breast cancer awareness per (Lee at al., 2014 & Kagawa-Singer et al., 2009).

In summary, a delay in screening for breast cancer care leads to late cancer detection that causes early mortality. To promote the use of mammogram and increase breast cancer awareness using culturally sensitive methods is recommended. Effective breast-screening programs are required connectors to mammography, thus are essential components to addressing the persistent increase in breast cancer mortality. Doctoral prepared nurse practitioners are in a unique position to synthesize their clinical expertise and the application of scientific underpinning to bring resolutions to specific problems, deficiencies, and complexities of screening processes. It is imperative that DNP's utilize their knowledge of the promotion of health, disease prevention and to influence women to follow through with breast screening for the prevention of breast cancer.

Theory Identification & Discussion of Historical Development

The Six Sigma DMAIC methodology is the framework that was selected to guide the development, implementation, and evaluation of breast cancer screening protocol based on best practices to be utilized by providers in this outpatient primary care clinic. The acronym DMAIC stands for define, measure, analyze, improve, and control (Moran, Burson, & Conrad, 2014).

This methodology or management system was developed in 1986 by engineer Bill Smith while working at Motorola as a method to reduce variability in manufacturing (Moran, Burson,

& Conrad, 2014). Today, Six Sigma methods are used in a variety of arenas ranging from manufacturing, to government, to healthcare organizations (Chapman, 2011).

The focus of this methodology is improving quality and reducing errors and variation (McLaughlin & Hays, 2008). "A good Six Sigma implementation plan will identify what activities to implement, how to do them, who will do them, when they will be started and completed, and how they will be measured" (Arthur, 2011, p. 44). This framework will assist the project lead with the implementation process of the breast cancer screening protocol.

Applicability of Theory to Current Practice

The Six Sigma DMAIC will provide a theoretical basis for identifying methods to improve provider knowledge of breast screening protocol through assessing barriers, as well as selecting, tailoring, and implementing educational interventions.

Impressive examples over the past several years illustrate the value of utilizing Six Sigma and related best practices for healthcare quality and process improvement to current practice. Kuwaiti et al. (2017), utilized the Six Sigma DMAIC framework to evaluate the impact of adopting the Six Sigma DMAIC approach in reducing patients fall rate in an academic medical center, Saudi Arabia. Appropriate strategies were identified through the process of brainstorming and were implemented to study the potential causes leading to the occurrence of falls. The pre-intervention falls rate was reported as 6.57 whereas the post-intervention fall rate was measured as 1.91 (demonstrating a 70.93% reduction) after the implementation of improvement strategies (Kuwaiti et al., 2017). In addition, the adherence rate toward the practice of carrying falls risk assessment and hourly rounding was observed to be high 88% of nurses are regularly practicing hourly rounding (Kuwaiti et al., 2017). Finally, a greater reduction in patients fall rates was observed after the implementation of the improvement strategy DMAIC.

Another example of the DMAIC framework that is relevant in current practice is noted in the article Engaging Clinical Nurses in Quality Improvement Projects by Moore & Stichler (2015). The article reviews a process for professional development of clinical nurses that helped them to define, implement, and analyze quality improvement or evidence-based practice projects by using the Six Sigma DMAIC model (Moore & Stichler, 2015). The DMAIC framework facilitated clinical practice changes, with improved patient outcomes; a unit cultural shift, with appreciation of quality improvement and evidence-based projects; and engagement with colleagues (Moore & Stichler, 2015).

Research has shown that Six Sigma has achieved measurable success when appropriately implemented with leadership support and the utilization of change management techniques to address cultural barriers and build acceptance. Therefore, the Six Sigma DMAIC approach will help in decision-making techniques and induce a beneficial transformation in the organizational culture when planning to implement a breast screening protocol.

Discussion of Major Tenets of the Theory

The Six Sigma DMAIC framework is an evidence-based process improvement strategy. According to Moran, Burson, & Conrad (2014), DMAIC is a Six Sigma problem-solving method that uses the five stages of quality improvement and consists of the following tenets:

Define

Using the DMAIC framework, the practitioner defines the opportunity for improvement, the project goals, and the key stakeholders (Moran, Burson, & Conrad, 2014). Moreover, the main objectives during the define phase is to identify and/or validate the improvement opportunity, and to develop the business processes, define critical customer requirements and prepare themselves to be an effective project team (Lean Six Sigma Methodology, 2018).

Therefore, the project lead defines the scope of the project, who the customers are, what their requirements are for the services, what their expectations are, the project boundaries and the process to be improved. Tools that may be used are project charter, project status report, issue log, process flowchart, and work breakdown structure (Moran, Burson, & Conrad, 2014). During the define stage some of the activities may include:

Identify the scope of the project;

- Identify stakeholders;
- Identify team members;
- Develop team charter;
- Identify and map processes;
- Identify quick win and refine process;
- Develop team guidelines and ground rules (Lean Six Sigma Methodology, 2018).

Measure

During the measure stage, the practitioner measures the performance; the current state of the process (Moran, Burson, & Conrad, 2014). In addition, the practitioner determines what to measure and collect the data tools that may be used (Moran, Burson, & Conrad, 2014). Therefore, the main objectives during the measure phase is to identify critical measures that are necessary to evaluate the success, meeting critical customer requirements and begin developing methodology to effectively collect data to measure process performance (Lean Six Sigma Methodology, 2018). During the measure stage some of the activities may include:

- To identify input, process and output indicators;
- Develop data collection plan;
- Plot and analyze data;

- Determine if special cause exists;
- Collect other baseline performance data;
- Failure modes and effects analyses (Lean Six Sigma Methodology, 2018).

Analyze

During the analyze stage, the practitioner analyzes the data to identify opportunities, improves the process, or fix the problem (Moran, Burson, & Conrad, 2014). Analyzing the data collected will identify any flaws that requires improvement and will ascertain if the implementation of the new process was successful if the objectives were met (Moran, Burson, & Conrad, 2014). The objectives during the analyze phase is to identify specific, analyzes the data to identify sources of variation and potential failure modes (Lean Six Sigma Methodology, 2018). During the analyze stage some of the activities may include:

- Stratify Process;
- Stratify data and identify specific problem;
- Develop problem statement;
- Identify root causes;
- Design root cause verification analysis;
- Validate root causes;
- Comparative Analysis;
- Process control (Lean Six Sigma Methodology, 2018).

Improve

During the improve stage, the provider makes the needed changes based on analysis tools that may be used: Brainstorming; failure modes and effects analysis (Moran, Burson, & Conrad, 2014). The objectives during the improve stage is to identify, evaluate and select the right

improvement solutions and to develop a change management approach to assist the organization in adapting to the changes introduced through solution implementation (Lean Six Sigma Methodology, 2018). Therefore, the project lead will design solutions to fix and prevent problems and develop an implementation plan. During the improve stage some of the activities may include:

- Generate solution ideas;
- Determine solution impacts: benefits;
- Evaluate and select solutions;
- Develop and present storyboard;
- Develop process maps and high-level plan;
- Communicate solutions to all stakeholders;
- Develop pilot plan and pilot solution (Lean Six Sigma Methodology, 2018).

Control

During the control stage, there is a control plan to insure sustainability in the process which can be achieved by developing a monitoring plan tool (Moran, Burson, & Conrad, 2014). Therefore, in this stage the new process is adopted, policies and procedures are developed and a control of improvements are kept. The objectives during the control stage is to understand the importance of planning and executing against the plan, determine the approach to be taken to assure achievement of the targeted results and to understand how to disseminate lessons learned, identify replication and standardization opportunities/processes, and develop related plans (Lean Six Sigma Methodology, 2018). During the control stage some of the activities may include:

- Identify whether additional solutions are necessary to achieve goal;
- Identify and develop replication and standardization opportunities;

- Integrate and manage solutions in daily work processes;
- Integrate lessons learned;
- Identify teams next steps and plans for remaining opportunities (Lean Six Sigma Methodology, 2018).

Application of Theory to DNP Project

The application of DMAIC framework to the project will be a valuable tool for facilitating the use of evidence-based knowledge to identify gaps from current practice to the standard of care. It will help evaluate the knowledge and awareness of primary care breast screening guidelines among a primary care practice that employs multi-disciplinary providers.

Define

Appling the Six Sigma DMAIC framework includes a five steps process. Under define, the problem is identified, expectations are set and it is the first phase of the process improvement initiative (Moran, Burson, & Conrad, 2014). It is defined and identified that research has yet to discover a primary prevention for breast cancer, it is conclusive that the risk of death from breast cancer can be reduced by regular breast cancer screening (American Cancer Society, 2015).

Therefore, breast cancer screening improves earlier detection of the disease. By implementing a breast screening protocol for the providers, it will potentially help identify and minimize the detrimental effects of breast cancer in women in this project site. The project lead defines the problem, participants, purpose, objectives, stakeholders and potential plan for improvement at this project site.

Measure

The measure stage is where defects are defined, goals are established, and data is collected to identify the current processes in comparison with the standard of care (Moran,

Burson, & Conrad, 2014). In this stage, reliable tools will be utilized to determine if outcomes are met providing a scientific underpinning.

