Increasing Breast Cancer Self-Awareness and Screening in a Vulnerable Population through Faith-based Community Outreach

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Abstract

Background and Review of Literature: Breast cancer is one of the leading cancer diagnoses for women in the United States. Certain vulnerable populations are at an increased risk for breast cancer mortality, including homeless and African American women. Providing healthcare navigation, cancer education, and connecting with faith-based communities has shown to increase cancer screening rates and knowledge in these vulnerable populations.

Purpose: The purpose of this QI project was to provide breast cancer screening education and access to care with the goal of increasing breast cancer screening rates and breast self-awareness among at-risk women in a midwestern Michigan community attending faith-based organizations.

Methods: The project was implemented at three different faith-based communities, including a community soup kitchen serving homeless people and two predominantly African American churches. An educational presentation was created to deliver tailored breast cancer information. Participants were also provided the opportunity to be enrolled for a free mammogram.

Implementation Plan/Procedure: The intervention was delivered virtually via a PowerPoint presentation on a secure zoom session. Enrollment forms were provided for eligible participants to be screened with a mammogram. Participant's attitudes, knowledge, and confidence towards breast cancer screening were measured before and after the intervention with surveys.

Implications/Conclusion: A statistically significant increase in participant's knowledge regarding breast cancer screening was found among the 15 total participants. This project demonstrates that education in conjunction with faith-based communities can increase breast cancer knowledge and screening in vulnerable populations to reduce breast cancer mortality.

Keys words: Breast Cancer, Breast Cancer Screening, Vulnerable Populations, Homeless, African American

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Breast Cancer Self-Awareness and Screening

Cancer continues to be ranked as one of the leading causes of death within the United States (Heron, 2019). Approximately 1.8 million people will be diagnosed with cancer in 2020 (National Cancer Institute, 2020). This threat is significantly increased in the homeless and vulnerable populations with cancer mortality rates up to 50% greater (Andersen et al., 2019; Asgary, 2018; Asgary, Garland, & Sckell, 2014; Asgary et al., 2016). Breast cancer mortality rates are similarly doubled in women who are homeless when compared to the general population (Festa et al., 2020).

A lack of cancer screening, lack of knowledge regarding breast cancer, and absence of a medical home have all been reported as possible root causes for the increased breast cancer mortality rates in vulnerable populations (Asgary et al., 2015). It is imperative to address these root causes to reduce the morbidity and mortality of breast cancer among these socially disadvantaged populations. The Centers for Disease Control and Prevention (CDC) suggests implementing community outreach measures with interventions aimed at overcoming the structural barriers that many disadvantaged populations face (Community Preventive Services Task Force, 2016). Creating trusting partnerships within communities to assist women with healthcare navigation and education of breast cancer has been effective in increasing mammography rates among minority and medically underserved populations (Wallington et al., 2018). Community engagement to improve breast cancer screening in ethnic minorities has also been expanded to include faith-based organizations (Allen et al., 2014). This paper describes a quality improvement project that sought to increase mammography screening and improve breast cancer knowledge through community outreach within a population of vulnerable women attending a faith-based community.

Background & Significance

Breast cancer is one of the leading cancer diagnoses after non-melanoma skin cancer with approximately 276,480 women being diagnosed each year (American Cancer Society, 2020a). Breast cancer continues to remain a threat of morbidity and mortality to all women in the United States (U.S. Department of Health and Human Services [HHS], CDC, & National Cancer Institute, 2019). As the leading cancer diagnosis for women in the U.S., education and secondary prevention measures are imperative for early identification and intervention of breast cancer to decrease morbidity and mortality (HHS et al., 2019). Several health organizations, including the American Cancer Society and the U.S. Preventive Services Task Force, provide published guidelines endorsing breast cancer screening to address breast cancer mortality (Siu, 2016; Oeffinger et al., 2015).

The homeless in America are a unique population that pose a higher risk of death from chronic health conditions, including cancer (Holowatyj et al., 2019). Among urban homeless populations, the cancer death rate was found to be 50% greater than the general population cancer mortality rate (Baggett et al., 2015; New York City Departments of Health and Mental Hygiene and Homeless Services, 2005). Furthermore, cancer diagnoses in the homeless population may be diagnosed at a more advanced stage, leading to poorer health outcomes and increased mortality (Holowatyj et al., 2019). A lack of cancer screening among the homeless population has been diffusely reported as a contributing factor to increased cancer mortality (Asgary, 2018; Asgary, Garland, & Sckell, 2014; Asgary et al., 2016; Chau et al., 2002).

African American women represent an additional population at-risk for breast cancer. Despite improvements in early detection and treatment of breast cancer, African American women have the highest breast cancer mortality rate in the U.S. (CDC, 2016). Furthermore,

African American women are 40% more likely to die from breast cancer when compared to white women (American Cancer Society, 2020b). These women are twice as likely to die when over age 50 (American Cancer Society, 2020b). Triple-negative breast cancer (TNBC), a more aggressive form of breast cancer, is also more common in African American women (Breast Cancer Prevention Partners, 2020). The increased breast cancer mortality rate of African American women can be contributed to diagnosis at later stages, increased rates of TNBC, and prevalence of risk factors such as obesity and other comorbidities (American Cancer Society, 2019).

In addition to a personal psychological burden, cancer poses a large financial burden at the individual and population levels. Cancer remains one of the top five most costly conditions in the U.S. population (Agency for Healthcare Research and Quality [AHRQ], 2015). For individuals, cancer led to the highest average expenditure per person of all diseases from 2002 to 2012, exceeding the costs of heart disease (AHRQ, 2015). In comparison to the average population, cancer patients can have up to four times higher mean expenditures per person (Park & Look, 2019). According to Forbes magazine, the estimated cost of medical expenditures for breast cancer alone in the United States was expected to reach $16.5 billion in 2020 (Seegert, 2020). The advanced practice registered nurse (APRN) holds the responsibility to address the mortality rate and financial burden of cancer. With a clear disparity in cancer survival among the homeless and African American populations, the APRN must identify unique strategies to promote breast cancer screening. One avenue the APRN can utilize to promote health is community outreach in disadvantaged populations (Murphy et al., 2015; Zazworsky & Johnson, 2014).

Another avenue that can promote community health is the partnership of faith-based organizations with disadvantaged populations. A cancer center in central Florida successfully increased cervical cancer screening in a low income rural Hispanic population through a partnership with the community's faith-based center (Luque et al., 2011). Furthermore, HHS (2020) has recognized the creative partnerships that exist between public health and faith-based organizations. The Center for Faith and Opportunity Initiatives, an HHS Partnership Center, seeks to improve the health of communities by addressing topics such as childhood obesity in partnership with local faith-based organizations (HHS, 2020). These partnerships demonstrate the unique connection between faith-based organizations and health promotion.

Problem Statement

Promotion of cancer screening in ethnic minority and socially disadvantaged populations through community organizations are well studied and demonstrated to be successful (Allen et al., 2014; Luque et al., 2011; Nguyen & Belgrave, 2014). Additionally, several studies report interventions to improve cancer screening in homeless or vulnerable women (Asgary, Naderi, & Wisnivesky, 2017; Bharel et al., 2015; Heyding et al., 2005). However, a gap in the literature exists regarding the promotion of breast cancer screening in vulnerable populations through faith-based community outreach. The purpose of this project was to provide breast cancer screening education and access to care with the goal of increasing breast cancer screening rates and breast self-awareness among at-risk women in the downtown Lansing, Michigan community attending faith-based organizations.

Gap Analysis

Several tools are available to assist in identifying underlying factors or causes of an identified issue. For this quality improvement project, the Ishikawa model, or "fishbone

diagram" was used to address barriers leading to decreased mammography rates in homeless and vulnerable populations. Examining the current barriers leading to decreased mammography screening was essential in guiding and developing the project intervention.

After reviewing the literature, four main themes were identified including system-level barriers, health care providers, personal obstacles, and a gap in knowledge. In reviewing these themes, specific issues were identified and presented in the fishbone diagram (See Appendix A). Barriers identified at the system level included lack of transportation, lack of insurance or medical home, decreased access to care, and difficulty obtaining appointments (Asgary et al., 2015; Marshall et al., 2015; Mings & Mas, 2019; Mishra, DeForge, Barnet, Ntiri & Grant, 2012). This population may also lack an established primary care provider, which may affect the provider's understanding of the population's needs and barriers (Weinstein et al., 2015). Personal obstacles that were determined included embarrassment, personal hygiene, feelings of discrimination, fear of screening and results, as well as not wanting a male technician (Asgary et al., 2015; Marshall et al., 2015; Mings & Mas, 2019, Mishra et al., 2012; Weinstein et al., 2015). A lack of knowledge and resources regarding the importance of cancer screening was also reported (Asgary et al., 2015; Wells, Shon, McGowan & James, 2017; Mishra et al., 2012). Utilizing the fishbone diagram, a number of contributing factors were identified and were analyzed during the development of the intervention.

Evidence Based Quality Improvement Model

PDSA Tool

The Plan, Do, Study, Act (PDSA) cycle is an evidence-based tool to format the process of change or quality improvement (Institute for Healthcare Improvement [IHI], 2020). The PDSA cycle has been utilized in a variety of settings to improve the quality of healthcare including

inpatient hospital settings, outpatient clinics, and community outreach (Chin et al., 2004; Coury et al., 2017; Hallet & Hewison, 2012). One study described successfully implementing cycles of the PDSA model, along with the Chronic Care model, to improve performance measures in patients with Diabetes (Chin et al., 2004). The authors rapidly applied steps of the PDSA cycle to develop goals and outcomes, implement interventions, analyze their interventions and make necessary changes to achieve the best outcomes in patients with Diabetes (Chin et al., 2004)

The PDSA model involves setting aims, establishing measures, selecting changes, testing the changes, implementing changes, and spreading changes (IHI, 2020). The aim of the planning process is to set measurable goals specific to the described population and determine desired outcomes for later evaluation (IHI, 2020). The do process of the PDSA cycle focuses on implementing the change in the specified population (IHI, 2020). The study stage focuses on analyzing the success of the changes (Chin et al., 2004). The act stage includes implementing any changes to the intervention and maintaining these changes (IHI, 2020).

The PDSA tool was chosen as a framework for this community engagement quality improvement project as it encouraged the facilitators to continually assess and modify interventions that will most benefit the community. The outcomes for this project included increasing breast cancer knowledge and mammography rates within a vulnerable population of women. The PDSA cycle, in conjunction with information gathered from the literature review, assisted the Doctor of Nursing practice (DNP) students to plan the specified outcomes. The DNP students also utilized the “plan” step to meet with stakeholders, study the population of interest, create the educational presentation, and create evaluation tools. The “do” step included carrying out the education. The “study” step consisted of analyzing differences in participants pre- to post-surveys and the effectiveness of the educational presentation. In the final “act” step, the

DNP students implemented the modified education and provided resources to the population to maintain the implemented changes. A detailed description of the activities that were performed in each step of the PDSA cycle is described in the intervention section of this paper.

