# Impacting Breast Cancer Screening in Rural Arizona: A Patient-Centered Approach

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**Abstract**

Breast cancer is a highly complex disease process and is the second leading cause of death in American Indian/Alaskan Native women. Mammography is the gold standard for breast cancer screening, however current mammogram rates of an organization that primarily serves American Indian and Alaskan Native (AI/AN) women are below the national average. AI/AN women suffer from high mortality rate related to breast cancer and they also experience low breast screening rates. This improvement project's aim was to determine if same-day mammogram access would narrow this gap. The project design used a patient-centered approach, engaging the patient at their regular primary care provider appointment. If women were due or overdue for a mammogram and were asked if they would like to have a mammogram completed the same day as their appointment. While only one person opted for the same day mammogram, 31 women agreed to make a future mammogram appointment and 18 women completed their mammogram, which was clinically significant. Recommendations made by a women's primary care provider essentially influenced their screening behavior. Further discussion should focus on the importance of fostering a strong primary care provider-patient relationship to address the gap that currently exists with AI/AN women and breast cancer screening.

*Keywords: Mammography, Women, American Indian/Alaskan Native, Strategies and Breast Cancer Screening*

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Breast cancer is an extraordinarily complex disease process and affects every country in the world. Mammography is the gold standard for screening for breast cancer and diagnosing breast cancer in its initial states is ideal for treatment and recovery. In the United States (U.S.), cancer is the second leading cause of death, following heart disease according to the Center for Disease Control (2022). Breast cancer is the second leading cause of cancer death in women, second only to lung cancer. American Indian/Alaska Natives (AI/AN) have a lower health status for varied reasons, such as disproportionate poverty, health delivery unfairness, and cultural differences (Indian Health Services, 2019). Heart disease, malignant neoplasm, unintentional injuries, and diabetes are leading causes of AI/AN deaths; however, AI/AN women have lower than the average breast cancer screening rate, and the second highest mortality rate (ACS, 2022). Without closing this gap, more AI/AN women may be affected by this disease process.

There are 3.7 million individuals who identify as AI/AN or 1.1% of the U.S. population. (U.S. Census Bureau, 2020). Among the 573 AI/AN federally recognized tribes, there are 22 tribes located in Arizona (Bureau of Indian Affairs, 2018). Native Americans are a matriarchal society, meaning women are highly respected and the family lineage begins with the mother. The tribes nestled in southeastern Arizona are part of this culture. Native Americans make up such a small percentage of the population, subsequently any disease process can negatively affect this population. These women are grandmothers, mothers, aunts, and daughters therefore lineage must be preserved. Early detection is key in decreasing deaths related to breast cancer. Breast cancer screening is a serious public health issue among AI/AN women, therefore mammograms are essential to preserving the women of the family.

Breast cancer is an extraordinarily complex disease process that affects many aspects of a person's life, including mental and physical health. The importance of breast cancer screening is evident in the AI/AN population. The purpose of this quality improvement project is to explore interventions that impact breast cancer screening rates of middle-aged AI/AN women and apply the evidence to an existing process. Research illustrates there are a variety of interventions that positively influence breast cancer screening rates, such as community education, provider/nurse education, and patient navigation, whose activities may include reminder phone calls and even accompanying patients to mammogram appointments. This Doctor of Nursing Practice (DNP) project aims to evaluate the effects of enhanced access to a preventative service, mammograms, by offering same-day or walk-in options. Mammography is the gold standard for breast cancer screening (Esserman & Joe, 2021). Identification of proposed interventions will help close the gap that currently exists in screening for breast cancer in this population, by providing treatment opportunities early to improve quality of life in those women who may be diagnosed with breast cancer.

This quality improvement project investigated the integration of same day mammography access and how it affects breast cancer screening adherence rates. More specifically, among middle-age AI/AN women (P) facing breast cancer screening barriers, does same day mammogram screening access (I) compared to no same-day (C) access affect breast cancer screening rates (O). The goal is to increase breast cancer screening in AI/AN women. The primary care team, in collaboration with the radiology team, facilitated same day mammograms.

## Synthesis of Evidence

Critical appraisal is a fundamental skill of the DNP scholar in today's healthcare climate. (Melnyk & Fineout-Overholt, 2109). Databases searched included Cumulative Index to Nursing

and Allied Health Literature (CINHAL), PubMed and PsycInfo. These databases were selected based on their contribution in providing good sources to search for primary studies. Keywords included: *Breast cancer screening, women, American Indian/Alaskan Native, mammography, and strategies.*

CINAHL yielded 6,513, PsycInfo 3,767 and PubMed 98. The years 2018 to present were added and yielded, 2,046 (CINAHL), 3,767(PsycInfo), and 47 (PubMed). The term Native American/Alaska Native was excluded due to the scarce numbers of credible studies specific to this population term. Instead, American Indian/Alaska Native (AI/AN) women was used. Additionally, full-text yielded 962 studies of which 19 were randomized-control trials. One of these studies was utilized in this review. PubMed yielded 447 articles using the same criteria and key words. After dates were added, it was difficult to narrow the results, so publications were added that pertain to the AI/AN population. This decreased the yield to twenty-four articles. PubMed initially yielded 98 articles; however, when years (2018 – present) were added, 47 studies were yielded. Then randomized controlled trials (RCT) and systematic reviews were added, the resulting yield was nine. The studies were reviewed, and ten studies were chosen for rapid critical appraisals reflecting strategies that affect breast screening rates. The Nelson (2010) study was retained due to its similar practice to the local healthcare system, where this DNP project was implemented.

The Hierarchy of Evidence was utilized to assess the level of evidence in the review of the articles (Melnyk & Fineout-Overholt, 2019) (Appendix A). Most of the studies were level two evidence randomized controlled trials (RCT), providing significant support of various activities and its effect on improving breast cancer screening rates, including same day access, telephone call, reminder letters and patient navigation (see Appendix A, Table A1). The studies

used theoretical models such as the Transtheoretical Model, Health Belief Model (HBM), Theory of Planned Behaviors, and Social Cognitive Theory. The supporting evidence included two systematic reviews, six randomized control trials, and two longitudinal studies. (Appendix A, Table A2).

The use of concrete data, such as insurance claims as an indicator of completed mammograms, ensured the accuracy of data. Of the ten articles, most of the studies had sizeable participation, ranging from 49 to 22,113 individuals, and the systematic reviews comprised of a range from 10 to 37 articles. The articles were comparable to the group in which the patient navigation activities were used, rural and underserved women. All studies were quantitative studies with minimal bias observed. The findings from these studies reveal several successful interventions that highly influence adherence rates to breast cancer screening, such as reminder phone calls, mailed letters and same day access.

## Theoretical Framework

Utilizing the HBM as the theoretical framework may help understand what patients believe about their health and identify barriers and gaps in breast cancer screening adherence (Appendix B, Figure B1.) The HBM was chosen as the conceptual framework for this quality improvement project due to its association with health action and breast cancer screening. The HBM was developed in the 1950s by the U.S. Public Health Service to understand the disconnect with adopting disease prevention strategies for early detection of disease (Janz & Becker, 1984). HBM has six main concepts: perceived susceptibility, perceived seriousness, perceived benefits, perceived barriers, cues to action and self-efficacy.

Perceived susceptibility or severity must outweigh the barriers for the person to engage in breast screening. If a woman believes they are not at risk, they are less likely to get a

mammogram. Perceived benefits are related to the women's perception of a particular action(s) would reduce the severity or susceptibility of a disease process or have a positive outcome; the woman believes breast cancer screening is beneficial to their health.

Perceived barriers are related to the women's belief that a particular action would negatively impact them, such as complexity, duration, and accessibility. Cues to action are people, events and external things that motivate one to adopt a new behavior. Self-efficacy is assessing their ability to successfully act or complete a behavior, despite their perceived barriers, in this case complete breast cancer screening (Butts & Rich, 2018).

## Implementation Framework

The implementation framework that guided this initiative is the Model for Improvement (MI) (Appendix B, Figure B2.) The MI is designed to improve processes within a complex system and help teams achieve substantial advances (Thull-Freedman, 2022). This model has been adopted for its ability to assess small changes that can be tested on a small scale relatively quickly (Connelly, 2021). MI is comprised of three major questions: What are we trying to accomplish? How will we know that a change is an improvement and What change can we make that will result in improvement? (IHI, 2019). Once these questions are answered by the organization, the plan, do, study and act (PDSA) cycle can begin.

### What are we trying to accomplish?

The aim should be time-specific and measurable and define a specific population of patients that will be affected (IHI, 2019). The goal is to improve the quality of care for women who are due for a mammogram, by promoting same-day mammogram screening appointments for women between the ages 40-74 years of age per American Cancer Association (2022) recommendations within six weeks.