The measure stage of the project includes tools to evaluate the breast screening process such as data collection from the clinic's database used by the clinic's providers, interviews with the staff to determine knowledge, skill and attitudes (KSA), observation of the workflow in the clinical setting, and chart audit to have a base measurement to which future measurements can be compared and used to determine the factors that have influence concerning the outcome of the process.

Analyze

Under analyze, gaps are identified between the current and goal performance (Moran, Burson, & Conrad, 2014). Therefore, the analyze stage of the project includes measuring the data collected prior to the implementation of the new process and compare it after implementation. Appropriate statistical testing will be utilized to ensure data are measured appropriately. This process encompasses realizing why deficiencies are produced and analyze the reasons for errors that need to be corrected which are apt to generate process variation (Lean Six Sigma Methodology, 2018). Thus, this process will identify any variables, deficiencies and flaws that would need to be improved upon and analyze patterns regarding barriers to breast cancer screening.

Improve

The improve stage is where innovative solutions are created and implementation is initiated (Moran, Burson, & Conrad, 2014). The define, measure, and analyze stages of the process will established the underpinning for the improve phase of the project. The process improvement interventions specific to the breast-screening protocol will not be recognized prior

to the completion of the initial steps of the process. The improvement tenet will lay the foundation for the organization to adopt the new process as a practice change.

During the improve stage collaboration with the stakeholders will be necessary to determine ground-breaking new processes. The analysis of the current process will be tested, and synthesis of the evidence will yield the process improvement. After defining the problem and determining the outcome measure, the evidence will be comprehensively reviewed for the best available strategies and interventions to improve the breast cancer screening process.

Control

The control stage consists of policies that are put in place to ensure success. The control stage outlines how to maintain improvement without reverting to the former procedure (Moran, Burson, & Conrad, 2014). The purpose of this stage is to utilize the tools to ensure the practice is sustainable and variables stay within the established range of acceptability (Moran, Burson, & Conrad, 2014). Therefore, the creation of a policy and procedure that will close the gap should be considered to ensure current standards of care. Moreover, outcomes will continue to be monitored to ensure ongoing progress.

By using DMAIC framework and having an organizational planned objective will aid in directing and determining critical aspects and components for the future implementation of this project. Furthermore, this framework will guide practitioners and give greater emphasis to the importance of distinct contexts related to screening protocol for breast cancer in this outpatient primary care clinic.

Project design

According to Nardi and Diallo (2014), due to both growth and progression, nursing research has simultaneously widened its targets and sharpened its focus on the outcomes of healthcare design, delivery, and education. A detailed outline of the project design will allow for future interventions that can be replicated. The DMAIC framework will provide structure for this quality improvement project. The intervention will include a process change. The outcome will be evaluated prior to the process change and after the process change.

The project design will include an implementation of a protocol to increase adoption of breast cancer screening by the primary care providers. Data collection will include administration of a survey and utilization of chart audits. A survey tool will be used during both the pre- and post-testing as the data collection tool. Basic descriptive statistics and Wilcoxon Signed Rank will be used to evaluate the results of the survey tool.

The Wilcoxon Signed Rank is designed for use with repeated measures; when the participants are measured on two occasions, or under two different conditions (Pallant, J. (2013). The Wilcoxon Signed Rank will be suitable to evaluate the outcomes of the intervention as this nonparametric alternative to the repeated measures t-test compares pre-test/post-test results at Time 1 and Time 2 (Pallant, J. (2013). This project design will accomplish the project objectives by implementing and assessing qualitative data regarding provider's perceived understanding of and adherence to current guidelines, as well as barriers to successful implementation of recommended screening practices.

The pre-test/post-test results will be used to evaluate the education tool intervention and the effectiveness of providers' use of the recommendations in practice. Therefore, the participants will complete the pre-and post-test and the results will be determined by comparing

the pre- and post-test results of the understanding on how providing the recommendations of breast cancer screening guidelines and reviewing the specifics within the guidelines, would impact the providers' recommendations within clinical practice.

Population of Interest

The population of interest for the DNP project are the providers at the practice site. The providers will implement the intervention which includes the breast cancer screening protocol. The inclusion criteria are the licensed professionals at the practice site. The licensed professionals include all licensed physicians (MDs) and 3 nurse practitioners (masters prepared NPs) with specialty training and credentialing in family practice, general medicine, internal medicine. Exclusion criteria are the staff not licensed or certified to perform breast cancer screening under the license of the professional scope of practice (i.e. office or nursing staff, medical assistants). The population of interest will be selected given the nature of the project's scope and convenience of the providers at the practice site.

Stakeholders

The stakeholders for the DNP project include the practice site administrator. Permission from the practice site administrator will be obtained to implement the project intervention at the site. In addition, other stakeholders for this project include all the providers and staff at the practice site. The engagement of key stakeholders is vital for the success of this project. Needed resources for this project include the participation and support of the employed providers at the practice site.

Recruitment methods

Collaboration with the practice mentor and content expert will be used to develop the strategies for the process change aimed to improve breast cancer screening protocol. There will be no advertisements and incentives used in this project.

Recruitment for data collection for this project will include chart review using the diagnosis code of screening for malignant neoplasm of breast. Participation will include the providers at the practice site and formal meeting times will be made between each participant and the project lead to educate each on the project intervention. It is a shared belief of many practice providers in the project site that current breast cancer screening guidelines for women are ever-changing and many felt it difficult to stay abreast of new information and modifications of such guidelines. Some of the providers acknowledged familiarity with the current guidelines but frequently needed to refer back to the guidelines to be sure current screening recommendations were being followed.

The providers at the practice agreed that this project could help to improve performance and positively influence office visits with female clients requiring appropriate breast cancer screening, while remaining relatively cost and time neutral for the entire practice. It is the hope that this project will improve screening practices and performance of providers and become part of the overall provision of care and comprehensive services delivered to women in applicable age groups at this primary care internal medicine practice.

Tools/Instrumentation

Tools and instrumentations that will be utilized in the evaluation of this project will include a computer system application that keeps track of providers screening assessment, an educational presentation about use of the breast screening protocol, and a pre and post survey tool for the screening protocol training.

This project will include a pre and post survey tool that will be developed by the project lead and will assess and re-assess provider understanding of current breast cancer screening guidelines and provider recommendation for ongoing breast cancer screening.

The pre and post survey tool will include a survey that will be used as a part of the educational intervention to examine provider recommendations for breast cancer screening. In addition, this survey will include clinical vignette-based pre-test questions to assess the provider knowledge. Upon completion of the questionnaire a discussion of 10 to 15 minutes will follow between the participant and the project lead regarding the review of a printed educational handout referencing the current best practice of breast screening according to nationally recommended clinical practice guidelines. This review and discussion will then be followed by a subsequent post-test.

A CVI calculation tool will be used to evaluate item development of questions and will include expert rating scores to determine validity of the questions. The CVI tool will be completed by the course instructor, academic mentor, and the project mentor as these individuals have knowledge of the content and the project.

According to Polit and Beck (2006), the most widely reported measure among nurse researchers is the content validity index (CVI) which has been used for many years and is most often attributed to an education specialist Victor R. Martuza. Scale developers often provide

evidence of content validity by CVI, using ratings of item relevance by content experts (Polit and Beck, 2006). The CVI tool has been used in methods of quantifying experts' degree of agreement regarding the content relevance of an instrument such as averaging experts' ratings of item relevance and using a pre-established criterion of acceptability (Beck and Gable, 2001).

Data collection Procedure

Data collection regarding provider's perceived understanding of and adherence to current guidelines, and barriers to successful implementation of recommended screening practices, will be collected during one-on-one meetings between the providers and the project lead while accounting for privacy and confidentiality issues. This will aid the providers to make logical inferences from project results, while also helping to identify obstacles to project sustainability.

The content will include the generation of inferences from communication during one-on-one meetings with participants and it will also be used to outline common factors essential to effective breast cancer screening guideline use in primary care practice. The variables that will be assessed during data collection is provider's identification and management of women at risk for breast cancer, providers adhere to breast screening protocol and knowledge related to breast screening, and provider's evaluation of risk assessment and evaluation on patients regarding breast cancer screening.

The chart review process will be done within a 3 weeks period and then followed by a 6 weeks period after implementation. A minimum of 20 charts will be audited to assess providers compliance with the breast screening process. The data will be collected to determine whether the project outcomes have been met. It is hoped that the outcome will show an increased knowledge of breast cancer screening by the providers. The outcomes will be based on responses to the survey.

The Wilcoxon Signed Rank is designed for use with repeated measures; that is, when the participants are measured on two occasions, or under two different conditions (Pallant, J. (2013). The Wilcoxon Signed Rank will be suitable to evaluate the outcomes of the intervention as this nonparametric alternative to the repeated measures t-test compares pre-test/post-test results at Time 1 and Time 2 (Pallant, J. (2013).