Health Belief Model

The Health Belief Model was utilized to guide the educational aspect of the project. This model seeks to explain one's health behaviors by recognizing the desire to avoid illness and the necessary action that will prevent a specified illness (LaMorte, 2019). An individuals' perceptions, including barriers to action, affect whether a person will utilize the cues to action to avoid illness (LaMorte, 2019). The Health Belief Model has been widely applied to both improving the behaviors of breast cancer screening in women and faith-based cancer screening interventions (Darvishpour, Vajari, & Noroozi, 2018; Hou & Cao, 2018; Masoudiyekta et al., 2018).

This quality improvement project aimed to guide homeless and at-risk women towards the "action" of receiving a mammogram and/or a breast exam. The Health Belief Model assisted in identifying the population's modifiable risk factors (socioeconomic class, age, gender, education level, etc.) and their perceptions of breast cancer risk. The cues to action focused on the interventions that were implemented to enhance the population's behavior of receiving a mammogram. See Appendix B for a detailed application of the Health Belief Model to this quality improvement project.

Synthesis of the Evidence

Search Strategies

A systematic literature search was conducted to examine the available literature and data on cancer screening and breast self-awareness in disadvantaged populations, including homeless

persons and ethnic minorities, and faith-based communities. To conduct the review, several searches were utilized in the CINAHL database, PubMed database, and google scholar. In addition, articles were identified by examining the reference list of selected studies. Homeless people were defined as populations who do not have a home, live in shelters or have previously been homeless. Socially disadvantaged populations were defined as low-income or at-risk ethnic minority groups, such as African American women. Faith-based communities were defined as populations that connected with any type of religious organizations, including churches and faith-based clinics. Studies published between 2005 and 2019 were considered for the literature review. A majority of the studies were observational in nature.

The literature search was conducted on eight different occasions. Key search terms included “cancer screening” AND “homeless*”, “cancer screening in the homeless population”, “breast cancer screen*” AND “homeless*”, “cancer” AND “screen” AND “homeless*”, “cancer screen*” AND “low-income”, “breast cancer screening” AND “African American” “breast cancer” OR “breast cancer screening” AND “African Americans” AND “Faith-based organizations” and "cancer screen* intervention" AND "low-income". When utilizing the search terms “cancer screening” AND “homeless”, a total of 53 articles were identified. The key search terms “breast cancer screening” AND “African Americans” yielded a total of 205 results. A similar search was conducted to obtain references addressing faith-based cancer screening interventions by using the key terms “faith-based” AND “cancer screening”, yielding 51 results.

Selection Criteria

Studies were selected based on their relevance to cancer screening and cancer self-awareness in women, including both breast and cervical cancers. Studies were excluded if the cancer screening interventions were for men only, studies were conducted outside the United

States, and studies were not reported in English. The initial selection of studies was based on the abstract and title. The number of studies was further narrowed by ensuring the concepts aligned with the original inclusion criteria and were published within the last 10 years with two expectations. Two hallmark studies published in 2005 and 2006 respectively provided evidence directly relating to the purpose of this quality improvement project, therefore both were included (Heyding et al., 2005; Matthews et al., 2006). A total of seventeen studies, see Appendix C, were included in the final review with the following identified themes: perceptions of cancer screening among homeless and socially disadvantaged individuals, interventions to increase cancer screening in homeless and socially disadvantaged populations, and interventions to increase cancer screening in faith-based communities.

Perceptions of Cancer Screening in Homeless and Socially Disadvantaged Populations

To begin addressing the disparity of cancer screening among the homeless and socially disadvantaged, it was imperative to gain the perspective of the population itself. Among the homeless surveyed in New York City, a number of individuals identified the following themes regarding cancer and cancer screening: a fear of being diagnosed with cancer, feeling of being at a higher risk for cancer compared to the general population, and reports of the importance of cancer screening (Asgary et al., 2015). Likewise, studies among disadvantaged and ethnic minority populations reveal similar perspectives including fear of a cancer diagnosis, the importance of routine screening, and wanting to care for oneself and live longer (Ogedegbe et al., 2005; Patel et al., 2014; Wells et al., 2017) The positive perceptions that socially disadvantaged people possess towards cancer screening discredits the popular belief that these individuals are not concerned about health risks such as cancer (Asgary et al., 2015).

Barriers to screening.

A lack of knowledge regarding specific cancers and their screening processes was well reported as a barrier to cancer screening among disadvantaged individuals (Asgary et al., 2015; Mings & Mas, 2019; Ogedegbe et al., 2005; Patel et al., 2014; Well et al., 2017). Both men and women reported concern regarding embarrassment and/or pain in relation to the screening process and women voiced specific concerns about hygiene cleanliness when having a pap smear (Asgary et al., 2015; Mings & Mas, 2019, Wells et al., 2017). Additionally, African American women reported fear of a cancer diagnosis because of a family history of cancer as a reason to avoid screening (Wells et al., 2017). Beyond a lack of knowledge and fear, system-level barriers often prevent individuals in obtaining appointments for screening (Asgary et al., 2015; Mings & Mas, 2019; Mishra et al., 2012; Ogedegbe et al., 2005; Patel et al., 2014). This barrier stems from a lack of a medical home, insurance coverage, and an overall lack of resources (Asgary et al., 2015; Mishra et al., 2012; Patel et al., 2014; Wells et al., 2017).

Women reported specific barriers that prevented them from obtaining screening for breast or cervical cancer including feelings of discrimination within the healthcare system, lack of social support systems, and a lack of time (Asgary et al., 2015; Ming & Mas, 2019; Patel et al., 2014; Weinstein et al., 2015; Wells et al., 2017). In addition, women reported difficulty in securing transportation for appointments and difficulty locating the screening facility as barriers to screening (Asgary et al., 2015; Mishra et al., 2012; Ogedegbe et al., 2005; Patel et al., 2014).

Specifically, within the homeless population, mental health played a role in screening practices. Women reported less concern with health promotion practices if a mental illness such as depression was present (Asgary et al., 2015). Additionally, homeless women who have experienced domestic violence reported fear that their screening tech could be a male (Weinstein et al., 2015). Within non-homeless at-risk women, additional reported barriers to screening

included competing priorities such as inability to find care for children or elderly and difficulty getting time off work (Ogedegbe et al., 2005; Patel et al., 2014; Wells et al., 2017). The aforementioned barriers often prevent socially disadvantaged women from successfully being screened for cancer.

Facilitators.

Providing education regarding the cancer screening process and cancer itself were reported as being helpful in facilitating participation in cancer screenings (Asgary et al., 2015; Mishra et al., 2012). In addition, providing incentives and transportation to screening sites was suggested (Asgary et al., 2015; Mishra et al., 2012; Weinstein et al., 2015). Incentives mentioned included bus cards, small gifts, or personal hygiene supplies (Asgary et al, 2015). Women of ethnic minorities, such as African American women, suggested specific education points to be a motivating factor. This information included the importance of screening for early cancer detection to reduce risk of death and specific lifestyle behaviors that increase risk of cancer (Wells et al., 2017). Beyond education and incentives, having a good support system and receiving advice from friends or family was suggested by individuals as playing an important role in obtaining cancer screening (Asgary et al., 2015; Ogedegbe et al., 2005; Weinstein et al., 2015; Wells et al., 2017). Homeless women also highlighted that friendly staff members were influential in their comfort level to participate in cancer screening (Weinstein et al., 2015). Low income and ethnic minority populations reported receiving advice from a medical personnel and observation of positive cancer-treatment related outcomes as facilitators to seek screening (Mishra et al., 2012 & Ogedegbe et al., 2005).

Interventions to Increase Screening in Socially Disadvantaged Populations

Several studies have examined the effects of implementing specific interventions to increase cancer screening in the targeted population (Asgary et al., 2017; Bharel et al., 2015; Heyding et al., 2005; Howard et al., 2015). It is vital to examine the feasibility and success of prior screening interventions to plan for future quality improvement projects within this socially disadvantaged population. Within these studies reporting interventions to increase cancer screening, two major themes were identified including education and healthcare navigation.

Education.

In three notable studies, specific education about cancer and the cancer screening process was described (Asgary et al., 2017; Bharel et al., 2015; Howard et al., 2015). In one study, education was provided to homeless women addressing the misconceptions surrounding breast and cervical cancer screening, the screening schedule process, what to expect before and after the screening, and how to communicate with coordinating providers (Asgary et al., 2017). Additionally, the education addressed potential screening results and subsequent care addressing those results (Asgary et al., 2017). Two studies reported providing culturally and literacy appropriate printed materials as part of their educational intervention to assist with screening education (Asgary et al., 2017; Bharel et al., 2015). A third study provided specific education regarding the higher risk of triple negative breast cancer among African American women (Howard et al., 2015). This study included comprehensive cancer education conducted by medical professionals that detailed breast cancer prevention, screening, diagnosis and treatment (Howard et al., 2015).

Healthcare navigation.

Assistance with healthcare navigation has also been studied to be a successful intervention in increasing cancer screening rates in homeless and socially disadvantaged women

(Asgary et al., 2017; Bharel et al., 2015; Heyding et al., 2005; Kreuter et al., 2016; Marshall et al., 2015). Navigation with making appointments and providing reminder calls or slips was the most widely reported intervention in both the homeless and disadvantaged populations (Asgary et al., 2017; Bharel et al, 2015; Heyding et al., 2005; Kreuter et al., 2016; Marshall et al., 2015). One study in the homeless population reported following up on missed appointments and providing patients post-screening with their results (Asgary et al., 2017). Additional interventions included assistance with transportation such as providing free Metro Cards, helping with directions to the screening site location, and accompanying patients to their screening appointments (Asgary et al., 2017; Heyding et. al., 2005; Marshall et al., 2015).

Faith-Based Interventions

The opportunities for improving population health in coordination with faith-based organizations are numerous, including outreach to underserved and special populations (Levin, 2016). Several studies have reported the unique opportunity to provide health education regarding cancer to ethnic minorities within faith-based communities (Allen et al., 2014; Hou & Cao, 2018; Luque et al., 2011; Matthews et al., 2006). In addition, the established trust existing through faith-based partnerships can facilitate connection with hard to reach and underserved populations to address cancer screening (Allen et al., 2014; Luque et al., 2011; Matthews et al., 2006).

Group education.

Group education is recommended by the CDC as one intervention to increase breast cancer screening (Community Preventive Services Task Force, 2016). Two faith-based studies and a landmark systematic review emphasized the importance of group education to present cancer and screening information (Allen et al., 2014; Hou & Cao, 2018; Matthews et al., 2006).

One study utilized both a combination of group and one-on-one education to deliver content focused on cancer risk factors, symptoms, and screening (Allen et al., 2014). The intervention also included interactive educational games such as bingo to deliver the information (Allen et al., 2014). Church-sponsored activities to further promote awareness such as integrating messages into church sermons and hosting informational chat groups was used in one study (Matthews et al., 2006). A common important aspect reported was the incorporation of religious themes within the education and reinforcement of the education by the church's pastor (Allen et al., 2014; Matthews et al., 2006). Paper materials, including bulletin reminders, and small media were also utilized to reiterate the topics covered in group education (Allen et al., 2014; Hou & Cao, 2018; Matthews et al., 2006). Group education is an effective intervention to increase cancer awareness and screening within faith-based communities (Allen et al., 2014; Hou & Cao, 2018; Matthews et al., 2006).