**How will we know that a change is an improvement?**

The teams will use quantitative measures to determine if the change leads to an improvement (IHI, 2019). In this project, the goal is to increase access to mammograms, by offering same day access. The outcome that will determine whether a process change was an improvement, is the increase in breast cancer screening adherence according to the Government Performance Results Act (GPRA) from its current rate of 32%.

**What changes can we make that will result in improvement?**

The ideas for change may come from those who work in the healthcare system or from others who have successfully improved the same similar process (IHI, 2019). Evaluating what is working well and making slight changes to improve the chances of success is a part of the MI model. The aim of the project is to increase access to mammography to impact breast cancer screening rates; therefore, offering a same day access will be successful if women obtain a mammogram as referred by their primary care provider.

## Plan-Do-Study-Act (PDSA)

The next step in MI is the PDSA cycle. PDSA cycles are small tests of change to optimize a process. The *Plan* stage includes evaluating the current process, identifying gaps, and exploring alternative processes and opportunities for improvement. In this stage, two pilot teams were assembled and the stakeholders were identified, including radiology staff, primary care providers, a nurse and medical assistant. This team defined the ages 40 –74 as the screening criteria based on the American Cancer Socirty (2022). In the *Do* phase, the radiology team informs the primary care teams of the availability of same-day mammogram availability and communicates if there is a cancelation. This phase also includes the pre-planning for the visit and

chart review of patients who are due or overdue for a mammogram. In the *Study* phase data is reviewed such as consults entered in the electronic health record (EHR) and completed mammograms on the same day. This phase also includes data tracking and identifying barriers and providing feedback to the primary care team. The *Act* phase will be composed of assessing progress, outcomes and providing recommendations for process improvement. This phase would also include sharing findings of project.

## Methods

The purpose of this project was to develop and implement an evidence-based quality improvement process to impact breast screening rates by offering same day access to mammography for AI/AN women.

### Ethical Considerations

Ethical knowledge is based on the promise to respect human life (Moran, et al., 2017). Four ethical principles guided this project, including respect for autonomy, beneficence, non-maleficence, and justice. Respect for autonomy is the capacity to determine one's own action through independent choice (ANA, 2018). This principle was maintained by allowing participants to provide verbal consent to participate in the same day option or decline. Beneficence is the promotion of good, ensuring the participant's best interest was a priority, regardless of the nurse's opinion (ANA, 2018). This principle was maintained by providing nurse care coordinators with the most up-to-date information to share with participants. Maleficence is to do no harm (ANA), 2018). This principle was maintained by encouraging the participant and care team to ask questions to garner information by inquiry to provide the best care possible. Justice is the fairness or an equal distribution of benefits, despite a participant's

age, ethnicity, economic status, religions, or sexual orientation (ANA), 2018). This principle was upheld by educating the staff to enhance and promote an ethical practice environment.

This quality improvement project posed minimal risks to participants who chose to participate in the same day mammogram, which was recommended by the primary care provider. There was no direct participant contact by the project leader. The outcomes were secondary to the intervention initiated by the provider, therefore informed consent was not necessary. Consent was implied when the participant agreed to receive a mammogram the same day.

**Setting and Stakeholders**

The project was performed at a critical access hospital in southern Arizona. The setting was in a primary care clinic, primarily serving AI/AN population. The stakeholders include clinical leadership (nursing and medical), departmental leadership (radiology), the primary care teams and the women who are due or overdue for a mammogram. In addition, the radiology appointment clerks were essential to access this service as well as the mammographer and radiologist. Marketing was also leveraged for marketing opportunities to promote same day (walk-in) accessibility, as illustrated in the Logic Model (Appendix C, Figure C1).

The primary care team encompassed a medical provider, nurse practitioner, nurse care coordinator and a medical assistant, as well as scheduling staff. The selected site has mammography capabilities within their setting and language interpreters if needed. The two pilot teams alongside the radiology team mutually agreed to offer same day scheduling for mammograms to women who are due for a mammogram screening.

**Participants/Recruitment**

The targeted population aligns with the ACS (2022) recommendations of women between 40-74 years of age that are due for breast cancer screening. The target population

information was retrieved from the EHR by the site champion for the two primary care providers in this project. The recruitment was based on the need for breast cancer screening and same-day access for screening. The exclusion criteria include men and women with current diagnosis of breast cancer, women who are current with their mammography and women who are not between the ages of 40 and 74 years. There was no consent or incentive to participate in this QI project. Breast cancer screening for this age group is routine and aligns with normal preventative measures and does not include more than minimal risk and involves no procedure in which written consent is normally required.

**Project Description/Timeline**

This project sought and obtained a Tribal Institutional Review Board (IRB) review and was deemed exempt from review (Appendix D). Additionally, the Arizona State University Internal Review Board also deemed the project exempt from full review (Appendix D). The project began in August 2023 for a total of six weeks. Once approval was obtained, a stakeholder meeting was held to outline the details of the improvement project. An implementation team consisted of two primary care providers, a clinical registered nurse care coordinator, medical assistant, mammographer and radiology appointment desk staff, along with the senior executives who oversee the disciplines. The implementation team met every two weeks for information sharing and discussed successes and challenges. Data was collected by the site champion on a chart audit form and compiled in a Microsoft Excel spreadsheet and compiled and shared with the project leader, the implementation and leadership teams (Appendix E, Figure E1). Given the initially low interest in same day access, the team created signage to post in the exam rooms to generate more interest. The pilot team also requested information about how to address

expressed barriers by patients such as limited time, the painful nature of the procedure, or the intent to visit their women's health provider.

The project description included a team approach to impact breast cancer screening rates by offering same day access to a mammogram. The primary care teams and leadership were briefed on this project and capabilities to offer same day/walk-in mammograms were discussed with the stakeholders. Two primary care teams volunteered to participate in the QI project, after the information meeting held about the quality improvement project. The site champion, who was also the primary care nurse manager was instrumental to the success of the project by providing data timely and setting up the meetings.

The project was introduced in an informational meeting with the primary care teams and staff, including the Medical Director, nursing leadership, and scheduling staff. The meeting was received well, engagement was captured by their many questions and ideas on how to improve mammogram rates. There was an opportunity for questions and answers such as how we communicate mammogram availability, who is going to talk to the participant about the mammogram, and what number does the participant use if they choose to make an appointment later.

The medical assistant conducted chart reviews daily to identify women who were due or overdue for a mammogram. Those who were candidates for a mammogram were discussed with the provider who then offered the same day mammogram and screening education during the usual clinic visit. The radiology appointment clerk determined daily how many same day/walk-in access appointments were available and communicated with the teams via EHR notification. The provider documented whether the participant agreed to a same-day mammogram appointment or if the participant declined; the reason for declination was captured in most cases. If the

participant declined the same-day mammogram, a future appointment was secured by calling the radiology appointment clerk and the provider would order the mammogram. An informational card was provided to the potential participants which outlined benefits to getting a mammogram if they were due for a mammogram (Appendix F, Figure F1). This card was created in collaboration with the marketing team and served as a communication tool between departments to identify women who would like to have a same day appointment later. There were a few assumptions drawn prior to the start of this project including, the demand would supersede supply, those participants with a female provider will outnumber those who have a male provider.

**Data Collection**

Data was collected on a chart audit form and compiled in an Excel spreadsheet which included the number of ordered mammograms and how many women had a same-day mammogram, the number of refusals, the number of future appointments made. The information was shared with the implementation teams, including the providers. This information sharing allowed for a logical inference from project results, which helped identify obstacles to the project's success and opportunities for sustainability.

**Outcomes Measures**

The results reflect the PICO question: Among middle-age AI/AN women facing breast cancer screening barriers, does same day mammogram screening access, compared to no same-day access affect breast cancer screening rates. The outcomes of this project will be displayed by the number of participants who choose to receive a mammogram the same day as their primary care appointment and those who choose not to participate in same day mammogram access.

### Tools and Instruments

The tools used for this project were the electronic health records accessed by the primary care teams, a Microsoft Excel spreadsheet and an information card created by the marketing team. The data collected are the number of referrals and the number of mammograms performed on the same day as the participant's primary care provider appointment. The data was compiled in an excel spreadsheet and provided to the project leader. A chart audit form was used for this quality improvement process. The chart audit form was employed due to its simplicity and rapid deployment, which can lead to meaningful change (IHI, 2019)

### Data Analysis Plan

Quantitative data analysis for this project consisted of calculating the percentage of completed mammograms against mammogram orders compared to those who completed same day mammograms. This quality improvement project was predicted to improve adherence to mammogram screening.