Intervention Timeline

A quality improvement (QI) project design using provider education, clinical practice guidelines, and evidence-based patient education to improve the quality of standard of breast screening management will be delivered in one primary care practice. Data will be collected from provider survey, and communications between providers and patients. The activities will include educational sessions at staff meetings, as well as one-on-one provider and staff education. The interventions will include provider education and completion of survey, data collection and evaluation of the project. In addition, the timeline will include the following activities: confirming final date of the implementation at the site, and recruitment of participants.

In order to stay on course for timely completion of this quality improvement (QI) project, an initial timeline has been developed for pre-planning stages as a representation of specific dates, time spans, and sequence of events in planning, initiating, sustaining, and evaluating this breast screening protocol project.

Timeline of Actions

The projected timeline and actions to complete will be as following:

a. Week 1 November 7-13, 2018: Project proposal formulated (beginning phases), materials will be prepared (i.e., both pre- and post-tests questions, educational

handout), chart audit initiated to collect pre-implementation data. Remind all participants of educational session date and time via email.

b. Week 2 November 14- 20, 2018: Participants will be recruited. Data gathered each day and at the end of the week. This information will be compared to week 1. Meeting with stakeholders where protocol will be put in place. Pre- examination administered to participants. Education session performed. Post-examination administered.

c. Week 3 November 21- 27, 2018: Meeting with clinic management, practice manager, and project mentor to provide in-depth review of project plans. Metrics will continue with data and gathered each day and at the end of the week to continue to compare timeframes with a pre-implementation.

d. Week 4 November 28- December 4, 2018: Data metrics, evaluating if any changes were made in week three from the information gathered from week two. Impact program will be made such as pre-testing, educational intervention supply to participating providers, post-testing, debriefing during one-on-one meetings with participating providers, data collection will be completed. To aid in the presentation of the EBP project, a teaching plan will be made so that it would be known in advance what content will be presented and how long it will to take to deliver the message.

e. Week 5 December 5- December 11, 2018: In depth data analysis following project data collection to assess provider knowledge and awareness of breast cancer screening.

f. Week 6 December 12- December 18, 2018: Data will be compared each week. Data was then placed into a Wilcoxon Signed Rank test, which is a test that utilizes an intervention to prove the analytical statistics. Written (QI) project evaluation and interpretation of findings submitted to Touro faculty and practice site providers.

The complete timeline for the implementation of this project from start to finish will be November 7, 2018 through December 18, 2018. Benefits of the timeline will include its utility as a communication tool for conveying responsibilities and deadlines, as well as keeping activities coordinated and within sequence and allowing for communication of accountability for assigned actions to complete, while helping to estimate personnel and material costs (Issel, 2004). It also will serve as a guide and frame of reference so that the DNP project will be successfully completed.

Ethics/Human Subjects Protection

This DNP project is a quality improvement (QI) initiative, therefore the project leader will submit IRB determination forms per TUN policy and the expectation is that the project will fall under the category of TUN Quality improvement project and would not require an IRB review. In addition, the project poses minimum risks to the participants. Moreover, it is anticipated that the project site will consider the DNP project a quality improvement project and that the project would not require an IRB review. The providers will be the participants in this DNP project and there is no direct patient care contact by the project leader. Rather the patient is secondary to the outcome and the providers will be implementing the intervention in this project.

There are minimal risks to the project participants, meaning that the physical or psychological harm anticipated in the project are not greater than ordinarily encountered in daily life. The identification of the participants will remain confidential and non-identifying numeric codes will be used when completing project survey, pre and post- tests, and patient information.

All participants and patient information will be protected by the Health Insurance Portability and Accountability Act of 1996 (HIPAA) which protects the privacy of patients' health information (Modifications to the HIPAA Privacy, Security, Enforcement, and Breach

Notification Rules, 2013). In addition, the project leader and all participants will be following the standards of care for practice in a primary care office. All information collected as part of evaluating the impact of this project will be aggregated data from the project participants and will not include any identifiers.

Plan for Analysis/Evaluation

This DNP project will be using both quantitative and qualitative data in the evaluation and reporting of the findings of this quality improvement project. The use of quantitative and qualitative date will assist in maximizing the strengths and the weakness of the data collection (Creswell, Klassen, Plano Clark, & Smith, 2011). The qualitative data will be collected and evaluated from provider interviews, and observations. The quantitative data will be evaluated from the survey responses which will be used during both pre- and post-testing using Wilcoxon Signed Rank to evaluate the outcomes of the intervention.

The initial evaluation of results will include an analysis of the impact of this project intervention based on the defined goals and outcomes. The impact will be shown as the percentage of impact. The impact of the evaluation will include:

- Provider demonstration of increased knowledge of breast cancer screening based on responses to questions; and
- Provider reporting the educational programmatic intervention supplied during the project useful in improving standards of care.

Quantitative data analysis for this project will be consisted of calculating the percentage of correct answers from each pre- and post-breast cancer screening guideline based on the educational intervention included in the project. Individual and group mean scores will be calculated and compared both within and between pre- and post-testing.

Following the implementation of the intervention of discussing and reviewing the educational handouts with participants along with one-to-one interviewing of each participant by the project lead, providers will complete a post-test survey. Group means of both pre- and post-test findings will be compared to evaluate the influence of the intervention and determine provider knowledge of breast cancer screening guideline recommendations.

Significance for Nursing

The significance and implication of this project for nursing is to assist in expanding the standards of care to improve provider adherence to breast screening practices while emphasizing efforts to close the gaps associated with conceivable barriers. This project will provide meaningful evidence and recommend specific changes that may be considered to increase provider use of recommended breast cancer screening protocols. In addition, the providers will gain an understanding of using current breast screening recommendations and will be aware of significant barriers that may existent in current practice and culture.

Moreover, the Task Force on Community Preventive Services [USPSTF] (2012), systematically reviews the evidence of effectiveness and develops recommendations for clinical preventive services. The USPSTF (2012) has established several evidence-based strategies to increase breast cancer screening such as outlined tailored reminders that address the individual's risk profile or other relevant characteristics, such as assessing barriers to the client seeking screening or facilitators to encourage the client being screened.

The USPSTF (2012) also recommended one-on-one education and motivational messages with strong evidence of effectiveness. The educational strategy can be tailored to reach a target population or untailored for the general population. Studies have found that

patient-centered provider recommendations and education correlate with mammography adherence (USPSTF, 2012).

According to Peterson, Ostroff, DuHamel, D'Agostino, Hernandez, Canzona, & Bylund, (2016), effective communication correlated with positive patient influences and increases health literacy. In addition, communication and the sharing of information between individuals, has a significant association with adherences, and thus is essential to health outcomes (Nouri & Rudd, 2015).

Health providers and patient-centered education are relevant to breast screening. Moreover, the reporting of signs and symptoms of breast abnormalities may lead to early detection of breast cancer and contribute to patient survival outcomes. The hope for this DNP project is that by using the breast screening protocol the practice site will have a significant improvement of breast screening uptake. Hence such results would indicate the importance of continued use of the implemented breast screening protocol.

Data Analyses

The evaluation of results included analysis of the percentage impact of this project intervention based on the defined goals and outcomes. This quality improvement project included the successful recruitment and evaluation of six providers participating in the project and provider demonstration of increased knowledge of breast cancer screening based on responses to pre- and post-questionnaire of the educational programmatic intervention supplied during the project. There were six providers that participated in the educational session and all six completed the surveys (n=6). The results, represented below in (Table 1), meet the project projected outcome expectation of a 100% recruitment and participation rate for this project.

Table 1

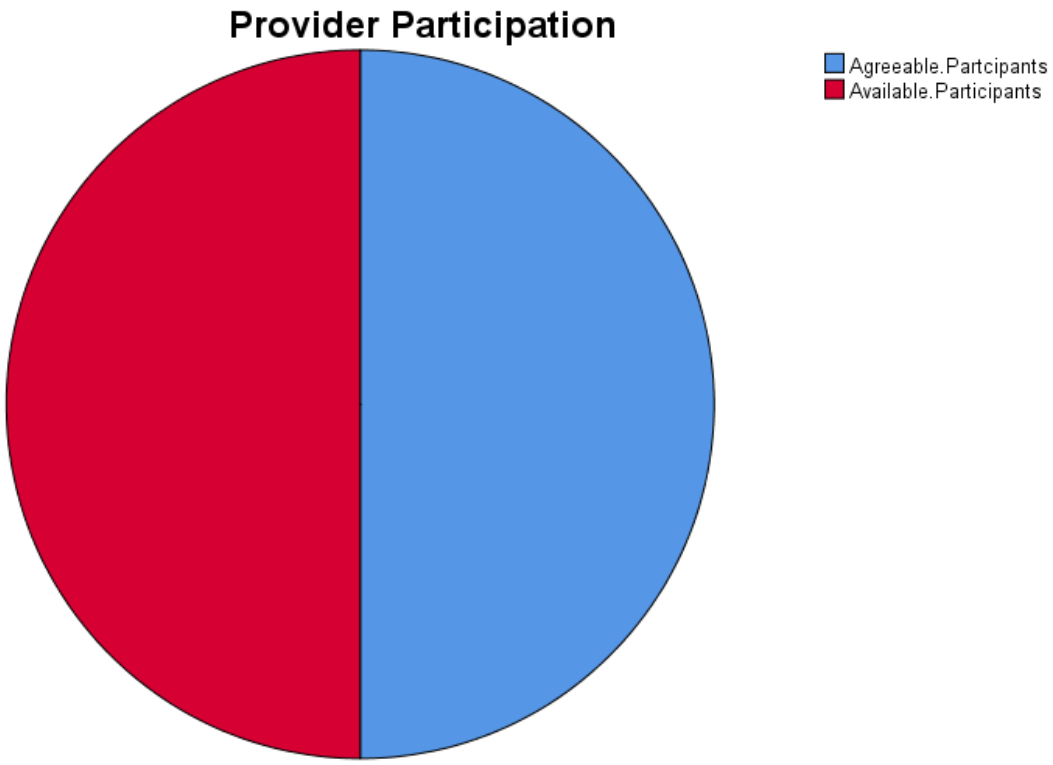

Table 1. Pie graph representation depicts provider participation in quality improvement project.