Trusted partnerships.

Several studies addressed the importance of trusted partnerships and engagement within a faith-based community to promote cancer screening (Allen et al., 2014; Hou & Cao, 2018; Luque et al., 2011; Matthews et al., 2006). The involvement of the church's pastor and other church leaders in the promotion of cancer screening was reported to increase likeness for the message to be received well by church attendees (Allen et al., 2014; Hou & Cao, 2018; Matthews et al., 2006). A trusted faith-based partnership with a local health center was reported to improve women's comfort level and break down cultural barriers to facilitate an increase in screening practices (Luque et al., 2011). Developing personal relationships with cancer health advocates within the church was reported by one study to increase an individual's likelihood of being screened (Matthews et al., 2006). The trust and personal relationships that exist among a

church community promote the acceptance of cancer and cancer screening messages among faith-based communities (Allen et al., 2014; Hou & Cao, 2018; Luque et al., 2011; Matthews et al., 2006).

Summary

The perspectives of the homeless and socially disadvantaged population reveal several individual and system-level barriers that may affect cancer screening rates (Asgary et al., 2015; Mings & Mas, 2019). When research studies address these known barriers by creating interventions that facilitate healthcare navigation and increased knowledge, a positive correlation is seen in cancer screening practices among homeless and socially disadvantaged women (Asgary et al., 2017; Bharel et al., 2015; Heyding et al., 2005; Kreuter et al., 2016; Howard et al., 2015). Education programs and establishing trusted relationships have also proven to be effective when addressing screening rates in communities through faith-based organizations (Allen et al., 2014; Luque et al., 2011; Matthews et al., 2006). The current literature has demonstrated that it remains essential to gain the perspective and trust of selected communities in order to plan successful interventions to increase cancer screening rates and knowledge. As this quality improvement project aimed to improve the knowledge, perceptions, and breast cancer screening practices of a socially disadvantaged population, it proved to be vital to survey the community's needs and barriers in order to plan successful interventions.

Goals and Expected Outcomes

In order to guide and evaluate this quality improvement project, the expected outcomes were clearly described. The main expected outcome for this project was to increase the percentage of at-risk women who have received a mammogram within the last year. At-risk women included homeless individuals and African American women. The second outcome was

to increase participant's knowledge regarding breast self-awareness and mammography screening practices. Specific and measurable goals were developed to guide the project towards meeting the expected outcomes. Objective data was collected in the form of surveys in order to assess whether the goals were successful in meeting the expected outcomes. The first goal was to increase the number of at-risk women in the Lansing community who have been screened for breast cancer with mammography within the last year by 20% as evidenced by enrollment in the Ingham County Health Department Breast and Cervical Cancer Control and Navigation Program (BC3NP) or through self-report by the end of March 2021. The second goal was to increase the at-risk women's knowledge of breast cancer and breast cancer screening as evidenced by a statistically significant increase in scores from a pre-survey to post-survey by the end of March 2021.

Methods

Community Description

The microsystem targeted for this quality improvement project was ethnic minority and homeless women who attend faith-based communities within a midwestern Michigan city. This microsystem exists as an extension of three local churches that serve an ethnically diverse and disadvantaged population. One of the churches hosts a weekly community soup kitchen and the other two churches serve a predominantly African American population. These faith-based organizations seek to serve their local communities and bring people to know Jesus (Pilgrim Rest Baptist Church, 2020; St. Luke Lutheran Church [SLLC] n.d.; Tabernacle of David Church, 2021).

The community kitchen serves the economically disadvantaged community, including many who are homeless. It is estimated that 50% of the population attending the community

kitchen is homeless (T. Sutton, personal communication, June 3, 2020). The Michigan Campaign to End Homelessness [MCTEH], a campaign existing for over 10 years, reports statistics regarding the homeless population in specified regions across Michigan. According to the campaign, in the region surrounding Lansing, an estimated 8% of the population was reported as homeless (MCTEH, 2018). The community kitchen is organized by the sponsoring church and supported by other area churches. One of the organizing pastors is a member of the Congolese community who attends the church and serves as a leader of this ethnic minority population. In addition, a "facilities manager" assists in the preparation of the community kitchen each week (St. Luke Lutheran Church, n.d.). In their efforts to support the community kitchen, these key leaders within the church carry out the mission of Jesus through service to others to support those living in poverty or homeless. The community kitchen also partners with a local medical clinic to offer healthcare services to attendees. The clinic seeks to serve the homeless population by delivering equal access to healthcare (Michigan State University, n.d.).

The two Baptist faith-based communities serve a predominantly African American population. As a whole, Lansing's population is 23.3% African American (MCTEH, 2018). At one of the Baptist churches, a health ministry leader organizes events within the church for health promotion. The second Baptist church has an associate pastor who organizes a women's group that discusses various topics relevant to the community. Both of these women are respected members of the church and served as trusted partners in this project implementation.

Ethical Considerations & Protection of Human Subjects

Michigan State University Internal Review Board (IRB) approval was obtained prior to initiating the DNP Project. The official IRB Determination Form was submitted as soon as the proposal was approved. The project was deemed exempt from full institutional review. Informed

consent with full disclosure of the projects' purpose was provided to participants prior to starting the pre-survey. Participants were included on a volunteer basis only.

To ensure safety regarding COVID-19, the DNP students did not have any physical contact with the participants. The education was delivered through a virtual format to enhance social distancing. In addition, it was imperative to address ethical considerations of the medically underserved population targeted for this quality improvement project. To further assist with access to care, the DNP students partnered with the Ingham County Health Department to offer additional resources and ensure sustainability of the quality improvement project.

Data Management Plan

To ensure this project remained HIPAA compliant and to respect the privacy of the participants, the pre-survey and post-survey did not include any personal identifiers. The survey data was secured on the Qualtrics Data Tool site with a password protected login on a password protected computer. No paper surveys were collected. The completed pre-surveys and post-surveys were paired utilizing IP addresses and no personal identifiers. After being paired, each survey was assigned a color to be used as an identifier when analyzed in an Excel file. The BC3NP forms were securely faxed to the Ingham County Health Department via a secure fax machine.

The zoom sessions utilized during this project were password protected. No recordings were created of the educational sessions in which participants attended. Participants, community liaisons and additional volunteers are not personally identified in any reports or publications of this project.

Setting Facilitators and Barriers

Utilizing a strength, weakness, opportunity, & threat (SWOT) analysis table can highlight the factors of a system that will affect its ability to improve and change (Ojala, 2017). As a vulnerable population, it was necessary to conduct a SWOT analysis when planning interventions to address breast cancer screening in the targeted population. The identification of both strengths and barriers helped guide the development of interventions. See Table D2 in Appendix D for a full description of the SWOT analysis.

Intervention and Data Collection Procedure

The original intent of this project was to implement the intervention at one site, the community soup kitchen, with a targeted population of homeless women. However, due to COVID-19 restrictions and a lack of participation at the original implementation event, the project pivoted to include two other sites including the two aforementioned Baptist churches. The following section details the project's implementation process and changes made utilizing the PDSA cycle. A timeline of the project's dates is included in Appendix E. A description of the project's budget is also included for reference in Appendix F.

Plan.

To prepare for implementation of the intervention, three family nurse practitioner students met with the community kitchen facilities manager via zoom to gain a better understanding of the day-to-day activity of the community kitchen. With this gathered information, the DNP students created culturally appropriate education in the format of a PowerPoint. Over the course of several days, the DNP students also created a pre-survey and post-survey utilizing elements of the validated tool *Breast Cancer Awareness Measure* (Breast CAM) to assess participants' knowledge, attitude, and confidence regarding breast cancer and screening both before and after the intervention (Cancer Research UK, 2009).

The DNP students planned to deliver the educational session to participants during the breast cancer awareness month of October. The presentation was planned to be facilitated through a secure zoom session to allow for Michigan State University IRB guidelines for research activities due to COVID-19 restrictions. The material focused on breast cancer risk factors, breast self-awareness, and the breast cancer screening process.

The DNP students connected with the Ingham County Health Department's BC3NP case manager to facilitate enrollment of participants in the program. If a participant enrolled, BC3NP would contact the participant personally to set up a mammography appointment. The DNP students would not be involved in assistance of appointments, only in assistance with application to the program. Two to three weeks prior to the implementation of the intervention, the DNP students provided fliers to the community advertising the educational opportunity. The community kitchen facilities manager served as a point of contact to sign women up for the education and pass out flyers.

Do.

The DNP students facilitated the education via zoom as planned in the month of October. In order to ensure social distancing, a tent was set up outside the community kitchen facility in which the participants received the education and partook in the surveys. A community kitchen volunteer assisted the participants with the process. Participants were instructed to visit the tent where the community kitchen volunteer was instructed to distribute the pre-survey to each participant. The pre-survey attempted to collect information including the participants' demographics and measured participants' current knowledge of breast cancer and breast cancer screening. Next, the community kitchen volunteer assisted the participant to log onto a secure zoom session on a computer provided by the church. After the educational session was complete,

the DNP students completed a risk analysis of the participant while on the zoom to determine mammogram eligibility. If the participant was eligible for a mammogram, the community kitchen volunteer provided the sign-up form for the participant to enroll in BC3NP if desired. Finally, a post-survey was distributed to assess participants' post knowledge and intention to participate in breast cancer screening.

Study.

The intent of this project was to collect data from the participants' surveys and record the number of participants who signed up for a mammogram with BC3NP. However, only one participant attended the intervention at the community soup kitchen. This participant did not fully complete the surveys as directed, however she did enroll in the BC3NP. The day after the intervention was implemented, the DNP students analyzed the implementation process and reasons for a lack of participation. The students determined that implementation of the intervention outside in cold weather, utilizing paper surveys, and targeting a population with lack of access to technology contributed to the poor participation. The students decided to implement the intervention at two additional sites, targeting another vulnerable population. As described in the community description section of this paper, the DNP students connected with two local Baptist churches to facilitate the next round of interventions.

Act.

After completing the PDSA cycle with the first implementation site, the DNP students made necessary changes to improve the intervention for the second two churches. The students coordinated with a respected leader of each Baptist church via zoom meetings to plan the interventions. For both the safety of the participants and group members, the surveys were

transitioned to an electronic format via Qualtrics Survey Tool. The educational aspect was still performed via a synchronous zoom session.

The educational session was delivered on two separate occasions for members of each of the Baptist churches. Electronic flyers were sent to each church two weeks prior to the intervention to advertise the event. The first intervention was implemented in December. Members of the church individually logged onto the secure zoom link within the comfort of their own homes. The leader of the church who the DNP students coordinated with was also on the zoom. The participants were provided a link to the pre-survey on Qualtrics and asked by the DNP students to fully complete the survey. After ten minutes, the DNP students started the educational session by sharing a PowerPoint over the zoom. Information regarding the BC3NP program was also provided at this time to the participants and the church leader to allow participants or other members within the church the ability to sign up for the program. The participants were then asked to follow a weblink to complete the post survey. After this was completed, the DNP students facilitated a time for discussion and questions in which participants were encouraged to talk freely. This entire intervention was repeated at the second Baptist church in the month of January.