## Results

### Analysis of Outcome Measure

The aim of this QI project was to improve adherence to screening mammograms by offering same day access to women between the ages of 40 and 74 who were due for a mammogram screening. Descriptive statistics were used to summarize key characteristics of collected data and frequencies and percentages were calculated for each nominal variable. The final number of participants was sixty-six, which exceeded the goal of fifty participants and all the participants were female. The data revealed one person completed a same day mammogram appointment (Appendix G, Table G1). The observations for Age had an average of 59.02 ($SD$ = 8.88, $SE_M$ = 1.09, Min = 41.00, Max = 74.00).

There were barriers by the participants that may have impacted same-day access opportunities, such as not feeling well or experiencing acute issues like broken bones. Also, time was a factor affecting the decision to complete a same-day mammogram.

While one person opted for the same day mammogram access, 31 women chose to make a mammogram appointment for a later date. Of the 31 appointments, 18 women kept their mammogram appointment. The single same day mammogram project did not yield statistically significant findings, however the number of women who kept their mammogram appointment after making an appointment was clinically significant.

**Impact**

The impact of not receiving a mammogram when it is due can have monumental implications on the health of a women who may be at risk for breast cancer. The number of those who kept their mammogram appointment can reduce deaths related to breast cancer (USPTF, 2016). Breast cancer is the leading cause of cancer death in AI/AN women, therefore mammography can help save the matriarchal lineage. This QI project demonstrates a women's screening behavior can change if the discussion about breast cancer screening begins with the provider. If breast cancer can be detected early, it can be treated and cured early.

**Sustainability**

The site champion will continue to work with the project leader as a consultant, alongside the primary care teams and radiology department to continue to enhance access of same day mammography. The PDSA will continue to be built on and communicated monthly to make small tests of change to enhance the current referral process to foster timely adherence to breast cancer screening.

The primary care teams will offer same-day mammogram appointments to participants as part of their patient-centered medical home. The providers and care team will be given information to share with participants to answer common questions about mammography. The marketing team will continue to be an integral part of sustaining this project with their artistic ways of attracting women who need a mammogram screening, as well as ensuring information circulates within the community via radio, newspaper, and social media. Additionally, the project leader will serve as a consultant to enhance sustainability.

## Discussion

### Summary of Findings

The findings did not reflect the success of same day access; however, the findings do suggest that communication between providers and patients can influence a patient's decision to get a mammogram as demonstrated with 18 of the 31 women keeping their future mammogram appointment. The project addressed ways to increase adherence and reduce no-show or cancellations by improving interdepartmental communication. This project highlighted other operational opportunities as well, including. streamlining the scheduling process and improving communication collectively.

Shared decision making can influence mammogram screening; thus, it is important providers talk with their patients about preventative measures such as breast cancer screening. Patient engagement and understanding the existing barriers to preventative screening has immense potential to close the gap in cancer screening. Understanding the risks of undiagnosed breast cancer may create awareness and adherence to cancer screening. The AI/AN community has an inherent distrust of western medicine. If the provider spends extra time to discuss benefits of a mammogram, the time spent with the patients can convey 'caring', which can promote trust.

There were some notable differences in how the two providers determined a need for mammogram. One provider preferred to do an extensive chart review to determine whether the mammogram was suitable based on their acute issues or co-morbidities, while the other provider entrusted the care team to help with facilitating the consulting process. Before spreading this process further, one consistent method would need to be determined. The goal would be to promote top-of-license practice, thus relying on other team members who could appropriately determine the need for mammography.

Although same-day access may not be the answer, provider and care team engagement seem like a reasonable next step. A patient navigator may supplement the effort and promote engagement with the patients by exploring existing barriers and serve as an advocate for the patient. Additionally, if there are same day appointments available, they should continue to offer the same day as an option.

**Key Facilitators**

The implementation team's enthusiasm and engagement to provide same day mammogram was an immense contributor to the project. The team members were comfortable and familiar with the project leader who was knowledgeable about the organization. Additionally, the project leader is of similar heritage which may have contributed to the team's understanding of the importance of mammograms. The commitment to schedule an appointment was evident in the team approach and provider involvement. Initially, the team pondered how they would add this intervention in the participant's appointment time; however, the importance of the screening outweighed the possibility of an extended patient visit. This is the beginning of a new process with potentially positive outcomes. Lastly, the site leader also voiced desire to

impact mammogram rates and facilitated this project with both nursing, medical and radiology team members.

**Kay Barriers**

The mammographer availability and provider team schedules did not align, so the need for more communication was critical. Diagnostic mammograms were scheduled for the mornings and screening was completed in the afternoon. This posed a challenge communicating a cancellation for potential walk-ins, due to last minute diagnostic mammogram, however patients did not want to wait until the afternoon.

The providers spent time reviewing the record for relevancy, as some participants had acute and multiple co-morbidities and a recommendation for a mammogram was not discussed with the participant. Team members also found it difficult to address common barriers the participants expressed such as fear, time constraints, pain, and limited awareness of breast cancer risks. The length of the project was six weeks, which may have been too short to create a supportive structure.

**Related Findings**

The confidence level of primary care provider's recommendation for mammogram screening as well as provider's comfort level with discussing mammogram screenings may affect adherence rates. Additionally, there is limited data on the challenges the women of this rural area perceive as barriers to getting a mammogram, however research does relate competing priorities and cultural or trust may factor in adherence rates. This needs to be explored more in this population.

## Recommendations

Same day access to mammogram can be enhanced with increased communication and signage in the rooms**.** The recommendation to leverage social media to promote breast cancer screening may improve utilization, perhaps exploring other engagement strategies, such as letters, reminder phone call, patient navigation or create a unique campaign for AI/AN women such as storytelling. AI/AN are modest people and storytelling may help with dealing with the anxiety of receiving results of the screening. AI/AN are storytellers by nature, so if the women could find women with comparable stories, they may be more inclined to getting a mammogram. There is also an opportunity to review the appointment process to optimize the four days mammography is available. Another recommendation is to assess provider's confidence about discussing mammograms with the participants.

## Conclusion

A collaborative patient-centered approach was utilized to improve breast cancer screening rates for AI/AN women in rural Arizona. The approach included promoting same day access to mammograms while they had an appointment with their primary care provider and offering a follow-up appointment if same day scheduling did not meet the woman's needs. This project did highlight some opportunities for improving patient-provider relationships, improved scheduled process and communicating the relevance of breast cancer screening among AI/AN women. There was also opportunity to provide education to the staff about mammogram so they can address any potential challenges the women may experience, emphasizing the importance of mammograms.

The goal to reduce barriers to improving health outcomes of the women in this rural community must explored. The data shows women were committed to complete a mammogram

later that would better suit their schedule. Notably, 18 of the 31 women kept their mammogram appointment which demonstrates the influence providers can have on their patients. Opportunities to engage with our patients, our matriarchs, needs to be better understood.

This intervention is aimed to close the existing gap with breast cancer screening among AI/AN women and encourage AI/AN women, mothers, sisters, and daughters to get screened. This accentuated access to care will reflect in early breast cancer detection and ultimately affect mortality of AI/AN women. The intervention led to a positive outcome of enhancing provider education about mammograms and the women choosing to make a mammogram appointment at a later time. The outcome aligned with the organization's mission and vision to heal, serve, and empower the People. The project also outlined the importance of a patient-centered approach and interdisciplinary communication to promote health in a collaborative approach. Lastly, utilizing multiple modalities to engage patients would benefit the matriarch society, by keeping up with regular mammogram, improving detection and ultimately saving lives.

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# Appendix A

## Table A1

*Evaluation Table for Quantitative Studies*

| Citation | Theoretical/ Conceptual Framework | Design/ Method/ Purpose | Sample/Setting | Variables | Measurement/ Instrumentation | Data Analysis | Results/ Findings | Level of Evidence; Application to practice. Generalization |
|---|---|---|---|---|---|---|---|---|
| Braun, et al. (2015). Reducing cancer screening disparities in Medicare beneficiaries through cancer patient navigation.<br><br>**Country**: United States of American<br><br>**Funding**: CMS<br><br>**Bias**: The Navigation staff collected baseline and exit data | Social Cognitive Theory | **Design:** RTC, Pre/Post design<br><br>**Method:** Navigators were provided with a list of Medicare beneficiaries. Navigators found contact information for the individuals on the list and called them or made home visit to recruit. A random number generator assigned participants to intervention v control group.<br><br>**Purpose:** Test the effect of | **N=** 488 (242 Experimental group/246 Control group)<br><br>**Demographics:**<br>**Gender:** 47% male, 53% female,<br>**Mean age** 68.4,<br>**Ethnicity:** 43% Native Hawaiian, 35% Filipino, 12.4% Japanese, 8% other ethnicity.<br>**Language:** English (82%)<br>**Education:**<br><HS: 38.8%<br>HS: 32.6%<br>>HS/College: 27.7% | **IV1:** Providing Patient Navigation services (mail, reminder phone calls, schedule appointment) to Medicare beneficiaries.<br><br>**DV1:** Cancer screening rates (Pap, mammogram, PSA).<br><br>**Definition:** Navigation is a process that nurses, social workers, and | **Tools**: Cancer Status Assessment<br><br>Medicaid claims | **Statistical Test Used:**<br><br>Self-report at baseline & differences<br><br>Chi-Square analysis | **DV1:** Study suggests navigation services are effective in increasing breast, cervical, prostate, and colorectal cancer screening in Asian and Pacific Islander Medicare beneficiaries.<br><br>Pap: 57% (IG) v. 36.4% (CG) (p=0.001)<br><br>Mammogram: 61.7% (IG) v. 42.4% (CG) (p=0.003)<br><br>PSA: 54.4% v. 36% (p=0.008) | **Level of Evidence:** High, Level 2<br><br>**Strengths:** RCT design, adequately powered sample.<br><br>Although the self-report data could not be compared to Medicare data, 377/488 were and showed comparable results.<br><br>**Weakness:** Navigation staff collected baseline and exit data.<br><br>Blind to baseline data, but not to the exit data. |