The data was analyzed based on Wilcoxon Signed Rank Test. This test was appropriate because the participants were measured on two occasions, pre- and post-questionnaire (Pallant, 2013). Non-parametric testing was chosen over parametric testing because the data to be collected mostly are ordinal scales and the population involved is quite small. Social Sciences Statistical Package (SPSS) was used for data entry and analyses into the Microsoft Excel program. To compare the intervention process for providers, the data was evaluated from the survey responses both pre and post implementation. The Wilcoxon Signed Rank test was used for the categorical variables to evaluate the outcomes of the intervention. Individual and group mean scores were calculated and compared both pre and post implementation. Data analysis for this project consisted of calculating the percentage of correct answers from each of the pre- and

post-questionnaires related to breast cancer screening guideline based on the educational intervention in this project.

Prior to the education implementation, each provider was asked to independently complete the pre-test questionnaire which included a total of 10 questions. Following the discussion and the review of the educational materials with the providers, and the one-to-one interviewing of each provider by the project leader, providers completed the post test - questionnaire. The results included a comparison of the pre and post-test questions, a p-value of <0.05 was used to indicate statistical significance. The intervention resulted in a significant change in pre and post-test scores.

The results showed that there were six providers, with zero cases of negative ranks meaning the post-test implementation had higher scores (improvement in providers knowledge after implementation), compared to pre-test implementation. There were six providers with positive ranks meaning provider's knowledge had lower scores compared to the post-test implementation. The pre-test score of provider demonstration of knowledge of breast cancer screening competency showed a mean score of 3.50 pre-test and .00 score post-test (see Table 2). A Wilcoxon Signed Rank test revealed that the increase in providers' knowledge after the program implementation was not statistically significant, z = -2.226, p= .026 (2-tailed) (see Table 3).

Table 2

Ranks

		N	Mean Rank	Sum of Ranks
Postest - Pretest	Negative Ranks	0[a]	.00	.00
	Positive Ranks	6[b]	3.50	21.00
	Ties	0[c]		
	Total	6		

a. Postest < Pretest

b. Postest > Pretest

c. Postest = Pretest

Table 3

Test Statistics[a]

	Postest - Pretest
Z	-2.232[b]
Asymp. Sig. (2-tailed)	.026

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Post-test results demonstrated 100% accuracy of participating providers. This included six providers that demonstrated having mastered best practices of breast cancer screening recommendations based on responses to the pre- and post-questionnaires. Table 4 and 5 below depict pre- and post-test results.

Table 4

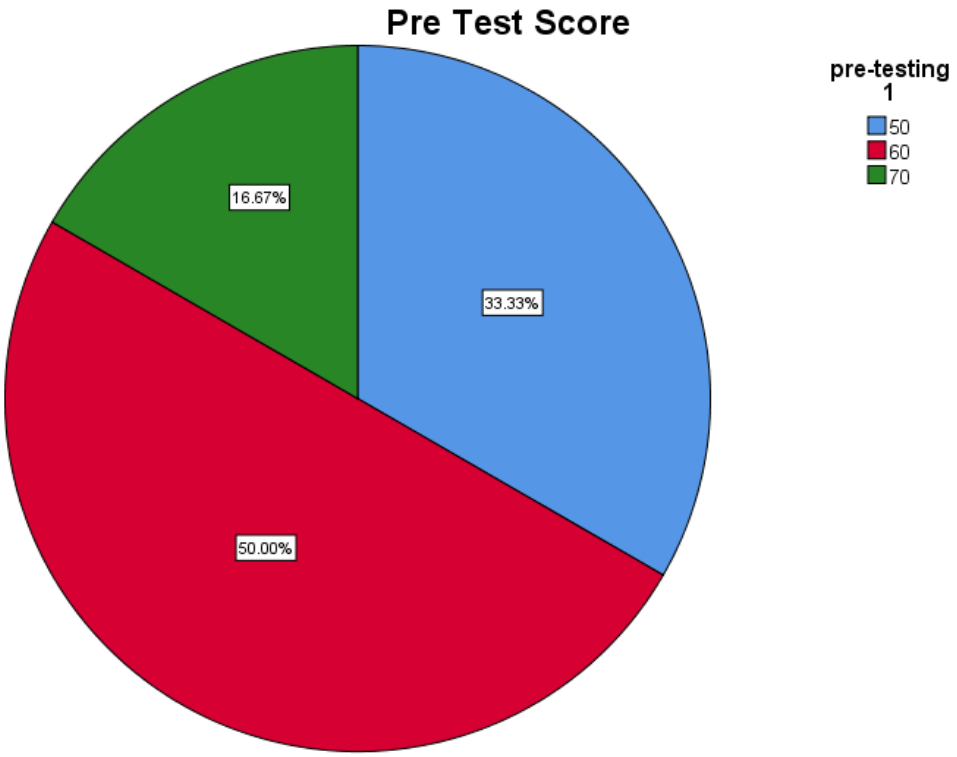

Table 4. Pre-test scores show provider's understanding to guidelines prior to education intervention.

Table 5

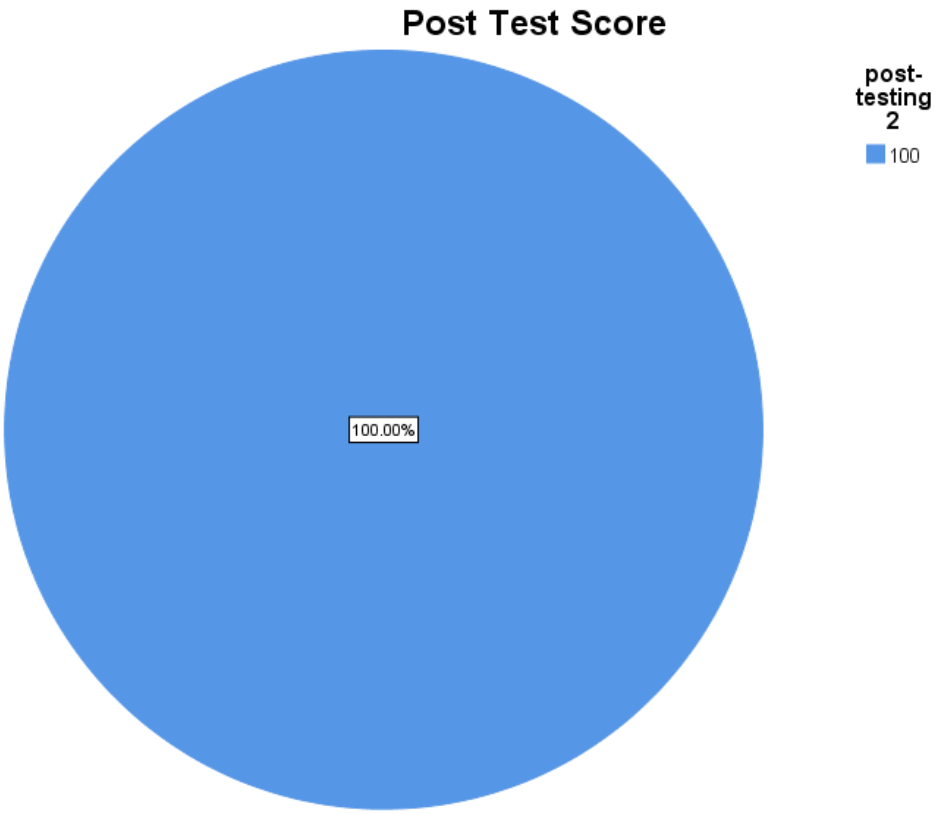

Table 5. Post-test scores show provider's knowledge to guidelines with education intervention

In the pre-implementation process, 30 charts were evaluated and compared to the post implementation process with the similar distribution of patients among the providers to measure adherence to protocol through chart audits. The implementation of the breast screening protocol led to a significant improvement of the providers adherence to the protocol post -implementation. Wilcoxon Signed Rank test revealed that the increase in providers' knowledge after the program implementation was not statistically significant, z = -2.207, p= .027 (2-tailed) (see Table 6).