Data was collected via the pre-survey and post-survey to assess changes in the participants knowledge, attitudes, and confidence towards breast cancer and breast cancer screening. The surveys were kept secure within the online portal in the Qualtrics Survey Tool with a secure login. The analysis section of this paper details the data analysis of the surveys.

Measurement Instruments

In order to measure the outcomes of this DNP Project, a pre-survey and post-survey were administered (Appendix G). The pre-survey consisted of six questions collecting information in

three separate sections including participants' knowledge, attitudes, and confidence towards breast cancer. The pre-survey also included five questions which addressed demographic information. As visible in Appendix G, the six questions addressing knowledge, attitudes, and confidence were set up as a Likert scale. The participants could choose an answer from the specified choices or choose not to answer. After the educational session was delivered, a post-survey was administered to assess change of participant's knowledge and beliefs, including their intention to be screened for breast cancer when eligible. The post-survey consisted of the same six questions from the pre-survey in order to analyze any improvement in knowledge, attitude, or confidence to be screened for breast cancer.

Data Analysis

The goal of this community-based quality improvement project was to increase breast self-awareness and breast cancer screening rates in a vulnerable, at-risk population. To analyze the success of this project, data was collected in several formats. The pre-survey and post-survey were utilized to analyze participant's knowledge, attitudes, and confidence regarding breast cancer and breast cancer screening. The pre-survey also collected demographic data. The number of participants who signed up for the BC3NP program to receive a mammogram was recorded to assess the project's overall goal. Finally, qualitative data was collected during the group discussion with participants in order to provide insight of participants' experiences and questions.

The electronic surveys were not paired within the Qualtrics tool prior to participants taking the surveys. The qualitative data was simply recorded on a word document by one of the DNP students during the discussion portion of the intervention. Prior to analyzing the data outcomes, the three DNP students met with a statistician to discuss the process of data analysis.

The DNP students discussed the problem of unpaired data within the Qualtrics database. The statistician recommended utilizing IP addresses to pair the data and then to subsequently run paired T-tests to analyze differences between the pre-survey and post-survey.

At the first project implementation at the community kitchen site, only one participant volunteered for the intervention. However, this participant did not speak English and did not stay to fully complete the data collection process. The participant did not complete the pre-survey or the post-survey, however the DNP students were able to assist the participant in filling out the BC3NP program by utilizing google translate.

At the second implementation site, six participants attended the intervention. At the third implementation site, eight participants attended. The participants at both sites did complete pre-surveys and post-surveys, however no participants qualified to enroll in the BC3NP based on income. The data collected within Qualtrics at these two latter implementation sites was first examined by all three DNP students. As noted before, the surveys were not paired. In order to pair the participant's pre-surveys and post-surveys, IP addresses were utilized. Two DNP students worked together to pair the data. If a survey was not complete, the entire data pair was eliminated. In one case, a participant took the pre-survey twice and did not complete the post-survey. These two DNP students decided to utilize this data set as the time stamp taken for one survey was consistent with the time prior to the educational session and the time stamp taken for the second pre-survey was consistent with the time after the educational session. To assist with data pairing and to ensure accuracy, the students assigned a color to each IP address. After sorting out the data as described, eight sets of complete data were identified. The third DNP student reviewed the data pairings to ensure accuracy.

The six questions within the pre-survey and post-survey that utilized a qualitative Likert scale were converted to a quantitative Likert scale. Within each section of knowledge, attitudes, and confidence, the highest score was assigned to the qualitative item that described the desired outcome. For example, under the knowledge section participants were asked whether a described item was a warning sign for breast cancer. All of the items listed were indeed warning signs for breast cancer. The participant could answer "yes", "no" or "unsure". Yes, was assigned a score of 2, unsure was assigned a score of 1, and no was assigned a score of 0. The participants received a total score for the knowledge section based on how many points they received for each question. Questions from the attitudes and confidence sections were assigned numerical values in a similar fashion with the highest value representing the desired action or answer. Each participant was given a score for each section (knowledge, attitudes, and confidence) on their pre-survey, which was paired with their score from the post-survey. A paired T-test was used to analyze the scores of the eight paired data sets. Three separate T-tests were utilized for each section of the survey (knowledge, attitudes, and confidence). A mean and p-value were reported for each section.

Data Outcomes

Appendix H describes the demographic data. Participants' ages ranged from 24-74 years old. The majority of participants identified their ethnicity as African American. All of the participants reported having a primary care provider and only one participant had a history of breast cancer.

Statistical significance ($p=0.0166$) for participant's knowledge about breast cancer risk factors from pre-survey to post-survey was identified (CI: 0.95). The confidence and attitudes

sections did not approach significance from pre-survey to post-survey (See Appendix H). The number of participants to enroll in BC3NP to be screened by mammography was one total.

Discussion with participants during the implementation period revealed several themes. The themes included differences in cancerous and non-cancerous lumps, differences in 3-D and 2-D mammograms, and the increased risks of triple negative breast cancer in African Americans. The discussion also led to the health disparities and discrimination that African American women often face. The DNP students were able to actively engage with the participants during this discussion and encourage the participants to be advocates for one's health care.

Sustainability Plan

Further breast health education and cancer screening opportunities are necessary for women of health disparities, such as African Americans and homeless individuals. In order to continue to improve the knowledge of this population, health education can be provided by future doctoral nursing students or health care providers at the two Baptist churches and the community soup kitchen. Additional areas of the Lansing community could be targeted as well. Literature has shown that trusted partnerships between church leaders and community members has a positive impact on group education (Asgary et al., 2015; Ogedegbe et al., 2005; Weinstein et al., 2015). The success of this project's implementation within the two Baptists churches further demonstrates the importance of including trusted church leaders when delivering group health education in faith-based settings. It will be imperative that future educational interventions include coordination with leaders of the church in order to recruit participants and maintain a trusting relationship. A unique opportunity exists for health education directed towards the increased incidence of triple negative breast cancer in African American women.

Challenges remain in sustainability of health education and improving cancer screening practices at the community soup kitchen. Further education is needed and would best be conducted in person in the future. If an educational intervention needed to be delivered outside, it would be more successful during warmer months. Information about BC3NP from the Ingham County Health Department was provided to all three sites to allow participants and other members of the faith-based community to sign up for the program.

Implications for Nursing

As future advanced practice registered nurses, it is important to engage in lifelong learning. This includes furthering knowledge on vulnerable populations and increasing access to care. The homeless population remains a difficult population to reach for health care in general, but especially routine health screenings. It is likely this will only become more difficult with the COVID-19 pandemic as demonstrated in this project. Access to technology has made it feasible to deliver health care in the telemedicine format and has helped bridge this gap during the current COVID-19 pandemic. However, access to technology can limit telemedicine availability. Both patients and providers need to further their education on health disparities such as breast cancer and breast cancer screening in homeless and African American women.

As evidenced in this project, community-based quality improvement projects are viable options to reach patients without a primary care provider. By working with community stakeholders, such as the Ingham County Health Department and trusted members of the faith-based community, health care providers are able to connect with vulnerable populations and engage them in available resources. An example of this is the BC3NP through the local health department. Providers can help bridge this gap by educating themselves and patients on existing programs to facilitate their routine health screening. This is crucial for increasing access to care

for all patients, but especially vulnerable populations.

Recommendations & Conclusion

Breast cancer continues to be one of the leading causes of death among women within the United States (American Cancer Society, 2020a). The threat is significantly increased in vulnerable populations, including homeless and African American women (Baggett et al., 2015; CDC, 2016). Lack of knowledge regarding cancer and the screening process was found to be a barrier affecting the cancer screening rates among these vulnerable populations (Asgary et al., 2015). Interventions identified as playing an important role in increasing screening rates included education and the positive impact of trusted partnerships (Allen et al., 2014; Hou & Cao, 2018; Luque et al., 2011; Matthews et al., 2006). Specifically, education through faith-based organizations has been shown to improve cancer knowledge among these vulnerable populations (Allen et al., 2014).

This quality improvement project sought to provide breast cancer screening education and to increase access to care with the goal of increasing breast cancer screening rates and breast self-awareness among at-risk women in a midwestern Michigan community attending faith-based organizations. The intervention consisted of tailored breast cancer education and an opportunity for enrollment in a breast and cervical cancer control and navigation program providing free mammograms to women who qualified. After implementation of the intervention at three faith-based communities, a statistically significant difference in knowledge regarding breast cancer was found. One participant enrolled in the program to be screened for breast cancer and the remaining participants reported high confidence in their intention to receive a mammogram in accordance with current screening guidelines. This quality improvement project

affirms the current literature in which cancer education presented in faith-based communities has a positive impact on cancer knowledge and cancer screening practices.

Certain vulnerable groups of women, such as homeless women, continue to be a difficult population to reach. This challenge has been exacerbated by the COVID-19 pandemic and the transition of healthcare to telehealth. Further research and practice are needed to find creative solutions in reaching this population with a lack of access to technology. This project serves as a launching point for addressing breast cancer screening rates in both homeless and ethnic minority populations. The information gathered through this quality improvement project can be utilized to plan future interventions aimed at improving breast cancer education and self-awareness through community outreach.