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| | | navigation on cancer screening and treatment in older, Medicare-eligible adults | **Setting:** Medically underserved and primary healthcare shortage area<br><br>**Exclusion:** non-Medicare Adults<br><br>**Attrition:** 0 | lay workers can provide, and the exact navigation services provided care according to the professional training and certification of the navigators**.** | | | Colonoscopy: 43% v. 27.2% (p= <0.001) | Analysis was based on self-report screening behaviors by study participants. (Unable to report against Medicare data).<br><br>**Feasibility:** Training for the PN ranges from 12-400 hours.<br><br>**Application:** The study was conducted in a small, isolated community, limiting generalization. |
| Champion et al., (2020), An RCT to Increase Breast and Colorectal Screening<br><br>**Country**: United States of America | Theory of Planned Behavior, Health Belief and Transtheoretical Model | **Design:** 2X2 RTC<br><br>**Method:** those who met eligibility were randomized to 1 of 4 groups. (692/4,834). | **N=** 692<br><br>**Demographics:** **Gender:** Female 100% **Mean Age**: 58.7 years old. **Education**: | **IV:** Tailored interventions using web-based intervention, phone delivery by a trained | **Tools:** Health Belief Model, Self-Report and Chart Audit<br><br>**Validity/ Reliability:** | **Statistical Tests Used:** Statistical analysis, general linear model. | All interventions increased the completion of mammo and or stool test compared to the usual practice. **DV1:** Web <0.0249 | **Level of Evidence:** High; Level 2<br><br>**Strength:** **I**nterventions were significant in compliance with screening for BC |

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| **Funding**: None, however publishing was supported by NIH<br><br>**Bias**: None identified/disclosed | | Women who were non-adherent to both BC and CRC cancer screening, ages 51-75.<br><br>**Purpose:** Suboptimal screening tests for BC and CRC, the purpose was to compare tailored interventions to usual care | HS or less: 28.8%<br>Some College: 43%<br>4-year College: 28.2%<br>**Ethnicity**: African American: 11.3%<br>Caucasian: 84.8%<br>Asian/Pacific Islander: 3.9%<br><br>**Setting:** Outpatient clinic<br><br>**Exclusion:** history of CRC, colorectal polyps, or IBS or medical conditions prohibiting crc screening. Those who were ineligible opted out, refusal, passive refusals | navigator or by both.<br><br>**DV1:** Adherence rates to BC and CRC screening<br><br>**Definitions:** Web-based program: tailored messages based on the individual's knowledge, perceived and actual risks for both BC and CRC. | Self-report was validated by chart reviews**.**<br><br>HBM valid and reliable (Mohamed et al., 2019). | F-test, Wald chi-test for categorical variable (95%CI) and binary logistical regression for analysis of interaction effect.<br><br>Sample size >100 in each group to ensure 80% power to detect 20% differences in 6-month screening between any pair of randomized groups. | CRC: 29.1% v 23%<br>Mammo: 39% (IG) v. 32% (CG)<br>**DV2:** Phone 0.0003<br>CRC: 63% (IG) v. 23% (CG)<br>Mammo: 41% (IG) v 32% (CG)<br>**DV3:** Both <0.0001<br>CRC: 47% (IG) v. 23% (CG)<br>Mammo: 34% (IG) v. 32% (CG)<br><br>It was noted there was a 4.5 times chance of completing colonoscopy if they completed the mammo. | and CRC**.** Those who completed an intervention received $20 for participation.<br><br>**Weakness: L**imited, due to the women in the study were insured, Caucasian and had access to web-based program<br><br>**Feasibility:** Explore increase access to internet will increase access recommendations<br><br>**Application:** Technology access and smart phones may make interaction easier. |

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| | | | (consented, but did not participate).<br><br>**Attrition:** 184 due to loss to f/u | | | | | |
| Marguiles, et al., (2019), Monitoring and developing a volunteer navigation intervention to improve mammography compliance in a Safety Net hospital.<br><br>**Country:** United States of America<br><br>**Funding:** None identified<br><br>**Bias:** None | Health Belief Model | **Design:** RTC (24 control/25 in Intervention group)<br><br>**Method**: Patient Navigator randomly assigned x 3 weeks and followed 3 months post-intervention for compliance.<br><br>**Purpose:** Volunteer-run navigation intervention aimed to effectively improve mammography compliance and is affordable for | **N=** 49<br><br>**Demographics:**<br>**Gender:** Female 100%<br>**Mean Age**<br>54.4 years old<br>**Ethnicity**<br>Hispanic: 44.8%<br>Caucasian:2%<br>African American: 12.2%<br>Asian: 4%<br>Other: 32.6%<br>Education<br><High school: 38.7%<br>High School: 48.9%<br>Unknown: 16.3%<br><br>**Setting:** Medicine, | **IV1:** Patient Navigator provided for patients who needed mammogram (education, MI and escorting to mammogram suite)<br><br>**DV1**: Mammogram compliance rate<br><br>**Definitions:** Patient Navigation – providing individualized support | **Tools:** Completion records within EHR<br><br>**Validity/ Reliability:** EHR from the hospital it was ordered from. | **Statistical Tests Used:**<br><br>Fisher's Test | **IV1**: Increase in mammograms for this population.<br><br>**DV1**: No significance in group for completion same day (p>0.05).PN improved mammogram compliance by 34% P value: 0.05 (42% in the CG v. 76% in the IG). Mammograms were completed in the intervention group within 14 days. Number of days between order and screening – non- | **Level of Evidence:** High: Level 2<br><br>**Strengths:** is applicable to practice<br><br>**Weakness:** 49 participants. Only those completed at the facility were counted. Sample size limits the ability to evaluate beliefs and patient characteristics that might affect compliance.<br><br>**Feasibility:** costs were low because the PN were volunteers. Motivational |

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| | | early breast cancer detection. | gynecology, and walk-in medical screening Outpatient<br><br>**Exclusion:** Completed mammo within 6 months of order.<br><br>**Attrition:** none noted. | necessary to overcome barrier they may face in receiving adequate care | | | significant. P value: >0.5 | interviewing requires minimal training and requires little clinic space. Provide same day access to mammo.<br><br>**Application:** A volunteer-run navigation intervention can improve mammo compliance and is affordable. Generalization is weak due to hospital setting. |
| Molina, et al. (2018). Patient Navigation improves subsequent breast cancer screening after a noncancerous result: Evidence from the patient navigation in | Transtheoretical Model | **Design:** RCT pre/post Navigation analysis – Longitudinal/ IV<br><br>**Method** Eligible participants assigned into standard care or | **N= 2,536** (741 Experimental/ 1,795 Control)<br><br>**Demographics:** Gender: Female 100%<br>**Mean Age:** 50-74 | **IV:** PN 1-2 years post initial benign mammo (telephone call, letter and education) | **Tools:** Medical Records<br><br>**Reliability/ Validity:** Data was abstracted from medical records. | **Statistical Test Used:** Multivariable logistical regression & sensitivity analysis. Based on non-1:1 randomization, consider | **IV1:** Navigated women exhibited greater odd of subsequent screening.<br>**DV1:** 49% were successfully contacted. 56% v 46% (control) (95% CI, p=0.003). | **Level of Evidence:** IV<br><br>**Strengths:** Consistent relationship with Navigator is established. Offers implications for further studies. |