Table 6

Ranks

		N	Mean Rank	Sum of Ranks
Postest - Pretest	Negative Ranks	0[a]	.00	.00
	Positive Ranks	6[b]	3.50	21.00
	Ties	0[c]		
	Total	6		

a. Postest < Pretest

b. Postest > Pretest

c. Postest = Pretest

Test Statistics[a]

	Postest - Pretest
Z	-2.207[b]
Asymp. Sig. (2-tailed)	.027

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Discussion of the Findings

The breast cancer screening protocol for health care providers was successfully implemented in the outpatient primary care clinic. There is a total of six providers that are responsible for patient care. All six providers received the educational program intervention. Based on the analysis of the data collected using the Wilcoxon Signed Rank Test, the results revealed that the increase in providers' knowledge after the educational program implementation was not statistically significant (p= .026). The post-test results demonstrated 100% accuracy of providers participation. Group mean of pre- and post-test questionnaires were compared to evaluate whether the implementation positively influenced and helped to affirm provider's knowledge of breast cancer screening guideline recommendations. The score of the provider demonstration of knowledge of breast cancer screening competency showed a mean score of

3.50 pre-test and .00 score post-test. The decrease in scores was not statistically significant based on the calculation of the Wilcoxon Signed Rank Test. An explanation for a nonsignificant result could be attributed to the fact that the sample size was small.

Moreover, the improvement in patient outcomes were evaluated and compared to the post- implementation process among the providers to measure adherence to protocol through chart audits. Based on the analysis of the data collected using the Wilcoxon Signed Rank Test, the results revealed that the implementation of the breast screening protocol led to a significant improvement of the providers adherence to the protocol post -implementation ($p = .027$). The success of the project was determined by comparing pre-test and post-test results to provider use of the recommendations in the breast cancer screening protocol. Additional successes of the project included the review of the specifics within the guidelines that impacted the providers' self-reported actions to use the recommendations and protocol within clinical practice. Providers reported the educational programmatic intervention supplied during the project was useful in improving standards of care. In addition, the providers mentioned the protocol will improve early identification and management of women at risk for breast cancer; and will serve as a guide to identify patients that need breast screening with and without chief complaints and recognize patients that needs referrals. The results of the project align with previous published literature and was evident that the implementation of the breast screening protocol was proven to improve providers knowledge and adherence to the protocol.

Significance to the Nursing Profession

The significance to the nursing profession for this project is to help expand standards of care in this outpatient care clinic. Moreover, the significance of the analysis of this DNP project is to impact the patient care as the nursing profession must respond to the changes in the patient population and provide care that is perceived by the patient as caring. In addition, the providers relate to the need to improve adherence to breast cancer screening protocol practices while emphasizing efforts to close gaps associated with conceivable barriers to the uptake of such recommendations. One primary goal of Healthy People 2020 is to reduce the number of new cases of cancer, illness, death, and disability that results from cancer (Healthy People, 2015). This culturally sensitive breast cancer screening protocol is intended to improve early identification and management of women at risk for breast cancer. In addition, this project provided meaningful evidence into specific changes that should be considered to increase provider adoption of recommended breast cancer screening protocol.

Providers that are provided educational interventions planned for patient use, can play an integral role in promoting teaching, awareness, and improving educational strategies to enable changes and patient ways of thinking in regard to breast cancer screening. In addition, the breast screening protocol will help providers by guiding provider identification of patients that need breast screening and referral to a breast surgeon, breast specialist, and genetic counseling. Anderson and Hoskins (2012) state “surveillance and primary prevention adapted to each patient’s individual risk level may be the most effective use of resources for preventing, detecting and improving breast cancer survival” (p. 2). Moving towards helping more women at risk for breast cancer and providing necessary treatment is important to the nursing profession.

Thus, the nursing profession, patients, family members, and the clinic will benefit with this breast screening protocol.

Limitations

There were several limitations that were encountered during the implementation process. One limitation was communication regarding the providers' schedule. On the second week of the project, one of the providers was scheduled to leave early. This was not communicated to the project leader by the manager or the provider prior to implementation. The project leader negotiated with the manager to reschedule on that week the pre- examination to providers, education session and post-examination. The project leader successfully rescheduled and administered the pre and post-examination and education session.

Project Design

The project was designed for quality improvement using a pre and post-questionnaire following the implementation. Due to the timeframe of the project, retention, recall, and application of the education components would benefit to a longer monitoring and evaluation between pre and post-testing to further its significance during the implementation period. The weekly group meeting with the providers, manager, and the project leader was not followed accordingly due to the circumstances of the outpatient clinic. The project leader visited the providers and manager late in the afternoon to avoid conflict of provider/patient scheduled. There were several weekly meetings with providers that were rescheduled due to the influx of patients. The purpose of the weekly meeting was to meet as a group, and provide progression of the project, and to share feedback.

Data Recruitment and Collection Methods

This project utilized the convenience sampling of six providers that are responsible for patient care. At the time of the project implementation, the project leader negotiated with the manager to reschedule the providers certain days prior to implementation. Certain providers preferred to work morning while others preferred to work in the afternoon. This limited access to resources that are available during the group meeting. In addition**,** given unforeseen circumstances involving changes to provider scheduling and availability of practice's conference room, the implementation strategy of the project was sometimes modified from using a group method to approach each provider individually during their participation in the project.

Data Collection Methods

The small number of providers for the pre and post-education questionnaires was a limitation. Since the sample size was small, a nonparametric statistical formula was utilized. In addition, the sample size may have limited the ability to detect the statistically significant differences in the pre and post- implementation timeframe. Data was analyzed using SPSS but could easily have been reported using simple descriptive statistics and measures of central tendency. The use of software programs such as SPSS and Microsoft excel was a possible limitation to the project again due to the very small sample size.

Dissemination

The project findings were of interest to the practice site and to the project leader. The result of the project will be disseminated through a PowerPoint presentation to the stakeholders at the project site in a future staff meeting. The project leader has a professional responsibility to share the project with participants of the project. The project leader will continue to disseminate the project findings into the Harlem and Brooklyn community. Therefore, in addition to the

project site, the project leader plans to provide a PowerPoint presentation to additional facilities which provide screening for breast, cervical and colon cancer such as Breast Examination Center of Harlem in April/2019. Lastly, the project leader plans to submit the completed project on dnpprojects.org, and to have a poster presentation at the 4th World Congress on Nursing Education & Research on April 12-13, 2019 at Toronto, Canada.

Sustainability

As a result of the project the providers at the practice site made a decision to adopt the breast cancer screening protocol. The providers were given educational intervention at the beginning of the implementation phase in anticipation of the project sustainability. In addition, the providers reported the educational programmatic intervention supplied during the project useful in improving standards of care and positively impact the patients. Furthermore, the project leader is willing to support and will serve as a consultant at the practice site.

Conclusion

Provider understanding about the early identification and management of women at risk for breast cancer and the use of a breast cancer protocol will help expand standards of care. The main goal of this project includes that the providers improve patient outcomes by implementing breast cancer screening among eligible patients who agree to planned screening, and successfully communicate guideline to patients in layperson terms to facilitate patient acceptance and practice adoption. The implementing of this project shed light on how important it is for patients to be aware of breast cancer screening updates just as much as providers, so that both parties can continually function as joint and integral parts of the patient's collaborative and comprehensive health care.

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Appendix A: Breast screening protocol/education projects

This protocol is focused on a project in which a group of practitioners who are responsible for care are educated. The improvement in patient treatment/outcomes is then assessed from a chart review. The protocol is a culturally sensitive breast cancer screening to improve early identification and management of women at risk for breast cancer and will serve as a guide for provider to identify patients that need breast screening with and without chief complaints; define what is a breast screening protocol; describe the breast screening process; recognize abnormal breast signs/symptoms that will require immediate healthcare provider attention, and recognize patients that needs referrals.

Project design: This type of design has two phases and correspondingly two populations of interest. The phases are treated separately below.

Phase I. Educate/Implement the program

Population of Interest: the practitioners being educated

Variables: Before/after intervention survey scores. Both the program presented, and the instrument used to collect information should be validated. The program and instrument should be reviewed by a couple of knowledgeable individuals to make sure the information therein is complete (content validity), relevant, and correct.

Analysis: A paired t-test or Wilcoxon test comparing before and after scores.