References

Agency for Healthcare Research and Quality. (2015). Trends in the five most costly conditions among the U.S. civilian noninstitutionalized population, 2002 and 2012 [pdf file]. *Medical Expenditure Panel Survey.* Retrieved from https://www.meps.ahrq.gov/data_files/publications/st470/stat470.pdf

Allen, J. D., Pérez, J. E., Tom, L., Leyva, B., Diaz, D., & Idalí Torres, M. (2014). A pilot test of a church-based intervention to promote multiple cancer-screening behaviors among Latinas. *Journal of Cancer Education, 29*(1), 136–143. https://doi.org/10.1007/s13187-013-0560-3

American Cancer Society. (2019). Cancer facts and figures for African Americans 2019-2021. Retrieved from https://www.cancer.org/content/dam/caner-org/research/cancer-facts-and-statistics/cancer facts-and-figures-for-african-americans/cancer-facts-and-figures-for-african-americans-2019-2021.pdf

American Cancer Society. (2020a). Breast cancer statistics. Retrieved from https://www.cancer.net/cancer-types/breast-cancer/statistics

American Cancer Society. (2020b). Cancer disparities in the black community. Retrieved from https://www.cancer.org/about-us/what-we-do/health-equity/cancer-disparities-in-the-black-community.html

Andersen, S. W., Blot, W. J., Lipworth, L., Steinwandel, M., Murff, H. J., & Zheng, W. (2019). Association of race and socioeconomic status with colorectal cancer screening, colorectal cancer risk and mortality in southern US adults. *JAMA Network Open, 2*(12), e1917995. doi:10.1001/jamanetworkopen.2019.17995

Asgary, R., Garland, V., & Sckell, B. (2014). Breast cancer screening among homeless women of New York City shelter-based clinics. *Women's Health Issues: Official Publication of the Jacobs Institute of Women's Health, 24*(5), 529–534. https://doi.org/10.1016/j.whi.2014.06.002

Asgary, R., Sckell, B., Alcabes, A., Naderi, R., & Ogedegbe, G. (2015). Perspectives of cancer and cancer screening among homeless adults of New York City shelter-based clinics: A qualitative approach. *Cancer Causes & Control, 26*(10), 1429–1438. https://doi.org/10.1007/s10552-015-0634-0

Asgary, R., Alcabes, A., Feldman, R., Garland, V., Naderi, R., Ogedegbe, G., & Sckell, B. (2016). Cervical cancer screening among homeless women of New York City shelters. *Maternal and Child Health Journal*, *20*(6), 1143–1150. https://doi.org/10.1007/s10995-015-1900-1

Asgary, R., Naderi, R., & Wisnivesky, J. (2017). Opt-out patient navigation to improve breast and cervical cancer screening among homeless women. *Journal of Women's Health, 26*(9), 999-1003. doi: 10.1089/jwh.2016.6066

Asgary, R. (2018). Cancer screening in the homeless population. *Lancet Oncology, 19*(7), e344-e350. doi: 10.1016/S1470-2045(18)30200-6

Baggett, T. P., Chang, Y., Porneala, B. C., Bharel, M., Singer, D. E., & Rigotti, N. A. (2015). Disparities in cancer incidence, stage, and mortality at Boston Health Care for the homeless program. *American Journal of Preventive Medicine*, *49*(5), 694–702. https://doi.org/10.1016/j.amepre.2015.03.038

Bharel, M., Santiago, E. R., Forgione, S. N., Leon, C. K., & Weinreb, L. (2015). Eliminating health disparities: Innovative methods to improve cervical cancer screening in a

medically underserved population. *American Journal of Public Health, 105*(S3), S438-S442. doi:10.2105/ AJPH.2014.302417

Breast Cancer Prevention Partners. (2020). African American women and breast cancer. Retrieved from https://www.bcpp.org/resource/african-american-women-and-breast-cancer/

Cancer Research UK. (2009). Breast cancer awareness measure (Breast CAM) [pdf file]. Retrieved from https://reshare.ukdataservice.ac.uk/851845/37/BreastCAM.pdf

Centers for Disease Control and Prevention. (2016). Morbidity and mortality weekly report. Retrieved from https://www.cdc.gov/mmwr/volumes/65/wr/mm6540a1.htm

Chau, S., Chin, M., Chang, J., Luecha, A., Cheng, E., Schlesinger, J., … Gelberg, L. (2002). Cancer risk behaviors and screening rates among homeless adults in Los Angeles County. *Cancer Epidemiology, Biomarkers & Prevention, 11*(5), 431–438. Retrieved from https://cebp.aacrjournals.org/content/11/5/431.full-text.pdf

Chin, M.H., Cook, S., Drum, M.L., Jin, L., Gillen, M, Humikowski, C.A., … Schaefer, C.T. (2004). Improving diabetes care in midwest community health centers with the health disparities collaborative. *Diabetes Care*, *27*(1), 2-8. https://doi.org/10.2337/diacare.27.1.2

Community Preventive Services Task Force (2016). Cancer screening: Multicomponent interventions- Breast cancer. *Cancer.* Retrieved from https://www.thecommunityguide.org/findings/cancer-screening-multicomponent-interventions-breast-cancer

Coury, J., Schneider, J. L., Rivelli, J. S., Petrik, A. F., Seibel, E., D'Agostini, B., … Coronado, G. D. (2017). Applying the Plan-Do-Study-Act (PDSA) approach to a large pragmatic

study involving safety net clinics. *BMC Health Services Research*, *17*(1), 411. https://doi-org.proxy2.cl.msu.edu/10.1186/s12913-017-2364-3

Darvishpour, A., Vajari, S. M., & Noroozi, S. (2018). Can Health Belief Model predict breast cancer screening behaviors? *Open Access Macedonian Journal of Medical Sciences*, *6*(5), 949–953. https://doi.org/10.3889/oamjms.2018.183

Festa, K., Hirsch, A. E., Cassidy, M. R., Oshry, L., Quinn, K., Sullivan, M., & Ko, N. Y. (2020). Breast cancer treatment delays at an urban safety net hospital among women experiencing homelessness. *Journal of Community Health*, *45*(3). doi: 10.1007/s10900-019-00759-x

Hallett, N., & Hewison, A. (2012). How to address the physical needs of clients in a mental health setting. *Nursing Management*, *18*(10), 30–35. https://doi.org/10.7748/nm2012.03.18.10.30.c89

Heron, M. (2019). Deaths: Leading causes for 2017. *National Vital Statistics Report*, 68(6), 1-76. Retrieved from https://www.cdc.gov/nchs/data/nvsr/nvsr68/nvsr68_06-508.pdf

Heyding, R.K., Cheung, A.M., Mocarski, E.J.M., Moineddin, R., & Hwang, S.W. (2005). A community-based intervention to increase screening mammography among disadvantaged women at an inner-city drop-in center. *Women & Health*, *41*(1), 21-31. doi: 10.1300/J013v41n01_02

Holowatyj, A.N., Heath, E.I., Pappas, L.M., Ruterbusch, J.J., Gorski, D.H., Triest, J.A., …Schwartz, K.L. (2019). The epidemiology of cancer among homeless adults in metropolitan Detroit. *JNCI Cancer Spectrum*, *3*(1), pkz006. https://doi.org/10.1093/jncics/pkz006

Hou, S. I., & Cao, X. (2018). A Systematic review of promising strategies of faith-based cancer education and lifestyle interventions among racial/ethnic minority groups. *Journal of Cancer Education 33*(6), 1161–1175. https://doiorg.proxy1.cl.msu.edu/10.1007/s13187-017-1277-5

Howard, A., Morgan, P., Golesorkhi, N., Zuurbier, R., Fogel, J., Lively, M.R., … Withers, D.H. (2015). A community/faith-based breast health educational program focused on increasing knowledge about triple negative breast cancer among black women in Prince William County and surrounding areas. *The Journal of Chi Eta Phi Sorority, 59*(1), 6-10. Retrieved from http://search.ebscohost.com.proxy1.cl.msu.edu/login.aspx?direct=true&db=rzh&AN=124426300&site=ehost-live.

Institute for Healthcare Improvement (2020). Plan-Do-Study-Act worksheet. *Tools.* Retrieved from http://www.ihi.org/resources/Pages/Tools/PlanDoStudyActWorksheet.aspx

Kreuter, M. W., McQueen, A., Boyum, S., & Fu, Q. (2016). Unmet basic needs and health intervention effectiveness in low-income populations. *Preventive medicine*, *91*, 70–75. https://doi-org.proxy1.cl.msu.edu/10.1016/j.ypmed.2016.08.006

LaMorte, W.W. (2019). The health belief model. *Behavioral Change Models.* Retrieved fromhttps://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories2.html

Levin J. (2016). Partnerships between the faith-based and medical sectors: Implications for preventive medicine and public health. *Preventive Medicine Reports*, *4*, 344–350. https://doi.org/10.1016/j.pmedr.2016.07.009

Luque, J.S. Tyson, D.M., Markossian, T., Lee, J.H., Turner, R., Proctor, S. … Meade, C.D. (2011). Increasing cervical cancer screening in a Hispanic migrant farmworker community through faith-based clinical outreach. *Journal of Lower Genital Tract Disease*, *15*(3), 200–204. https://doi.org/10.1097/LGT.0b013e318206004a

Marshall, J. K., Mbah, O. M., Ford, J. G., Phelan-Emrick, D., Ahmed, S., Bone, L., … Pollack, C. E. (2015). Effect of patient navigation on breast cancer screening among African American Medicare beneficiaries: A randomized controlled trial. *Journal of General Internal Medicine*, *31*(1), 68–76. https://doi.org/10.1007/s11606-015-3484-2

Masoudiyekta, L., Rezaei-Bayatiyani, H., Dashtbozorgi, B., Gheibizadeh, M., Malehi, A. S., & Moradi, M. (2018). Effect of education based on Health Belief Model on the behavior of breast cancer screening in women. *Asia-Pacific Journal of Oncology Nursing*, *5*(1), 114–120. https://doi.org/10.4103/apjon.apjon_36_17

Matthews, A. K., Berrios, N., Darnell, J. S., & Calhoun, E. (2006). A qualitative evaluation of a faith-based breast and cervical cancer screening intervention for African American women. *Health Education & Behavior*, *33*(5), 643–663. https://doi.org/10.1177/1090198106288498

Michigan's Campaign to End Homelessness. (2018). Ending homelessness in Michigan: 2018 annual report [pdf file]. Retrieved from https://www.michigan.gov/documents/mcteh/2018-CTEH_AR_WEB_667374_7.pdf

Michigan State University. (n.d). Spartan street medicine. *College of Osteopathic Medicine.* Retrieved from https://com.msu.edu/current-students/student-life/clinical-outreach/spartan-street-medicine

Mings, J., & Soto Mas, F. (2019). Barriers to pap smear among homeless women at Albuquerque Healthcare for the Homeless. *Journal of Community Health*, *44*(6), 1185–1192. https://doi.org/10.1007/s10900-019-00704-y

Mishra, S. I., DeForge, B., Barnet, B., Ntiri, S., & Grant, L. (2012). Social determinants of breast cancer screening in urban primary care practices: a community-engaged formative study. *Women's Health Issues: Official Publication of the Jacobs Institute of Women's Health*, *22*(5), e429–e438. https://doi.org/10.1016/j.whi.2012.06.004

Murphy, M. P., Coke, L., Staffileno, B. A., Robinson, J. D., & Tillotson, R. (2015). Improving cardiovascular health of underserved populations in the community with Life's Simple 7. *Journal of the American Association of Nurse Practitioners*, *27*(11), 615–623. https://doi-org.proxy2.cl.msu.edu/10.1002/2327-6924.12231

National Cancer Institute. (2020). Cancer Statistics. Retrieved from https://www.cancer.gov/about-cancer/understanding/statistics

New York City Departments of Health and Mental Hygiene and Homeless Services. (2005). The health of homeless adults in New York City [pdf file]. Retrieved from https://shnny.org/uploads/Health_of_Homeless_Adults_in_NYC.pdf

Nguyen, A. B., & Belgrave, F. Z. (2014). Suc Khoe La Quan Trong Hon Sac Dep! Health is better than beauty! A community-based participatory research intervention to improve cancer screening among Vietnamese women. *Journal of Health Care for the Poor and Underserved, 25*(2), 605–623. https://doi.org/10.1353/hpu.2014.0078

Oeffinger K. C., Fontham E. T. H., Etzioni R. Herzig, A., Michaelson J. S., Shih Y. C., …American Cancer Society. (2015). Breast cancer screening for women at average risk:

2015 guideline update from the American Cancer Society. *JAMA*, *314*(15):1599–1614. doi:10.1001/jama.2015.12783