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| medically underserved areas study.<br><br>**Country:** United States of America<br><br>**Funding:** Multiple National Institutes of Health grants<br><br>**Bias:** None Noted | | navigation by randomized program in SAS. Compare parent study to gain participants for subsequent screening.<br><br>**Purpose:** Examine whether navigation approaches such as phone/mail be effective in routine screening behavior | **Ethnicity:** African American: 76% Other: 24%<br><br>**Setting:** Primary Care<br><br>**Exclusion:** Those who did not receive an initial mammo from parent study (PNMUA, 2011-14). Those who had abnormal initial screenings.<br><br>**Attrition**: Not described | **DV1:** Breast cancer screening rates | | quasi-experimental in nature | | **Weakness:** PNMUA was not designed to assess efficacy of PN across multiple cancer-related episodes. The study groups were not nearly identical in size (741 v. 1,795). Statistical power was not determined.<br><br>**Feasibility:** Needs further studies. PN may not be cost-effective, however mail and telephone calls are less costly.<br><br>**Application:** Based on weakness, generalization is limited |

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| Nelson et al. (2020). Effectiveness of patient navigation to increase cancer screening in populations adversely affected by health disparities: A meta-analysis.<br><br>**Country**: United States of America<br><br>**Funding:** National Institutes of Health through interagency with Agency for Healthcare Research and Quality<br><br>**Bias**: None noted | Various, not defined | **Design:** Meta-Analysis/I<br><br>**Method:** Eligible studies from various databases, English only using USPSTF recommendations.<br><br>**Purpose:** to evaluate the effectiveness of PN to increase screening for colorectal, breast and cervical cancer in populations adversely affected by health care disparities | **N=** 37 studies (28 crc, 11 breast, 4 cervical, 3 with mixed cx screenings)<br><br>**Inclusion:** Randomized trials and observations studies relevant to populations and effectiveness of PN in cancer screening (crc, breast and cervical)<br><br>**Exclusion:** non-English studies<br><br>**Attrition**: Not applicable | Studies evaluating PN on cancer screening. | Variable per study (letters, call, educational materials, translator, appointment scheduling, transportation, mailed supplies, bowel prep assistance<br><br>**DV**: Breast and cervical & crc cancer screening rates | Meta-Analysis<br><br>Used funnel plot and Egger test to choose studies (p=0.001) | Populations adversely affected by disparities, crc, breast and cervical cancer screening rates were higher in patients with PN services.<br><br>23/28 studies showed increase in CRC cancer screening with PN<br><br>10/11 studies showed an increase in breast cancer screening.<br><br>4/4 studies showed an increase in cervical cancer screening. | **Level of Evidence:** High: Level I - Good<br><br>**Strength:** large number of studies<br><br>**Weakness: u**sing only English language articles, small study effects for crc screening<br><br>**Application:** 37 studies from populations adversely affected by disparities indicated screening rates for crc, breast and cervical cancers were higher for patients who were provided PN services |
| Percac-Lima, et al. (2016). Patient navigation for | Population Health | **Design:** RTC | **N**=1626 (792 PN v. 820 usual care) | **IV:** PN using PB IT system to track | **Tools:** Population based IT system | **Statistical test used:** Linear regression | **IV:** PN as a part of PB IT system significantly | **Level of Evidence:** High: Level 2 |

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| comprehensive cancer screening in high-risk patients using a population-based health information technology system.<br><br>**Country**: United States of America<br><br>**Funding**:<br>None identified.<br><br>**Bias**: None inferred | | **Method:** Patients overdue for cancer screening identified by IT system were randomly assigned to intervention v control group.<br><br>**Purpose:** Evaluate PN for breast, cervical and colorectal screening using PB IT system within primary care | **Demographics:**<br>**Gender**<br>Female: 59.9%<br>Male: 41.3%<br>**Median Age:**<br>57 years old.<br><br>**Setting:** 18 Primary Care settings, 4 community health centers<br><br>**Exclusion:** Those who had PN services, low risk for compliance, without prior bilateral mastectomy, breast MRI within 2 years, no pap smear x 5 years, without colectomy or colonoscopy within 10 years. | overdue screening (letter, call patients, education and training, including goal setting.<br><br>**DV1:** cancer screening rates.<br><br>**Definitions:** High risk for non-compliance – number of overdue screening tests, no-show visit history and language spoken. | **Reliability/ Validity:** | with GEE and Logistic regression with GEE<br><br>**DV1**: Intraclass coefficient of 0.044, an average cluster of 6 and a total of 1612 patients, design effect was 1.2. The study had 80% power with a mean difference of 3.1%. | increased screening rates for breast, cervical and CRC in patients at high-risk for non-adherence<br><br>**DV1:** combined cancers: 10.2% v. 6.8 (CI 95%, 1.5%-5.2%, p<0.001), breast 14.7% v. 11%, CI 95%, 0.2%-7.3%, p=0.04), cervical 11.1% v.5.7% (95%CI, 0.8%-5.2%, p=0.002), & colon 7.6% v. 4.6% (95%CI, 0.8%-5.2%, p=0.01).<br><br>**DV2:** Overall 25.5% (IG) v. 17% (CG) ,(95%CI, 4.7%-12.7%, p<0.001). Single completion: Breast with highest | **Strengths:** Large sample size, PN intervention was beneficial for all regardless of age, sec, insurance, or language spoken. IT can schedule without a clinic visit.<br><br>**Weakness:** Costs. Did not include home fecal blood tests. Study completed in a single academic primary care network.<br><br>**Feasibility:** Cost-effectiveness and patient satisfaction should be assessed; for 8 months $80,000.<br><br>**Application:** management activities for low- |

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| | | | **Attrition:** 14 (due to death, left network, <50 years old only due for breast cancer screening) | | | | completion 23.4% (IG) v. 16.6% (CG). Cervical 14.4% (IG) v. 8.6% (CG), & CRC 13.7% (IG) v. 7.% (CG). | income and racial/ethnic minorities to improve equity of cancer care. Minimal generalization and used an advance IT system. |
| Phillips, et al., (2010). Patient navigation to increase mammography screening among inner city women.<br><br>**Country**: United States of America<br><br>**Funding:** Avon Foundation Safety Net Grant<br><br>**Bias:** None noted | Population Care Model | **Design:** RTC<br><br>**Method:** Quality improvement patient navigation intervention. HEDIS was used to identify individuals who needed BC screening.<br><br>**Purpose:** evaluate the effect of patient navigation intervention on adherence rates to biennial | **N= 3,895** (1,817 Intervention v. 2,078 Control)<br><br>**Demographics: Gender:** Female: 100% **Mean Age**:60 years old **Ethnicity**: African American: 47% Caucasian: 29%Hispanic: 11% **Primary language** English:77%. **Education:** | **IV1:** Navigation intervention as an improvement project (telephone call, reminder letters and embedded PN in the clinic)<br><br>**DV1:** Breast cancer screening adherence rate | **Tools:** HEDIS rates<br><br>**Validity/ Reliability:** Data abstracted from medical records | **Statistical Tests Used**: Descriptive Analysis on patient socio-demographics, Unadjusted logistic regression for each subgroup at post intervention and two-tailed tests with p=0.05 using Statistical Analysis System (SAS). | **DV1:** Increased adherence to BC mammo screening<br><br>**DV2:** improved HEDIS rates and compliance with screening in the primary care setting<br><br>Intervention increased adherence across all ages, insurance groups and education levels of all races in group. | **Level of Evidence:** High, Level 2<br><br>**Strengths:** The study was integrated into the practice with provider "buy-in" and was designed to evaluate the benefit and effectiveness of integrating PN program<br><br>**Weakness:** communication (unable to make contact and no response to letters) |

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| | | mammography screening | Did not attend: 7%<br><HS: 34%<br>HS: 22%<br>Some College: 18%<br>College graduate**:** 15%<br><br>**Setting:** Primary care practice<br><br>**Exclusion:** mammo>18 months, <24 months.<br><br>**Attrition:** none noted. CPT codes were used for completion | | | | | was noted to be significant in those who did not complete screening.<br><br>**Feasibility:** use Medical Home to help support PN services<br><br>**Application:** Embedding a PN in the primary care setting. Use of IT and EHR can limits its generalization |
| Okuhura et al. (2018). Processing fluency effect of a leaflet for breast and cervical cancer screening: a randomized | Health Communication Theory | **Design:** RCT<br><br>**Method:** 670 were recruited, assigned randomly, 215 responded. | **N:** 215 (IG 109, CG 106)<br><br>**Demographic Gender:** 100% Female | **IV1:** Leaflet provided to patients recommending breast and cervical cancer screening. | **Tools Reliability/ Validity**<br><br>Insurance indicating completion of screening | **Statistical Test Used:** Two independent sample t-test, compared using chi- | **IV1: S**creening rates were positively influenced by the intervention. | **Level of Evidence:** RCT level 2<br><br>**Strengths:** a fluently processed leaflet can |