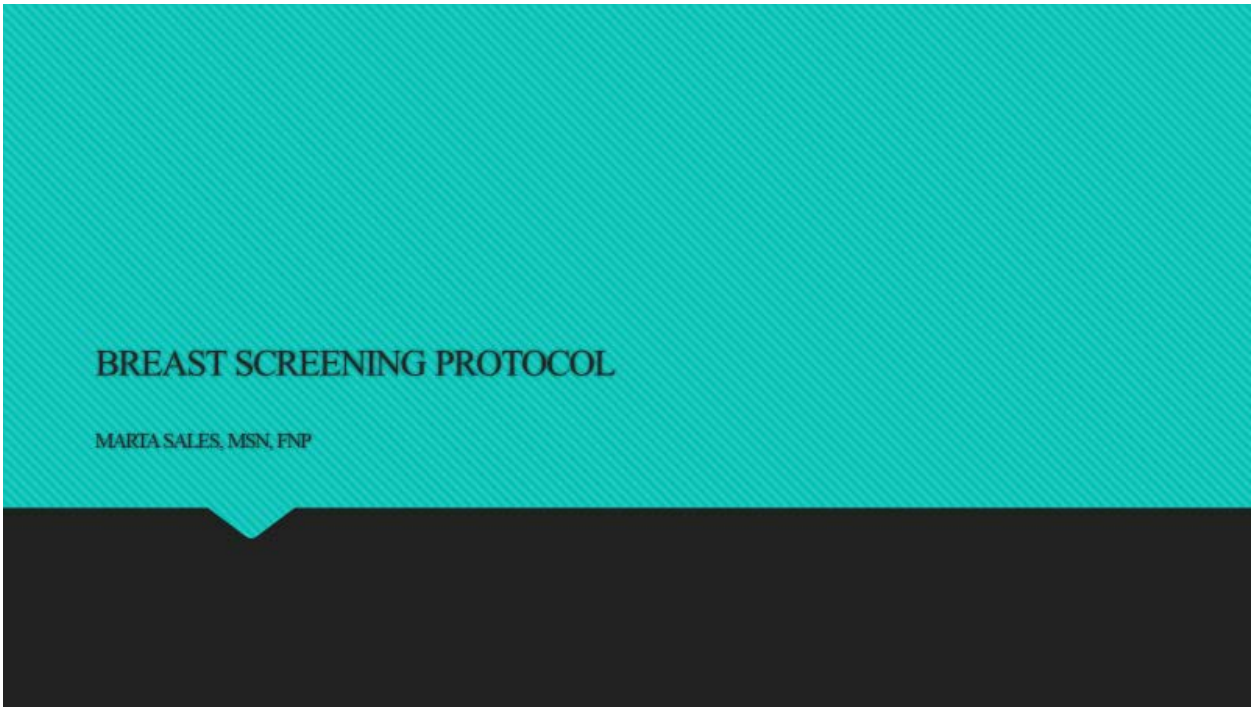
Phase II. Measure impact on patients through chart review

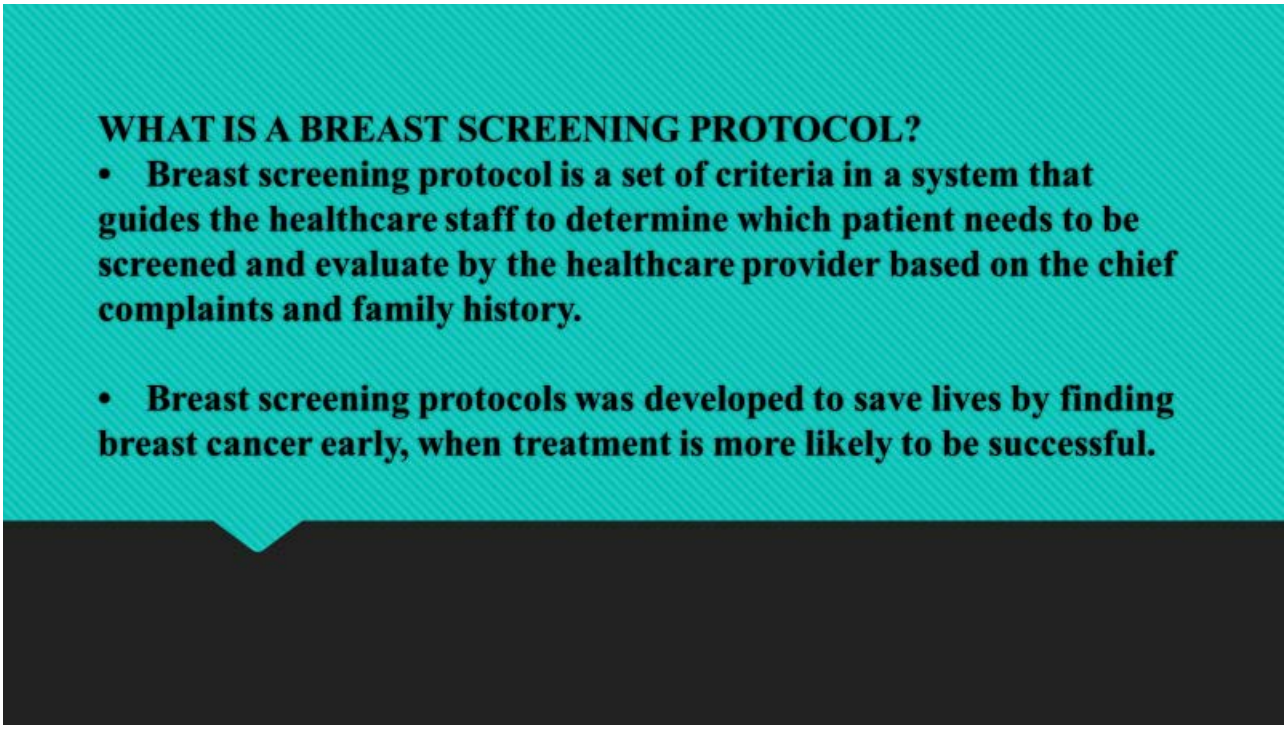
Population of Interest: patients

Variables: Before/after intervention referrals/outcomes.

Analysis: A paired t-test or Wilcoxon test comparing before and after scores.

Appendix B: Educational Presentation for Breast Screening Protocol





Why women should be screened for breast cancer?

- **Breast Cancer is the most commonly diagnosed cancer in women regardless of age or ethnicity, and the second most common cause of cancer death.**
- **It is a worldwide problem affecting millions of people each year. According to the Centers for Disease Control and Prevention, breast cancer rates vary by ethnicity. The risk of developing breast cancer is about 12% in any woman's lifetime.**

Why it is important to know the family history and type of cancer of a patient's family had?

- **Breast cancer often spreads to the bone. It would be very important to know whether this clients mother had breast cancer because a genetic component is associated with it.**
- **Asking about other family members who have had bone cancer may give the provider useful information but would not be as important as finding out about other cancers, specifically breast cancer and ovarian cancer.**

Should a genetic testing be ordered to all patients that requested it because of a family history of cancer?

- **According to the Centers for Disease Control and Prevention, some women have risk for breast cancer due to a combination of factors that are both modifiable and non-modifiable.**
- **Genetic testing for the risk of developing a few specific cancers is an expensive test that few insurances might pay for it. The provider should first assess the client's family cancer history by creating a three-generation family tree.**
- **If the client does have a strong family history of cancers with a genetic component, the nurse can facilitate testing for the client. Teaching the client to reduce risk is always important, but simply telling the client about the expense involved in testing belittles the client's concerns.**

What should be assessed when considering risk for breast cancer?

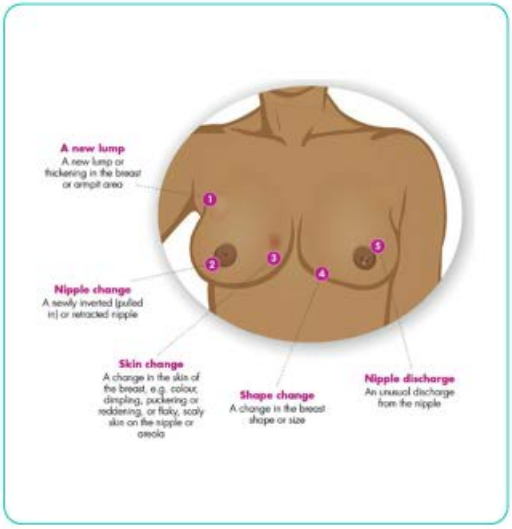
- **According to the Centers for Disease Control and Prevention, some women have risk for breast cancer due to a combination of factors that are both modifiable and non-modifiable.**
- **There are severable non-modifiable risk factors such as; getting older, as most breast cancers are diagnosed after age 50, inherited genetic mutations to certain genes such as BRCA1 and BRCA2, early menstrual period before age 12, late pregnancy after age 30 or no pregnancy, having dense breasts, personal history of breast cancer, personal history of certain non-cancerous breast diseases, family history of breast cancer, and starting menopause after age 55.**
- **Advancing age is the single most important risk factor for cancer because of age-related decline in immune function and accumulated exposure to carcinogens.**

Why it is important to develop a culturally sensitive breast cancer screening protocol to improve early identification and management of women at risk for breast cancer?

- **Anderson and Hoskins pointed that despite the decrease of annual death rates from breast cancer since 1991, significant racial and ethnic disparities exist in breast cancer morbidity and mortality.**
- **African Americans, for instance, have higher incidences of lung, prostate, breast, colorectal, and uterine cancers than are seen in the general population.**

What are the signs of breast cancer?

- **According to American Cancer Society, the warning signs of cancer include changes to the skin of the breast. These can include any change in color such as the breast may look red or inflamed and any change in skin texture such as puckering or dimpling of the skin of the breast.**
- **Lump(s) in the breast such as either in the breast, upper chest or armpits. Change in the appearance of the nipple such as one might become inverted (turned in) when it normally points out.**



How often should women check their breasts for possible signs and symptoms of breast cancer?