Ogedegbe, G., Cassells, A. N., Robinson, C. M., DuHamel, K., Tobin, J. N., Sox, C. H., & Dietrich, A. J. (2005). Perceptions of barriers and facilitators of cancer early detection among low-income minority women in community health centers. *Journal of the National Medical Association*, *97*(2), 162–170. Retrieved from https://pubmed.ncbi.nlm.nih.gov/15712779/

Ojala, M. (2017). Locating and creating SWOT analysis. Online Searcher, 41(1), 59-62. Retrieved from http://web.a.ebscohost.com.proxy1.cl.msu.edu /ehost/pdfviewer/pdfviewer?vid=5&sid=2eced4e1-e279-43b3-9350-551c5dd6d3a1%40sessionmgr4006

Park, J., & Look, K. A. (2019). Health Care Expenditure Burden of Cancer Care in the United States. *Inquiry: A Journal of Medical Care Organization, Provision and Financing*, 56, 46958019880696. https://doi.org/10.1177/0046958019880696

Patel, K., Kanu, M., Liu, J., Bond, B., Brown, E., Williams, E., … Hargreaves, M. (2014). Factors influencing breast cancer screening in low income African Americans in Tennessee. *Journal of community health*, *39*(5), 943–950. https://doi.org/10.1007/s10900-014-9834-x

Pilgrim Rest Baptist Church. (2020). About. Retrieved from https://prbclansing.org

Seegert, L. (2020). The financial burden of breast cancer. Retrieved from https://www.forbes.com/sites/nextavenue/2020/01/21/the-financial-burden-of-breast-cancer/#f9a84c34d217

Siu, A. L. (2016). Screening for breast cancer: U.S. Preventive Services Task Force recommendation statement. *Annals of Internal Medicine, 164*(4), 279-296. doi:10.7326/M15-2886

St. Luke Lutheran Church. (n.d.). About us. Retrieved from https://knowingjesus.org/about-us/service-schedule

Tabernacle of David Church. (2021). About us. Retrieved from https://todc.org/home

United States Department of Health and Human Services, Centers for Disease Control and Prevention, & National Cancer Institute. (2019). Leading cancer cases and deaths, female, 2016. *United States Cancer Statistics: Date Visualizations.* Retrieved from https://gis.cdc.gov/Cancer/USCS/DataViz.html

United States Department of Health and Human Services (2020). The center for faith and opportunity initiatives (Partnership Center). Retrieved from https://www.hhs.gov/about/agencies/iea/partnerships/index.html

Wallington, S., Oppong, B., Dash, C., Coleman, T., Greenwald, H., Torres, T., … Adams-Campbell, L. L. (2018). A community-based outreach navigator approach to establishing partnerships for a safety net mammography screening center. *Journal of Cancer Education, 33*(4), 782–787. https://doi.org/10.1007/s13187-016-1152-9

Weinstein, L. C., LaNoue, M., Hurley, K., Sifri, R., & Myers, R. (2015). Using concept mapping to explore barriers and facilitators to breast cancer screening in formerly homeless women with serious mental illness. *Journal of Health Care for the Poor and Underserved, 26*(3), 908–925. https://doi.org/10.1353/hpu.2015.0104

Wells, A. A., Shon, E. J., McGowan, K., & James, A. (2017). Perspectives of low-income African American women non-adherent to mammography screening: The Importance of

information, behavioral skills, and motivation. *Journal of Cancer Education: The Official Journal of the American Association for Cancer Education*, *32*(2), 328–334. https://doi.org/10.1007/s13187-015-0947-4

Zazworsky, D., & Johnson, N. (2014). It takes a village: a community partnership model in caring for the homeless. *Nursing Administration Quarterly*, *38*(2), 179–185. https://doi-org.proxy2.cl.msu.edu/10.1097/NAQ.00000000000000

Appendix A

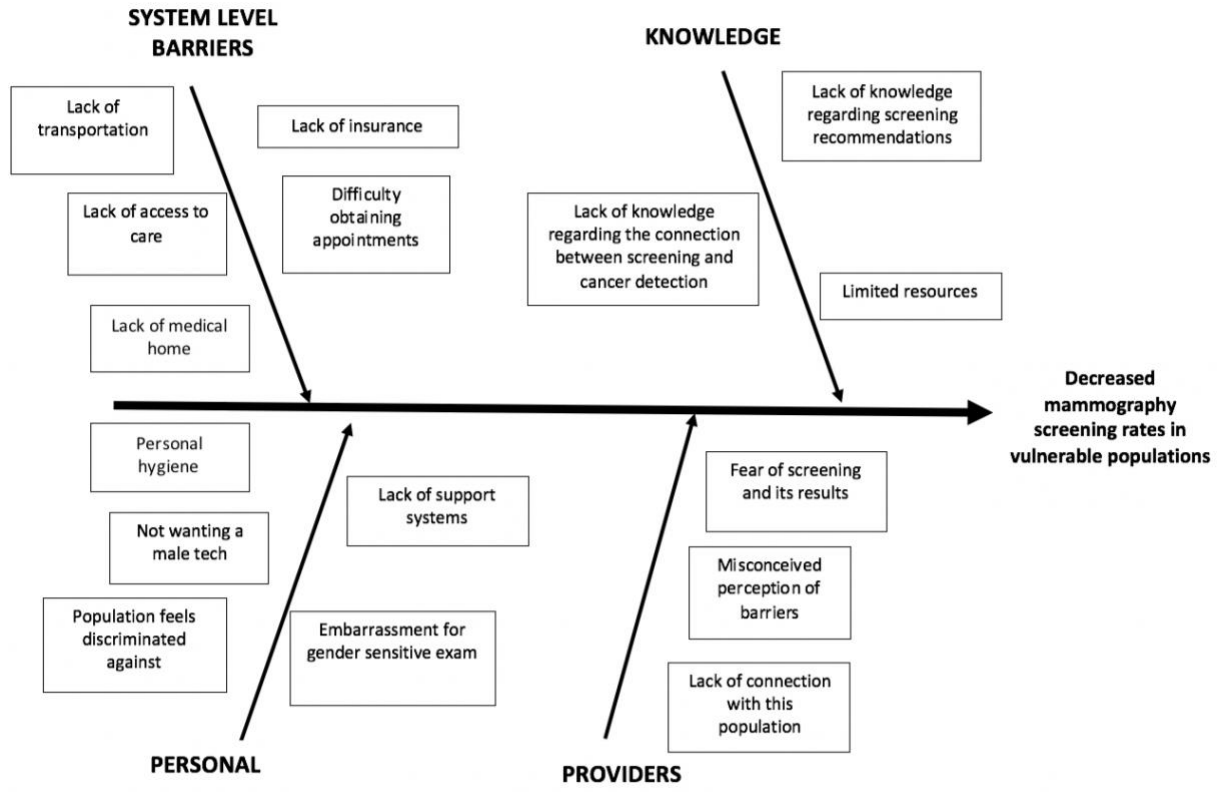

Figure 1. *Fishbone Diagram*

Appendix B

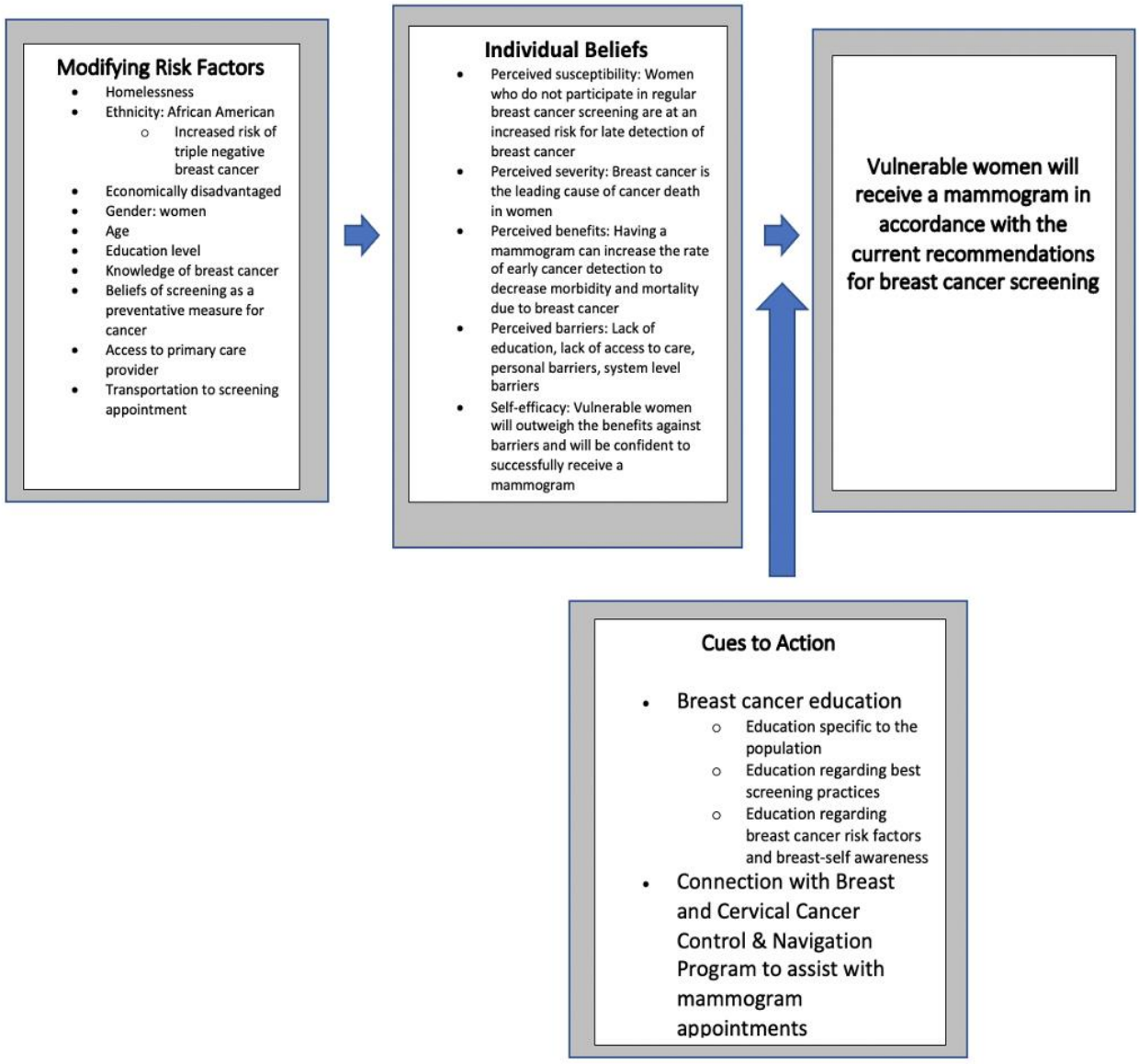

Figure 2. *The Health Belief Model: Increasing Mammography Screening Rates in Vulnerable Women*