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| Citation | Theoretical/ Conceptual Framework | Design/ Method/ Purpose | Sample/Setting | Variables | Measurement/ Instrumentation | Data Analysis | Results/ Findings | Level of Evidence; Application to practice. Generalization |
|---|---|---|---|---|---|---|---|---|
| controlled study in Japan<br><br>**Country**: Japan<br><br>**Funding:** Japan Society for the Promotion of Science KAKENHI grant.<br><br>**Bias:** No bias noted | | **Purpose:** to test the effect of processing fluency through a randomized controlled study. | **Mean Age:** 49 years old.<br><br>**Setting**: hospital or clinics affiliated with society (insured).<br><br>**Exclusion:** men, those who did not have insurance<br><br>**Attrition:** none noted | **DV1:** Cervical and breast cancer Screening rates | | square test (p= <0.05) | **DV1:** 29.4% (IG) v. 14.2% (CG), p=.007. | encourage patients to get screened.<br><br>**Weakness: S**creening insurance was used to document completion of screening. The people were selected through a magazine article, so this may have recruited a select kind of person.<br><br>**Feasibility:** This requires several modifications of the reading material<br><br>**Applicability:** unable to determine generalizability to other socioeconomic status |

Key: **BC** Breast Cancer, **CG** Control Group**, CMS** Centers for Medicare & Medicaid Services**, CPT** Current Procedural Technology**, CRC** Colorectal Cancer**, DV** Dependent Variable, **DX** Diagnosis, **EHR** Electronic Health Record**, F/U** Follow-up**, GEE** Generalized Estimating Equations**, HBM** Health Belief Model**, HEDIS** Healthcare Effectiveness and Data Information Set, **HHS** Health and Human Services**, HS** High School**, Hx** History**, IBS** Irritable Bowel Syndrome, **IG** Intervention Group**, IV** Independent Variable, **IT** Information Technology, **Mammo** Mammogram**, MI** Motivational Interviewing**, NIH** National Institute of Health**, PB** Population-based**, PN** Patient Navigator**, PNMUA** Patient Navigation in Medically Underserved Areas**, PSA** Prostate Specific Antigen**, RTC** Randomized Control Trial, **V** versus

| Citation | Theoretical/ Conceptual Framework | Design/ Method/ Purpose | Sample/Setting | Variables | Measurement/ Instrumentation | Data Analysis | Results/ Findings | Level of Evidence; Application to practice. Generalization |
|---|---|---|---|---|---|---|---|---|
| Slater et al., (2018). The efficacy of direct mail, patient navigation, and incentive for increasing mammography and colonoscopy in the Medicaid population: A randomized controlled trial.<br><br>**Country:** United States of America<br><br>**Funding:** HHS CDC<br><br>**Bias:** None noted | Planned Behavior & Health Communication theories | **Design:** Randomized, controlled trial (RTC)<br><br>**Method**: Individuals on the Minnesota Medicaid program with overdue (mammo and crc)<br><br>**Purpose:** Whether this multi-intervention approach can effectively promote screening for breast cancer | **N=** 22,113<br><br>**Demographics: Gender: female Mean Age**: 58 years old.<br><br>**Setting:** Outpatient, primary care<br><br>**Exclusion:** not enrolled in Medicaid, not overdue or out of age range.<br><br>**Attrition:** 0% All participants were evaluated by claims for completion of screening | **IV1:** Mailers unique to BC or CRC screening approximately 3 weeks apart in the intervention group(s). incentive $20, persuasive, and innovative mailers and toll-free number for navigation<br><br>**DV1:** Cancer screening rates<br><br>**Definitions:** *None* | **Tools:** CPT Codes, medical records<br><br>**Validity/** Reliability: Data was extracted from medical records | **Statistical Tests Used:**<br><br>t-test and x statistics. Logistical regression. | **IV1**: PN has been shown to improve access to breast cancer and crc screening.<br><br>**DV1**: Intervention group 30% higher screening than controlled.<br>P value: 0.001 | **Level of Evidence:** High; Level 2<br><br>**Strengths:** is applicable to practice. Large group.<br><br>**Weakness:** Did not assess the three interventions separately or independent of one another.<br><br>**Feasibility:** feasible to increase screening in public health insurance programs<br><br>**Application:** Broad impact |
| Vang et al, 2018. Mobile mammography participation among medically underserved | Various | **Design:** Systematic Review<br><br>**Method** English articles in | **N=** 10 studies were reviewed.<br><br>**Demographics:** any racial/ethnic minority group, | **IV:** 4 compared mobile mammography users with 6 mammography | **Tools:** databases (PubMed, MEDLINE, CINAHL, Embase, and PsychInfo) | **Statistical Test Used:** Used published | **IV**<br>**DV1:** Mobile mammo can be used to resolve disparities in mammographic | **Level of Evidence** High: Level I<br><br>**Strengths:** The research shows the use of mobile |

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| Citation | Theoretical/ Conceptual Framework | Design/ Method/ Purpose | Sample/Setting | Variables | Measurement/ Instrumentation | Data Analysis | Results/ Findings | Level of Evidence; Application to practice. Generalization |
|---|---|---|---|---|---|---|---|---|
| women: A systematic Review<br><br>**Country:** United States of America<br><br>**Funding:** No funding<br><br>**Bias**: None noted | | the United States from 2010 – 2018. 10 studies chosen.<br><br>**Purpose:** to describe the scope and impact of mobile mammography programs in promoting mammographic screening participation among medically underserved women. | any low-income, under/uninsured, disadvantaged group.<br>African American: 6 studies<br>Hispanic: 5 studies<br>Appalachian: 1 study<br>American Indian: 1 study<br><br>**Setting:** Community Setting<br><br>**Exclusion:** Studies outside the United States<br><br>**Attrition:** Not applicable | reached underserved women.<br><br>**DV1:** Mammo adherence rates<br><br>**Definitions:** Underserved women: women with poor access to health care, have relatively low income, less education. | **Validity:** 2 reviewers extracted data from the studies, including screening guidelines, group targeted, sample size, adherence rate. | scientific literature. | rates. Adding PN may increase adherence rates. | mammo to reach underserved populations.<br><br>**Weakness:** Most of the studies were conducted in southern United States. The published studies exclude null or negative outcome studies.<br><br>Feasibility: Some users did not have insurance. 7/10 studies were run by university hospitals, limiting its generalizability**.**<br><br>**Application:** applicable to underserved areas, it is suggested with PN screening rates may increase |

Key: **BC** Breast Cancer, **CG** Control Group**, CMS** Centers for Medicare & Medicaid Services**, CPT** Current Procedural Technology**, CRC** Colorectal Cancer**, DV** Dependent Variable, **DX** Diagnosis, **EHR** Electronic Health Record**, F/U** Follow-up**, GEE** Generalized Estimating Equations**, HBM** Health Belief Model**, HEDIS** Healthcare Effectiveness and Data Information Set, **HHS** Health and Human Services**, HS** High School**, Hx** History**, IBS** Irritable Bowel Syndrome, **IG** Intervention Group**, IV** Independent Variable, **IT** Information Technology, **Mammo** Mammogram**, MI** Motivational Interviewing**, NIH** National Institute of Health**, PB** Population-based**, PN** Patient Navigator**, PNMUA** Patient Navigation in Medically Underserved Areas**, PSA** Prostate Specific Antigen**, RTC** Randomized Control Trial, **V** versus

# Appendix A

## Table A2

*Synthesis Table*

| **Author** | Braun | Champion | Marguiles | Molina | Nelson | Okuhara | Percac-Lima | Phillips | Slater | Vang |
|---|---|---|---|---|---|---|---|---|---|---|
| **Year** | 2015 | 2020 | 2019 | 2018 | 2020 | 2018 | 2016 | 2010 | 2018 | 2018 |
| **LOE** | II - RCT | II - RCT | II - RTC | IV – RTC Longitudinal | I – Meta-Analysis | IV – RTC Longitudinal | II - RTC | II - RTC | II – RTC | I – Systematic Review |
| **Demographics** | | | | | | | | | | |
| *Age (Mean y.o.)* | 68.4 | 58.7 | 54.4 | 50-74 | | 49 | 57 | 60 | 58 | |
| *Female* | 53% | 100% | 100% | 100% | | 100% | 100% | 100% | 100% | 100% |
| *Sample Size* | 488 | 692 | 49 | 2,536 | 37 Studies | 215 | 1,626 | 3,895 | 22,113 | 10 Studies |
| *Primary Care* | X | X | X | X | X | X | X | X | X | |
| *Other* | | | X | | X | X | X | | | X |
| **Measurement Tool** | | | | | | | | | | |
| *Insurance Claims* | X | | X | | | X | | X | X | |
| *Self- Report* | X | X | | | | | | | | |
| *Medical Reports* | | X | X | X | | | X | X | | |
| **Intervention** | | | | | | | | | | |
| *Letters* | X | X | | X | X | X | X | X | X | |
| *Telephone* | X | X | | X | X | | X | X | X | |
| *Schedule appointment* | X | | | | X | | | | | |
| *Counseling/Education* | | | X | | X | | | | | |
| *Mail FBOT Kit* | | | | | X | | X | | | |
| *Same Day Appointment* | | | X | | | | | | | |
| *Mobile Mammogram* | | | | | | | | | | X |
| **Outcomes** | | | | | | | | | | |
| *BC Screening* | ⬆ | ⬆ | ⬆ | ⬆ | ⬆ | ⬆ | ⬆ | ⬆ | ⬆ | ⬆ |
| *CRC Screening* | ⬆ | ⬆ | | | ⬆ | | ⬆ | | | |
| *Cervical Cx Screening* | ⬆ | | | | ⬆ | ⬆ | | | | |
| *PSA Screening* | ⬆ | | | | | | | | | |