- **The American Congress of Obstetricians and Gynecologists, continues to counsel women that breast self-exam has the potential to detect palpable breast cancer and can be performed.**
- **They do not state how often, although traditionally it was recommended approximately once a month at the same time in your cycle, such 7 days after the period.**

Patient is concern she has breast cancer as she has chief complain of breast pain on and off for about 2 years. Should patient be concerned about breast cancer?

- **According to American Cancer Society, fibrocystic changes are diagnosed based on symptoms, such as breast lumps, swelling, and/or tenderness or pain.**
- **These symptoms tend to be worse just before your menstrual period begins and may change as you move through different stages of the menstrual cycle.**

continue…

- **Many women with fibrocystic changes have mild discomfort from fibrosis, and may get relief from well-fitted, supportive bras, applying heat, or using over-the-counter pain relievers.**
- **Some women report that their breast symptoms improve if they avoid caffeine and other stimulants found in coffee, tea, chocolate, and many soft drinks.**

When should a patient have her first mammogram?

- **The mammogram has been shown to be one of the best methods to reduce late detection of breast cancer (CDC, 2015).**
- **According to the Agency for Healthcare Quality and Research [AHRQ] (2014), the accepted best practice among the outpatient clinics is to screen for breast cancer every year starting at the age of 40.**

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Appendix C: Intervention Breast Screening Protocol

Purpose: The purpose of this protocol is to improve early identification and management of women at risk for breast cancer and guide provider identification of patients that need breast screening.

Objectives:

1. Describe the breast screening process;
2. Guide medical providers in recognition of abnormal breast signs/symptoms that will require immediate healthcare provider attention.
3. Guide appropriate identification of patients that needs referrals.

Indications:

A. Women are at average risk for breast cancer if they have:

- No symptoms of breast cancer
- No history of invasive breast cancer (breast cancer that has spread beyond the milk ducts)
- No history of ductal or lobular carcinoma in situ (abnormal cells that are confined to the milk duct, or lobule)
- No history of atypia (atypical hyperplasia, a form of benign breast disease)
- No family history of breast cancer in a first-degree relative (parent, sibling, or child)
- No suggestion or evidence of a hereditary syndrome such as a BRCA mutation (evidence would be multiple first- and/or second-degree relatives with breast cancer or ovarian cancer)

B. Women with a family history of breast cancer:

- A clinical breast exam every six months starting no later than ten years before the age of the earliest diagnosis in the family (but not earlier than age 25 and not later than age 40)
- An annual mammogram starting no later than ten years before the age of the earliest diagnosis in the family (but not earlier than age 25 and not later than age 40)
- Possible supplemental imaging (for example, with ultrasound) for women with dense breast tissue
- Patient should be referred to a genetic counseling and/or breast specialist

C. Women with abnormal breast signs/symptoms

- Women 40 and older should have an annual mammogram in addition to an annual clinical breast examination.
- Ultrasound and diagnostic mammogram may be recommended for women with abnormal breast signs/symptoms
- Patient should be referred to a breast specialist or breast surgeon for a possible biopsy

Contraindications:

- Women who are at average risk for breast cancer should have screening mammogram age of 40 and older only
- Screening mammogram starting no later than ten years before the age of the earliest diagnosis in the family (but not earlier than age 25 and not later than age 40)

Steps:

1. Follow screening and treatment guidelines according to risk categories.

A. Screening Guidelines for Women at Average Breast Cancer Risk

- Women between the ages of 25 and 40 should have an annual clinical breast examination.
- Women the age of 40 and older should have an annual mammogram in addition to an annual clinical breast examination.
- Ultrasound may be recommended for women with mammogram reporting very dense breast.
- All women should consider performing a monthly self-breast exam beginning at age 20 and become familiar with their breasts so they are better able to notice changes.

B. Screening Guidelines for Women at Above-Average Breast Cancer Risk

- History of breast cancer in a first-degree relative (parent, sibling, or child)
- History of atypical hyperplasia (a form of benign breast disease)
- History of lobular carcinoma in situ (abnormal cells that are confined to the milk duct, or lobule)
- genetic predisposition for breast cancer (for example, women with a positive BRCA mutation)

C. Guidelines for abnormal breast signs/symptoms:

- Any change in the size, shape or symmetry of her breast;
- A thickening or swelling of the breast;
- Any dimpling, puckering or indention in the breast;
- Dimpling, skin irritation or other change in the breast skin or nipple;
- Redness or scaliness of the nipple or breast skin;
- Discharge from the nipple (fluid coming from the nipples other than breast milk),
- Particularly if the discharge is clear and sticky, dark or occurs without squeezing the nipple;
- Nipple tenderness or pain;
- Nipple retraction (turning or drawing inward or pointing in a new direction);
- Any new lump or hard knot found in the breast or armpit;
- Any lump or thickening of the tissue that does not shrink or lessen after her next period;
- Any breast changes that may cause concern.

2. Based on the answers from the patient's medical history and chief complaints, and depending on the comfort level of the provider the patient:

- Will be referred to a breast surgeon, breast specialist, and genetic counseling

Or

- Will manage patient based on the breast cancer screening guidelines.

The protocol is a culturally sensitive breast cancer screening to improve early identification and management of women at risk for breast cancer. It is important for providers to be aware of the abnormal breast signs/symptoms as the patient may need to be referred for additional services.

Management Options for Breast Cancer Screening:

Screening Services for women are at average risk ☐ Clinical Breast Exam (CBE) ☐ Mammogram ☐ MRI ☐ Sonogram ☐ Monthly self-breast exam **Close Surveillance for women at Above-Average Breast Cancer Risk** ☐ 3 month follow up ☐ 6 month follow up ☐ Annual Follow up ☐ Monthly self-breast exam	**Risk Reduction Options and Referrals for abnormal breast finding and women at Above-Average Breast Cancer Risk** ☐ Lifestyle Modifications ☐ Genetic Counseling and Testing ☐ Breast Specialist ☐ Breast Surgeon Cadiz, et al (2013). Establishing a program for individuals at high risk for breast cancer. *Journal of Cancer, (4)* 1, 433-446.

Appendix D: Test Item Development

Purpose

The purpose of this education is to improve the outpatient primary care clinic staff's knowledge in recognizing patients who need to be screening by a healthcare provider by utilizing a breast cancer screening protocol. The course will also provide education on culturally sensitive practice protocol to increase breast cancer screening rates to potentially improve early identification and management of women at risk for breast cancer in an outpatient primary care clinic. It will also evaluate if the learners' knowledge improved their understanding of the breast screening protocol and its process (improved post-exam scores) after course completion.

Learning Objectives

Upon successful completion of this course, you will be able to:

- Identify patients that need breast screening with and without chief complaints
- Define what is a breast screening protocol
- Describe the breast screening process
- Recognize abnormal breast signs/symptoms that will require immediate healthcare provider attention.

Population

The population is the healthcare staff in the outpatient primary care clinic

Length of the Test

The optimum length of this test is 10 questions.

Difficulty and Discrimination Levels of Test Items

According to Oermann and Gaberson (2014), a criterion-referenced test is frequently used in clinical settings because it is used to measure set standards rather than the actual score

itself. Low level to moderate difficulty questions will be used since this test will be used for continuing education.

Scoring Procedures to be Used

The scoring will be done manually by hand. Basic math calculation will be used to perform the percentage score for each exam and then use again to calculate the overall percentage of the group.

Item Format

The test will be a selected response multiple choice format.

Appendix E: Test Blueprint

Content	**Level of Cognitive Skill**				
	K (Knowledge)	C (Comprehension)	AP (Applications)	AN (Analyzing)	Total
Define breast screening protocol	1				
Identify patients that need breast screening		1	1	1	
Describe the breast screening process		1	1	1	
Recognizing abnormal breast signs/symptoms			1	1	
Recognize abnormal breast findings that will require immediate healthcare provider attention.		1			
Total	1	3	3	3	10

Appendix F: Breast Screening Protocol Questions

1. A breast screening protocol (Select all that apply):

   a. Includes patients that need to be seen and treat for breast cancer by the healthcare providers

   b. Includes the chief complaint

   c. A system to detect patient risk of breast cancer

   d. A set of rules to assess patient's needs to be screened and evaluate by the healthcare provider

   Answer: A, B, C Knowledge

Rationale: breast screening protocol is a set of criteria in a system that guides the healthcare staff to determine which patient needs to be screened and evaluate by the healthcare provider based on the chief complaints and family history. Breast screening protocols was developed to save lives by finding breast cancer early, when treatment is more likely to be successful. According to American Cancer Society [ACS] (2015), advances in breast cancer treatment and screening initiatives have afforded significant declines in breast cancer mortality over recent years. Consequently, outpatient clinics started to utilize breast screening protocols to providers identify patients who needed to be screening sooner rather than later.