Appendix C

Author/Title	Level of Evidence (quasi-exp?, Experimental ?)	Purpose of the project/research	Framework (if none indicate)	Results	How does this relate to your project?	Implications for Practice
Opt-Out Patient Navigation to Improve Breast and Cervical Cancer Screening Among Homeless Women Asgary, Naderi & Wisnivesky (2017)	Qualitative	"on-site patient navigator introduced to improve breast and cervical cancer screening among women who were homeless"	None	Breast ca screening completion: 88% Cervical ca screening completion: 83% Attrition rates: ● Breast: 7% ● Cervical: 10% 20% refused participation	Provides a successful intervention to increase breast ca screening rates	Use of patient navigator to deliver education, schedule screening appt, follow up Transportation bus passes provided to increase adherence to appts Navigator was bilingual minority female

A Community-Based Intervention to Increase Screening Mammography Among Disadvantaged Women at Inner-City Drop-in Center Heyding, Cheung, Mocarski, Moineddin, & Hwang (2005)	Cohort study	"To determine the effectiveness of a community-based intervention to increase the use of screening mammography among disadvantaged women at an inner city drop in center"	Behavioral Model for Vulnerable Populations	Pre int. mammogram rates: 4.7% Post int. mammogram rates: 29.2% (st. sig @ p=0.0001)	Provides example of successful intervention to increased breast ca rates	Local health care center held 3 mammogram appts open weekly for drop in center to utilize Participants offered luncheon followed by mammogram Women accompanied to the trips by staff member of drop in center

Eliminating Health Disparities: Innovative Methods to Improve Cervical Cancer Screening in a Medically Underserved Population Bharel, Santiago, Forgione, Leon, & Weinreb (2015).	Qualitative	To improve cervical cancer screening rates by implementing a systematic approach to incorporate women's preventative health quality improvement into the existing program	none	Statistically significant increase in cervical ca screening from 19% pre intervention to 50% post intervention (P<.001) Increased screening rates significant in all ages and races	Provides a 6-part intervention to increase cervical ca screening in homeless	Partnering homeless shelters with health care clinics Utilizing opportunities for other care to promote cervical ca screening Providing language appropriate appointment reminders at shelters via both print and telephone Screening education and brochures

Using Concept Mapping to Explore Barriers and Facilitators to Breast Cancer Screening in Formerly Homeless Women with Serious Mental Illness Weinstein, LaNoue, Hurley, Sifri, Myers (2015)	Qualitative (to plan for randomized control trial)	To examine barriers and facilitators of breast cancer screening specifically in formerly homeless women with serious mental illness using concept mapping	Preventative health Model	Mental health was not considered a barrier for many homeless women Support systems play a large role in completion of screening Women reported facilitating factors to include access to a peer counselor, receiving a gift, or combining the screening with another activity	Provides both barriers and facilitators that affect homeless women's decisions to be screened	Do not discount mental illness as a reason women do not get screened Ensure homeless women have support and receive friendly service Consider adding incentives for obtaining a mammogram

Perspectives of cancer and cancer screening among homeless adults of New York City shelter based clinics: A Qualitative approach Asgary, Sckell, Alcabes, Naderi, & Ogedegbe. (2015)	Qualitative	To explore the perspectives regarding cancer and cancer screening among homeless of New York City shelter based clinics in order to identify barriers of and potential strategies to improve screening	none	Men and women reported: ● Lack of screening counseling and opportunities ● Lack of information and guidance about ca screening and its importance (esp. older adults) ● Limited resources ● Fear of screening or its results ● Embarrassment ● Lack of transportation or directions on how to get to site	Provides perspectives from homeless men and women about the barriers and reasons for screening to assist in planning interventions	Provide education regarding the link between cancer and screening Address any reports fears or embarrassment prior to setting up screenings Provide free or funded screening Consider transportation when assisting with navigating the screening process

				Women alone reported: ● Lack of overall resources and support system ● Insurance issues ● Feeling of discriminatio n in health system		

Barriers to pap smear among homeless women at Albuquerque healthcare for the homeless Mings & Mas. (2019).	Qualitative (Cross sectional survey)	Explore common barriers to Pap smear test utilization among homeless women and the factors that may relate to cervical cancer testing in this population	none	Reported barriers by women of cervical ca screening ● Lack of time ● Difficulty obtaining an appointment ● Embarrassment for obtaining a pap smear (genital exam) Perceived barriers Lack of knowledge surrounding HPV, cervical ca, and screening process	Provides reported barriers of homeless women to plan interventions that overcome barriers	Facilitate screening for homeless by navigating appointments for screening and providing education regarding both breast cancer and breast cancer screening practices

A pilot test of a church-based intervention to promote multiple cancer-screening behaviors among Latinas. Allen, Perez, Rom, Leyva, Diaz, & Torres. (2014).	Qualitative	"Assess the feasibility, acceptability, and initial impact of a church-based educational program to promote breast, cervical, and colorectal cancer screening among Latinas"	Integrative Model of Behavior Prediction	24% increase in adherence with breast cancer screening 8% increase in adherence to all recommended screening tests for one's age 61% of women reported that it was "somewhat" or "very" helpful to talk to a peer health advisor 67% reported talking with a patient navigator or peer health advisor about health issues (specifically breast cancer screening and health insurance)	Provides a successful faith-based education intervention to promote cancer screening among Latinas	Integrate religious themes and messages into the intervention The peer health advisors who implemented the intervention were long time church members, which helped to culturally adapt health messages Pastor discussed cancer education and health themes in their sermons at least once a month Bible scripture and passages relevant to health promotion behaviors were posted throughout the church Single-cancer screening client reminder telephone scripts Mailing materials from RTIPS to address different cancer screening behaviors

Increasing cervical cancer screening in a Hispanic migrant farmworker community through faith-based clinical outreach. Luque, Tyson, Markossian, Lee, Turner, Proctor, Menard, & Meade. (2011).	Descriptive Retrospective Study	"To describe clinical outcomes of an outreach partnership between a cancer center and a faith-based outreach clinic offering gynecologic screening services in central Florida to increase cervical cancer screening adherence in a priority population of primarily Hispanic farmworker women."	None.	Time residing in the United States was significantly associated with adherence to cervical cancer screening: women who lived in the US for 6 or more years were more likely to meet the screening guidelines (85.9%) vs those who have lived in the US for 5 or less years (74.5%). Marital status was significantly associated with adherence with cervical cancer screening: women who were married were more likely to meet the screening guidelines (84%) compared to unmarried (68.8%).	Provides support of a successful partnership between an academic medical center and faith-based community organization in increasing cervical cancer screening rates in low minority women	Catholic Mobile Medical Service (CMMS) provided medical screenings and follow-up medical care by volunteer medical professionals

Perceptions of barriers and facilitators of cancer early detection among low-income minority women in community health centers. Ogedegbe, G., Cassells, A. N., Robinson, C. M., DuHamel, K., Tobin, J. N., Sox, C. H., & Dietrich, A. J. (2005)	Qualitative	"to explore through individual interviews the perceptions of barriers and facilitators of colorectal, cervical and breast cancer screening among 187 low-income, primarily minority women in four New-York-City-based community/migrant health centers"	PRECEDE-PROCEED framework	Reported barriers: Competing priorities, Esthetics, Fatalism, Fear of cancer diagnosis/screening procedure, Lack of knowledge, Loss of privacy/ embarrassment, Perception of good heath/ not needing test, Family discouragement, Knowledge of someone harmed by screening, Lack of medical recommendation, Cost of test, Lack of transportation, Language barriers Facilitators: Personal cancer hx, reassurance about pain, recommendation for women of age,	Provide perceived barrier and facilitators to cancer screening in economically disadvantaged population to assist in intervention development	Address barriers to assist in increasing screening rates in economically disadvantage population Provide advice and education regarding screening process Improve accessibility and affordability of screenings

				screening is routine, health reassurance, wanting to care for one's self, advice from family/friends, family hx of cancer, information from media, health professional, insurance, affordability of screening, convenient location		

Factors influencing breast cancer screening in low-income African Americans in Tennessee. Patel, K., Kanu, M., Liu, J., Bond, B., Brown, E., Williams, E., Theriot, R., Bailey, S., Sanderson, M., & Hargreaves, M. (2014).	Descriptive	"examines socio-demographic factors that influence decisions to use mammography and other breast cancer screenings in low-income African Americans."	No framework-utilized aspects of the Behavioral Risk Factor Surveillance System for survey	Reported obstacles: fear of cancer dx, lack of health insurance, cost, pain and discomfort of screenings, difficulty getting time off work, trouble remembering to schedule screening, not knowing where to get screened, transportation issues, finding childcare Other outcomes: Overweight women were 2.7 more likely to be screened with mammography compared to normal weight Women without health insurance were .29 times as likely to be screened	Provide barriers to screening in low-income population that can be analyzed when planning interventions	Assist women in overcoming barriers to improve screening rates Create opportunities for uninsured women to obtain screening or assist women in obtaining insurance

				compared to insured women		

Unmet basic needs and health intervention effectiveness in low-income populations. Kreuter, M. W., McQueen, A., Boyum, S., & Fu, Q. (2016)	Randomized control study	"to understand how these hardships may cluster and how the effectiveness of different health-focused interventions might vary across vulnerable population sub-groups with different basic needs profiles"	No framework-utilized aspects of the Behavioral Risk Factor Surveillance System for survey	Participants with more unmet needs and money needs benefited most from a navigator intervention compared to referral alone Participants with fewer basic unmet needs benefited equally from navigator intervention and print reminder	Provide examples of effective interventions to increase cancer screening in low-income populations	Providing assistance with healthcare navigation such as setting up referral, calling with appt reminders, and providing a health coach can assist in addressing health needs of low-income populations
A systematic review of promising strategies of faith-based cancer education and lifestyle interventions among racial/ethnic minority groups. Hou, S. I., & Cao, X. (2018).	Systematic review	"to examine and synthesize evidence-based strategies used and lessons learned from existing effective faith-based cancer screening intervention programs among racial minority groups"	None	In African American and Latina population, faith-based interventions that followed CDC guideline included: client reminders, small media, group education, one-on-one education, reducing out of pocket client costs, reducing	Provides overview of faith-based interventions used to increase ca screening; aligns with CDC's guidelines for interventions to increase ca screening	Interventions listed to specific ethnic populations can be implemented through faith-based community outreach programs to increase ca screening rates

				structural barriers (small media and group education most reported)		
A qualitative evaluation of a faith-based breast and cervical cancer screening intervention for African American women. Matthews, A. K., Berrios, N., Darnell, J. S., & Calhoun, E. (2006).	Qualitative evaluation	"to conduct a qualitative formative evaluation of a CDC REACH 2010 faith-based breast and cervical cancer early detection and prevention intervention for African American women living in urban communities."	"Train the trainer" model	Educational sessions and church activities are useful in increasing breast and cervical ca awareness Personal testimonies provide cues to action to be screened Reinforcement of educational message by pastor increases likelihood to trust information	Provides specific interventions to be utilized within the faith-based community kitchen to increase breast ca awareness	Interventions specific to African American women can be utilized through faith-based community outreach to increase breast cancer self-awareness and screening rates