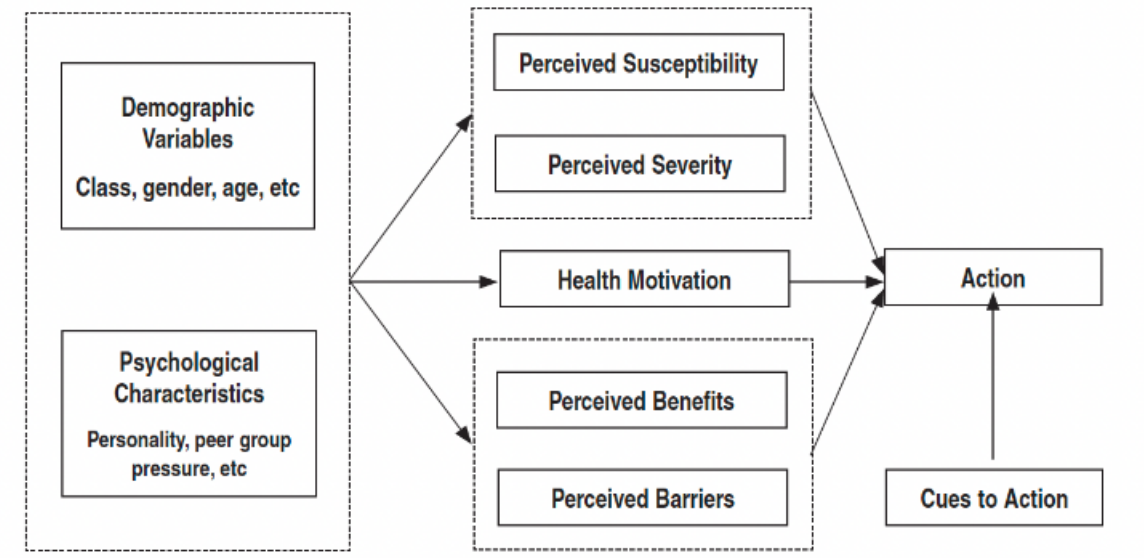
Key: **BC** Breast Cancer, **Cx** Cancer, **CRC** Colorectal Cancer, **FOBT** Fecal Occult Blood Test, **LOE** Level of Evidence

## Appendix B

## Models and Frameworks

**Figure B1.**

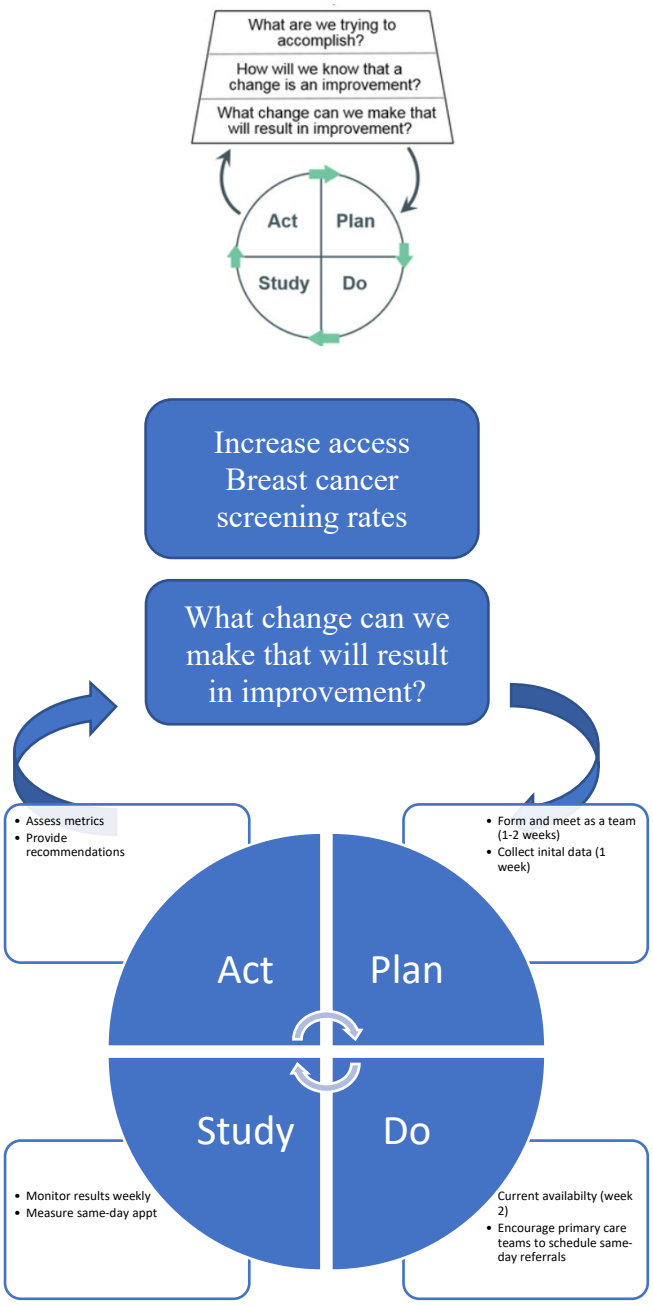
*Health Belief Model*




Janz & Becker (1984). The health belief model: A decade later. *Health Education Quarterly, 11*,1-47.