2. How many women in the Unites States will develop breast cancer in their life time?

   a. 2%

   b. 24%

   c. 50%

   d. 1%

   Answer: 12%

Rational: Breast Cancer is the most commonly diagnosed cancer in women regardless of age or ethnicity, and the second most common cause of cancer death (American Cancer Society [ACS], 2015). It is a worldwide problem affecting millions of people each year. According to the Centers for Disease Control and Prevention [CDC] (2015), breast cancer rates vary by ethnicity. The risk of developing breast cancer is about 12% in any woman's lifetime (Guimond, 2014).

3. A 40 years old female has a suspicious mammogram says that her mother died of bone cancer when she was around the same age. Which is the most important question for the provider to ask this client?

a. Have any other members of your family had bone cancer?
b. Did your mother ever have any other type of cancer?
c. How old were you when you started your periods?
d. Did your mother have regular mammograms?

Answer: B

Breast cancer often spreads to the bone (American Cancer Society [ACS], 2015). It would be very important to know whether this clients mother had breast cancer because a genetic component is associated with it. Asking about other family members who have had bone cancer may give the provider useful information but would not be as important as finding out about other cancers. Menstrual cycle and mammogram information also would not provide as relevant information as inquiring about other types of cancer, specifically breast cancer and ovarian cancer.

4) A client says that she has heard that the origin of most cancers is genetic and wants genetic testing because of a family history of cancer. What is the nurse best response?

a. I will ask your provider about a referral for genetic testing.

b. Let's look at your family history back to your grandparent's generation.

c. Genetic testing is so expensive; let's talk about reducing your risk instead.

d. Inherited cancers are much more common in males than in females.

Answer: B

According to the Centers for Disease Control and Prevention [CDC] (2015), some women have risk for breast cancer due to a combination of factors that are both modifiable and non-modifiable. Genetic testing for the risk of developing a few specific cancers is an expensive test that few insurances might pay for it. The provider should first assess the client's family cancer history by creating a three-generation family tree. If the client does have a strong family history of cancers with a genetic component, the nurse can facilitate testing for the client. Teaching the client to reduce risk is always important, but simply telling the client about the expense involved in testing belittles the client's concerns. Genetically related cancers are not more prevalent in men than in women, and again, this response belittles the client's concerns.

5) The nurse wishes to present a cancer program to a group of people at high risk for cancer. In planning the program, which group does the nurse consider the priority?

a. Older adults

b. People who smoke

c. Clients with family histories of cancer

d. People with poor immune function

Answer: A

According to the Centers for Disease Control and Prevention [CDC] (2015), some women have risk for breast cancer due to a combination of factors that are both modifiable and non-modifiable. There are severable non-modifiable risk factors such as; getting older, as most breast

cancers are diagnosed after age 50, inherited genetic mutations to certain genes such as BRCA1 and BRCA2, early menstrual period before age 12, late pregnancy after age 30 or no pregnancy, having dense breasts, personal history of breast cancer, personal history of certain non-cancerous breast diseases, family history of breast cancer, and starting menopause after age 55. Advancing age is the single most important risk factor for cancer because of age-related decline in immune function and accumulated exposure to carcinogens. All of the people listed are at some increased risk for cancer, but older adults have the highest risk overall.

6) In preparing a cancer risk reduction pamphlet for African-American clients, it is most important that the nurse include information on prevention and early detection for which types of cancer?

a. Lung and prostate
b. Bone and leukemia
c. Skin and lymphoma
d. Stomach and esophageal

Answer: A

Anderson and Hoskins (2012) point that despite the decrease of annual death rates from breast cancer since 1991, significant racial and ethnic disparities exist in breast cancer morbidity and mortality. African Americans have higher incidences of lung, prostate, breast, colorectal, and uterine cancers than are seen in the general population.

7. The nurse is seeing clients in a clinic. Which client does the nurse assess further for the development of cancer?

a. Lump(s) in the breast.
b. A change in the appearance of the nipple

c. Client with a 10-pound weight gain

d. Discharge from the nipple

e. Changes to the skin of the breast which can include any change in color such as the breast may look red or inflamed and any change in skin texture such as puckering or dimpling of the skin of the breast.

Answer: A, B, D, E

According to American Cancer Society [ACS] (2015) the warning signs of cancer include changes to the skin of the breast. These can include any change in color such as the breast may look red or inflamed and any change in skin texture such as puckering or dimpling of the skin of the breast. Lump(s) in the breast such as either in the breast, upper chest or armpits. Change in the appearance of the nipple such as one might become inverted (turned in) when it normally points out. Changes to the skin of the breast which can include any change in color such as the breast may look red or inflamed and any change in skin texture such as puckering or dimpling of the skin of the breast. The other patient with a 10 pounds weight gain do not have warning signs of cancer.

8. How often, if at all, should women check their breasts for possible signs and symptoms of breast cancer?

a. At least once a month

b. Everyday

c. Once a year

d. Once every six months

Answer: A

The American Congress of Obstetricians and Gynecologists [ACOG] (2012), continues to counsel women that breast self-exam has the potential to detect palpable breast cancer and can be performed. They do not state how often, although traditionally it was recommended approximately once a month at the same time in your cycle, such 7 days after the period.

9. A patient comes to the clinic with chief complain of breast pain on and off for about 2 years. Patient is concerned about breast cancer. What should you ask?

a. Do you wear under wire bra?
b. Is the pain worst during the period?
c. Do you feel any lump on your breast?
d. Do you drink a lot of coffee?

Answer*:* A, B, D

According to American Cancer Society [ACS] (2015), fibrocystic changes are diagnosed based on symptoms, such as breast lumps, swelling, and/or tenderness or pain. These symptoms tend to be worse just before your menstrual period begins and may change as you move through different stages of the menstrual cycle. Many women with fibrocystic changes have mild discomfort from fibrosis, and may get relief from well-fitted, supportive bras, applying heat, or using over-the-counter pain relievers. Some women report that their breast symptoms improve if they avoid caffeine and other stimulants found in coffee, tea, chocolate, and many soft drinks.

10. A patient should have her first mammogram at age:

a. 30
b. 40
c. 50
d. Mammogram is not an import screening test

Answer: A

The mammogram has been shown to be one of the best methods to reduce late detection of breast cancer (CDC, 2015). The ACS (2014) recommends monthly self-breast examination (SBE) with every three-year clinical breast examination (CBE) and a yearly mammogram starting at the age of 40. Moreover, according to the Agency for Healthcare Quality and Research [AHRQ] (2014), the accepted best practice among the outpatient clinics is to screen for breast cancer every year starting at the age of 40.

Appendix G: Expert Rating and CVI Calculation

Content Validity Index Table

Item	Expert 1	Expert 2	Expert 3	Mean
1	4	4	4	4
2	4	4	4	4
3	4	4	4	4
4	4	4	4	4
5	4	4	4	4
6	4	4	4	4
7	4	4	4	4
8	4	4	4	4
9	4	4	4	4
10	4	4	4	4

According to Polit and Beck (2006), the procedure consists of having experts rate items on a four-point scale of relevance. Then, for each item, the item (CVI) (I-CVI) is computed as the number of experts giving a rating of 3 or 4, divided by the number of experts-the proportion in agreement about relevance. The content validity index is calculated using the following formula:

CVR = [(E-(N/2)) / (N/2)] with E representing the number of judges who rated the item as Moderately Relevant or Highly Relevant and N being the total number of judges. The mean total of all of the means will indicate that all of the questions were moderately/highly relevant.

The calculation is as follows:

CVR = [(3-(3/2)) / (3/2)]

CVR = [(3-1.5) /1.5]

CVR = 1.5/1.5

Therefore, to show reliability and validity three experts will rate the questionnaire and if relevant the questionnaire will obtain score of 3 to 4.

Moreover, the objectives of this Doctor of Nursing Practice (DNP) project are to:

1. To develop a culturally sensitive breast cancer screening protocol to improve early identification and management of women at risk for breast cancer that will be validate through project team, PM and content expert review prior to implementation.
2. To educate the providers of an outpatient clinic to the protocol through an education tool as PPT which will be validate through project team, PM and content expert review prior to implementation.
3. Measure adherence to protocol through chart audits tool to evaluate if risk assessment and evaluation was done on patients regarding breast cancer screening.
4. To improve providers knowledge, skills, and attitudes towards breast cancer screening through survey tool development that will be validate through project team, PM and content expert review prior to implementation. I will show reliability through basic statistics and Wilcoxon Signed Rank to evaluate the results of the survey tool.

The project design will include an implementation of a protocol to increase adoption of breast cancer screening by the primary care providers. Data collection will include administration of a survey and utilization of chart audits. A survey tool will be used during both the pre- and post-testing as the data collection tool. Basic descriptive statistics and Wilcoxon

Signed Rank will be used to evaluate the results of the survey tool to show reliability. The Wilcoxon Signed Rank is designed for use with repeated measures; that is, when the participants are measured on two occasions, or under two different conditions (Pallant, J. (2013). The Wilcoxon Signed Rank will be suitable to evaluate the outcomes of the intervention as this nonparametric alternative to the repeated measures t-test compares them at Time 1 and Time 2 (Pallant, J. (2013).

Reference

Pallant, J. (2013). SPSS survival manual: A step by step guide to data analysis using IBM SPSS. (5th ed.). New York: McGraw Hill.

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