A community/faith-based breast health educational program focused on increasing knowledge about triple negative breast cancer among black women in Prince William County and surrounding areas Howard, A., Morgan, P., Golesorkhi, N., Zuurbier, R., Fogel, J., Lively, M.R., … Withers, D.H. (2015).	Quasi-experimental (pretest and posttest design	"to educate black women on TNBC in Prince William County (PWC) and neighboring Stafford County in Virginia"	None	Statistically significant increase in knowledge regarding the health threats of triple negative breast cancer among black women from pretest to posttest after educational intervention	Provides framework for improving knowledge in ethnic minority population Combines both socially disadvantaged population and faith-based community to align with our project setting	Educational interventions specific to African American women to increase breast cancer knowledge Addresses culturally specific risks of an ethnic minority to encourage breast cancer self-awareness and screening knowledge Utilizes medical professionals to deliver cancer education

Effect of patient navigation on breast cancer screening among African American Medicare beneficiaries: A randomized controlled trial. Marshall, J. K., Mbah, O. M., Ford, J. G., Phelan-Emrick, D., Ahmed, S., Bone, L., … Pollack, C. E. (2015)	Randomized Control Trial	"to examine the effect of patient navigation on screening mammography among African American female Medicare beneficiaries in Baltimore, MD."	None	Statistically significant difference in control versus intervention group in the incidence of self -report mammogram screening	African American (AA) women in intervention group were provided assistance through healthcare navigation, which increase likelihood of receiving a mammogram Provides specific intervention to increase breast cancer screening in the AA population	When addressing breast cancer screening rates in the AA population, assistance with healthcare navigation such as accompaniment to appointments and phone call reminders is a feasible and effective intervention

Perspectives of low-income African-American women non-adherent to mammography screening: The importance of information, behavioral skills, and motivation. Wells, A. A., Shon, E. J., McGowan, K., & James, A. (2017)	Qualitative evaluation	To collectively understand how individual factors and barriers influence breast cancer screening in low-income African Americans	Information-motivation-behavioral skills model	Barriers to screening reported included competing priorities, time constraints, lack of medical insurance, being unemployed, transportation problems, caretaker demands Behavioral skills affecting screening included lack of knowledge on screening process and to prepare Motivation to be screened included knowing someone who died of cancer and wanting to live longer	Provides descriptive data on barriers and motivators to be screened for breast cancer within our targeted population Will include ways to overcome barriers in educational presentation	Provides specific barriers that need to be overcome when planning intervention to increase mammography rates in low income AA women

Social determinants of breast cancer screening in urban primary care practices: A community-engaged formative study Mishra, S. I., DeForge, B., Barnet, B., Ntiri, S., & Grant, L. (2012)	Qualitative study	" to learn from women who received care through urban community health center primary care practices about issues revolving around cancer and mammography screening"	Social Determinants of Health Perspective	Barriers to screening reported include pain experienced during a mammogram, procrastination, lack of insurance coverage, lack of access to local providers, transportation barriers Ways to overcome barriers reported include offering geographically accessible screening with nontraditional hours, social factors such as providing hope and social support Suggestions for education to increase knowledge reported include utilizing group education,	Provides barriers to address when planning our intervention, gives suggestions on the format for the planned educational intervention	Provides information for healthcare professionals to address when attempting to overcome barriers of mammography screening in AA population in urban communities Provides specific advice from the population at study on how to format an educational session to best reach them

				providing incentives, and group discussion		

Table C1. *Synthesis of Literature Articles*

Appendix D

Strengths	Opportunities
• Easily accessible at the community kitchen • Established medicine clinic within the kitchen may facilitate a more accepting nature of health education • Accessible screening resources within the community • Facilities manager to help coordinate the process • Well-trusted, safe space, and long-established community kitchen in the area	• To improve the participants' knowledge of breast cancer prevention through an educational program. • To improve the participants' screening rates in homeless women and economically disadvantaged population through facilitation of appointments and knowledge • To improve participants' awareness of community health resources • Decline in mortality rate for breast cancer within Ingham county
Weaknesses	Threats
• Lack of knowledge regarding cancer screening • Lack of access to healthcare • Lack of health insurance • Lack of resources to schedule appointments and for transportation to those appointments	• Barriers to transportation for screening appointments • Potential animosity towards screening • Cancellation of community kitchen days due to social distancing restrictions • Fear of screening and the results • Lack of consistency of attendance to the kitchen • Fear of interaction with unfamiliar healthcare providers • Barriers with technology • Inability to have direct contact with participants • Having to change implementation to occur over zoom

Table D2. *SWOT analysis of faith-based community sites*

Appendix E

Increasing Breast Cancer Self-Awareness and Screening in a Vulnerable Population through Faith-based Community Outreach

Lauren J. Ford, Hunter S. Jurecki, & Carly N. Molenkamp

Michigan State University

Project Start: 5/20/2020

Display Week: 1

TASK	ASSIGNED TO	PROGRESS	START	END
Phase 1 Planning				
Task 1	Meetings with group and advisors	100%	5/20/20	6/1/20
Task 2	Meetings with stakeholders	100%	6/1/20	6/8/20
Task 3	Literature review	100%	6/8/20	6/26/20
Task 4	Fish Bone Diagram, Project Model	100%	6/26/20	7/14/20
Task 5	GANTT chart, budget, project implementat	100%	7/14/20	7/24/20
Task 6	Full paper revisions, Project Presentation	100%	7/24/20	7/29/20
Task 7	IRB submission, Develop Questionnaire	100%	7/29/20	9/28/20
Phase 2 Implementation				
Task 1	Develop educational presentation, flyers	100%	9/28/20	10/12/20
Task 2	Meet with stakeholders, advisors	100%	10/12/20	10/24/20
Task 3	Implementation site #1, PDSA cycle discussion	100%	10/24/20	10/25/20
Task 4	Modify interventions, meet with new site stakeholders	100%	10/25/20	12/5/20
Task 5	Implementation at site #2, site #3	100%	12/5/20	1/9/21
Phase 3 Evaluation				
Task 1	Organize data, formulate data eval plan	100%	1/9/21	2/16/21
Task 2	Analyze Data, Work with Statistician	100%	2/16/21	2/26/21
Task 3	Interpret Results	100%	2/26/21	3/5/21
Task 4	Develop final presentation, presentation edits	100%	3/5/21	4/15/21
Task 5	Final Project Presentation, Final Paper edits	100%	4/15/21	4/22/21

Table E3. *GANTT chart: Timeline of Project*

Appendix F

DNP Project Financial Plan: Increasing Breast Cancer Screening in Disadvantaged Populations

Septermber 2020-April 2021

Personnel	Pay	In-Kind Donation	Total
Carly	$30/hour x 180 hours	*	$5,400.00
Hunter	$30/hour x 180 hours	*	$5,400.00
Lauren	$30/hour x 180 hours	*	$5,400.00

Other Expenses	Estimated Cost	In-Kind Donation	Total
Educational Supplies		*	$100.00

Total Expenses	Estimated
	$16,300

Figure 3. *Project Budget*

Appendix G

Breast Cancer Risk, Knowledge, and Attitudes Pre-Survey

Demographics

Check the box below that best describes you

1. What is your age group?
- ☐ 0-24
- ☐ 25-49
- ☐ 50-74
- ☐ 75+
- ☐ Prefer not to say

2. Which ethnic group best describes you?
- ☐ White
- ☐ Asian
- ☐ Black or African American
- ☐ American Indian or Alaska Native
- ☐ Native Hawaiian or other Pacific Islander
- ☐ Prefer not to say

3. What best describes your living situation?
- ☐ Own outright
- ☐ Own mortgage
- ☐ Rent
- ☐ Live with friends/family
- ☐ Live in shelter/car
- ☐ Other
- ☐ Prefer not to say

4. Do you have a primary care doctor or see a health provider regularly?
- ☐ Yes
- ☐ No
- ☐ Prefer not to say

5. Have you ever had breast cancer?
- ☐ Yes
- ☐ No
- ☐ Prefer not to say

Knowledge/Attitudes

1. *Check the appropriate boxes to answer the questions below*

Can you tell me if any of these describe your attitudes or beliefs?	Yes often	Yes sometimes	No	Don't know
I feel too embarrassed to go and see the healthcare provider				
I feel too scared to go and see the healthcare provider				
I worry about wasting the healthcare provider's time				
I find my healthcare provider difficult to talk to				
I find it difficult to make an appointment with the healthcare provider				
I am too busy to make time to go to the healthcare provider				
I have too many other things to worry about				
I find it difficult to arrange transport to the healthcare provider's office				
Worrying what the healthcare provider might find may stop me from going to the doctor				
I do not feel confident talking about my symptoms with the healthcare provider				

2. *Check the appropriate boxes to answer the questions below*

Can you tell me whether you think any of these are warning signs of breast cancer?	Yes	No	Don't Know
A lump or thickening in your breast			
A change in the position of your nipple			
Puckering or dimpling of your breast skin			

3. *Check the appropriate boxes to answer the questions below*

How much do you agree that each of these can increase the chance of having breast cancer?	Agree	Disagree	Not Sure
Having a close relative with breast cancer			
Having a past history of cancer			

Using hormone replacement therapy			
Being overweight			
Having children later on in life or not at all			
Starting your period at an earlier age			
Doing less than 30 minutes of physical activity five times a week			

Behaviors/Confidence/Intention

Check the box below that best describes you

1. How often do you check your breasts?
   ☐ Rarely or never
   ☐ At least once every 6 months
   ☐ At least once a month
   ☐ At least once a week

2. Are you confident you would notice a change in your breasts?
   ☐ Not at all confident
   ☐ Not very confident
   ☐ Fairly confident
   ☐ Very confident

3. How likely are you to get a mammogram starting at the recommended age?
   ☐ Very likely
   ☐ Somewhat likely
   ☐ Not sure
   ☐ Somewhat unlikely
   ☐ Very unlikely

Note: A portion of this survey was adapted from the Breast Cancer Awareness Measure (Breast CAM) Toolkit (version 2). 'This survey instrument (Breast CAM) was developed by Cancer Research UK, King's College London and University College London in 2009 and validated with the support of Breast Cancer Care and Breakthrough Breast Cancer.'

Appendix H

	Frequency	Percentage
Age (years)		
24-49	3	37.5
50-74	5	62.5
Ethnicity		
Asian	1	12.5
Black	7	87.5
Living		
Own mortgage	1	12.5
Rent	5	62.5
Live with friends/family	2	25
See a primary care provider		
Yes	8	100
No	0	0
History of breast cancer		
Yes	1	12.5
No	7	87.5
How often do you check your breasts?		
Rarely	2	25
At least once every 6 months	1	12.5
At least once a month	4	50
At least once a week	1	12.5

Figure 4. *Demographic Data*

	Pre-Survey	**Post-Survey**
Attitudes Mean	**38.25**	**38.875**
Knowledge Mean	**26.375**	**27.875**
Confidence Mean	**3.25**	**3.25**

	P-value
Attitudes	**0.175**
Knowledge	**0.0166****
Confidence	**0.6**

Figure 5. *Data P-values and Means*