**Figure B2.**

*Model for Improvement*

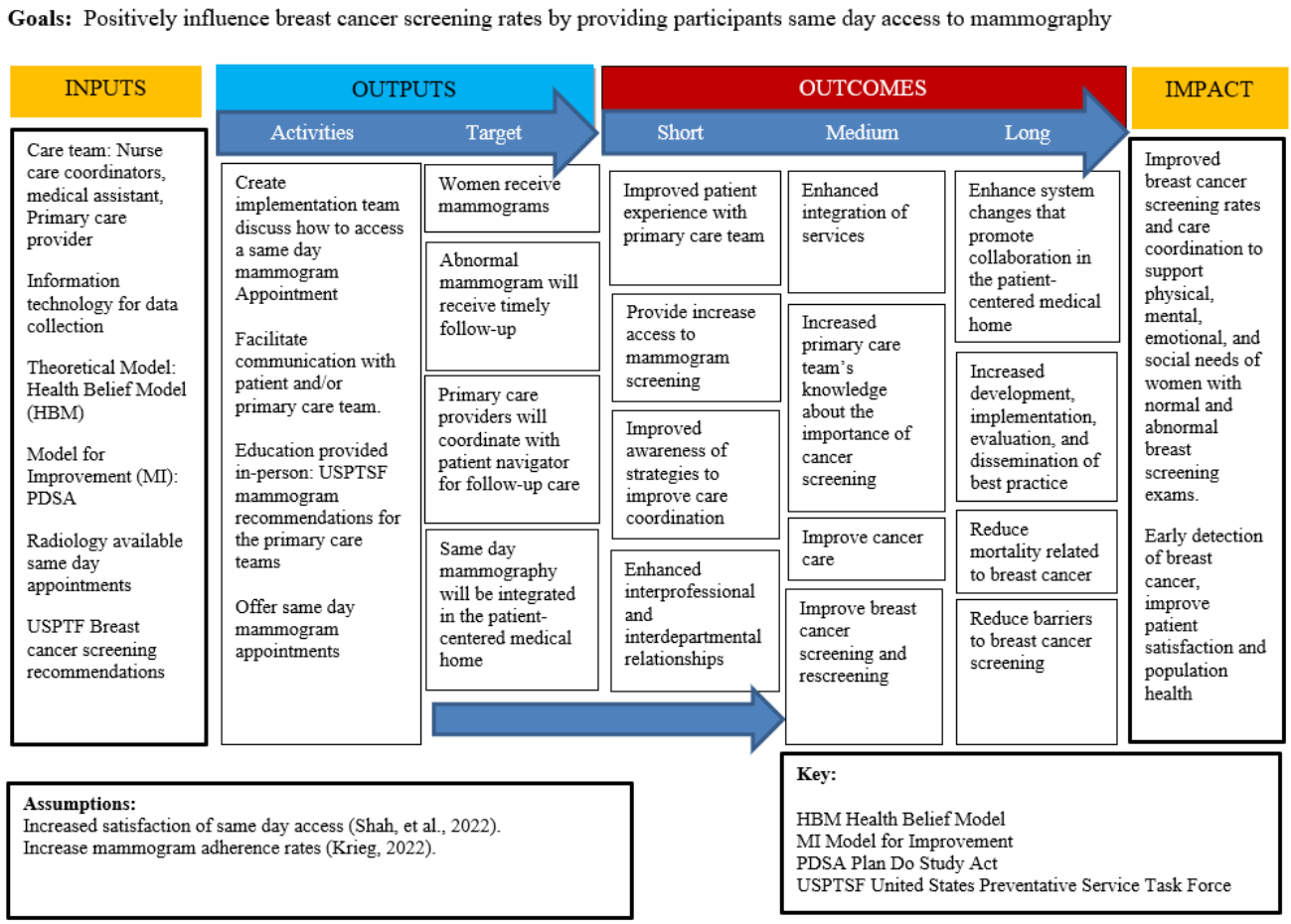



Institute of Healthcare Improvement (IHI) Model for Improvement (2019).

# Appendix C

## Figure C1.

*Logic Model*



# Appendix D

## Approval Letters



**DATE:** July 28, 2023

**TO:** Lapriel Dia, MHI, BSN – ASU Doctor of Nursing Student/Project Leader
Chief Nursing Officer

**FROM:** Dr. James Darragh & Dr. Yvonne Lees
Chair, SCAHC Institutional Review Board (IRB) & SCAHC IRB Member

**RE:** Expedited IRB Review Protocol ***#2023-3***, "Impacting mammogram access in rural Arizona: A patient-centered approach"
***Approved as exempt protocol for one-year on consensus: July 27, 2023***

This research as crossed reference with the SCAHC IRB Policy and Procedure is exempt from continuing IRB review under 45 CFR 46.104 this study protocol ***does not*** meet the criteria for human subject research. In accordance to SCAHC IRB Policy and Procedure page 19 "c. Reviewers: Expedited reviews shall be conducted by one (1) SCAHC IRB as Primary Reviewer and the IRB Chair." There was no request for full IRB consensus.

The Principal Investigator is responsible with the study protocol and compliance, any significant proposed changes that may affect this expedited IRB review status of the research and study protocol must be submitted to the SCAHC IRB for review and approval prior to their implementation. As this study purpose is to investigate how a team approach to breast cancer screening affects adherence rates by offering same day mammogram appointments. With the goal for the primary care team is to recommend and offer same day mammogram services, as a part of the patient centered medical home with the objective to increase breast cancer screening for women in rural Arizona. The care team will facilitate same day mammogram with the patient and radiology department. The project will begin in the Fall 2023 and will last 6-week with a potential outcome to imbed this practice in current process. Lastly, the data will be shared by project leader to primary investigator; the organization; submitted to; and archived by Arizona State University digital repository.

Any questions related to IRB review and determination may be directed to Board Chair james.darragh@scahealth.org.

Attachments:
1. Project Summary

cc: SCAHC IRB Board Members
SCAHC Ex Officos
file

ASU Knowledge Enterprise Development

EXEMPTION GRANTED

Jacqueline Medland
EDSON: DNP
-
Jacqueline.Medland@asu.edu

Dear Jacqueline Medland:

On 8/15/2023 the ASU IRB reviewed the following protocol:

| | |
|---|---|
| Type of Review: | Initial Study |
| Title: | Impacting Breast Cancer Screening Rates in Rural Arizona: A Patient-Centered Approach |
| Investigator: | Jacqueline Medland |
| IRB ID: | STUDY00018429 |
| Funding: | None |
| Grant Title: | None |
| Grant ID: | None |
| Documents Reviewed: | • CITI Training Cetificate, Category: Non-ASU human subjects training (if taken within last 3 years to grandfather in);<br>• IRB Social Behavioral Protocol_final 03.03.2023 .docx, Category: IRB Protocol;<br>• Mammo_ Exempt IRB Review_09.08.2023.pdf, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc);<br>• Mammo_DataCollectionForm_09.08.2023.pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions);<br>• Mammo_LetterOfSupport.CEO_09.08.2023.pdf, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc);<br>• Mammo_LOS.SCAT.Chairman_09.08.2023.pdf, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc);<br>• Mammo_PinkCard_09.08.2023.pdf, Category: Recruitment materials/advertisements /verbal scripts/phone scripts;<br>• Mammo_Procedure_09.08.2023.pdf, Category: Technical materials/diagrams; |

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (4) Secondary research on data or specimens (no consent required) on 8/15/2023.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

If any changes are made to the study, the IRB must be notified at research.integrity@asu.edu to determine if additional reviews/approvals are required. Changes may include but not limited to revisions to data collection, survey and/or interview questions, and vulnerable populations, etc.

Sincerely,

IRB Administrator

cc: Lapriel Dia

# Appendix E

## Figure E1.

*Chart Audit Tool*

Impacting Breast Cancer Screening in Rural Arizona: A patient-centered approach

Chart Audit

| ID Number | Date | Age | Same Day | Made Appt | Refused | Reason for refusal | Date Completed | Notes |
|---|---|---|---|---|---|---|---|---|
| 100 | | | | | | | | |
| 101 | | | | | | | | |
| 102 | | | | | | | | |
| 103 | | | | | | | | |
| 104 | | | | | | | | |
| 105 | | | | | | | | |
| 106 | | | | | | | | |
| 107 | | | | | | | | |
| 108 | | | | | | | | |
| 109 | | | | | | | | |
| 110 | | | | | | | | |
| 111 | | | | | | | | |
| 112 | | | | | | | | |
| 113 | | | | | | | | |
| 114 | | | | | | | | |
| 115 | | | | | | | | |
| 116 | | | | | | | | |
| 117 | | | | | | | | |
| 118 | | | | | | | | |
| 119 | | | | | | | | |
| 120 | | | | | | | | |
| 121 | | | | | | | | |
| 122 | | | | | | | | |
| 123 | | | | | | | | |
| 124 | | | | | | | | |
| 125 | | | | | | | | |

*Reason for refusal: Transportation, not interested, scheduling, childcare, etc.*

IRB Approval # _____

Data Entry _____ Data Validation _____ Data Analysis _____

## Appendix F

**Figure F1.**

*Pink Card- Informational Tool*

Have you completed your breast cancer screening?

5 Reasons to get a Mammogram

- Breast cancer screening saves lives
- This test helps find breast lumps early
- Risk of breast cancer increases with age
- It takes about 20 minutes
- If you do it, others will do it too.

Make an appointment today.

Screening available Monday through Thursday, 7:00 am to 4:00 pm

## Appendix G

**Table G1.**

*Descriptive Analysis*

*Frequency Table for Nominal Variables*

| Variable | *n* | *%* |
|---|---|---|
| Made Appointment | | |
| No | 35 | 53.03 |
| Yes | 31 | 46.97 |
| Reason | | |
| No Show Mammo | 3 | 4.55 |
| Did not want to wait | 1 | 1.52 |
| Chest wall pain | 1 | 1.52 |
| Recent rib fracture | 1 | 1.52 |
| Comorbidities incl dementia | 1 | 1.52 |
| Comorbidities | 6 | 9.09 |
| Wait until she is 50 | 1 | 1.52 |
| No Reason provided | 22 | 33.33 |
| Will do w/ Women's | 1 | 1.52 |
| Issue now, later | 1 | 1.52 |
| Comorbidities | 1 | 1.52 |
| Comorbidities - Hemodialysis | 1 | 1.52 |
| Not interested - Scared | 1 | 1.52 |
| Same Day Mammo | 1 | 1.52 |
| Result | | |
| Neg | 19 | 28.78 |
| Not Addressed | 23 | 34.85 |
| No Show | 13 | 24.24 |
| Decline | 11 | 16.67 |
| Provider Gender | | |
| Female | 33 | 50.00 |
| Male | 33 | 50.00 |

*Note.* Due to rounding errors, percentages may not equal 100%.

*Summary Statistics Table for Interval and Ratio Variables*

| Variable | *M* | *SD* | *n* | Min | Max |
|---|---|---|---|---|---|
| Age | 59.02 | 8.88 | 66 | 41.00 | 74.00 |