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## Contributing Factors to Mammography Screening Among African American and Hispanic Women: Quantitative Correlation Study

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# Walden University

College of Management and Human Potential

This is to certify that the doctoral study by

Candace Russell

has been found to be complete and satisfactory in all respects,  
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Walden University

2022

Abstract

Contributing Factors to Mammography Screening Among African American and  
Hispanic Women: Quantitative Correlation Study

by

Candace Russell

MA/MS, National University, 2016

BS, Ashford University, 2014

Doctoral Study in Partial Fulfillment  
of the Requirements for the Degree of  
Doctor of Healthcare Administration

Walden University

August 2022

## Abstract

In the United States, breast cancer screening has one of the highest morbidities and mortality among minority women with cancer. The purpose of the study was to examine the statistical relationship between income, education level, age, and mammography screening among African American and Hispanic women between 2019 and 2021. The literature review suggested that there was a gap in research for contributing factors with mammography screening among African American and Hispanic women. Secondary data sets from the Behavioral Risk Factor Surveillance System between 2019 and 2021 were used to conduct a correlational design and a theoretical framework TCSB constructs. Criteria consisted of Hispanic and African American women ages 40 -74 with a total sample size of 320. The results showed the relationship between income, education level, and mammography screening between 2019 and 2021; it was statistically significant at  $p < .05$ . The study results portrayed a nonsignificant relationship between age and mammography screening. The findings confirmed that education level and income among mammography screening affects breast cancer detection in African American and Hispanic women. The positive social change implication was to increase mammography screening among African American and Hispanic women by reducing incidence rates and cost of care while improving the quality of care. The results of the study could be implemented for improvements for breast cancer screening for African Americans, and Hispanics communities.

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## Dedication

I would like to dedicate my study to my family and close friends that have always encouraged me when times were challenging to not give up. My biggest cheer leader has been my thirteen-year-old daughter who has been by my side through this journey.

## Acknowledgments

This dissertation started off a little rough in the beginning, due to not knowing what to expect. Life itself has been a challenge let alone the requirements and energy it takes to stay on top of the requirements for completion of my doctoral study. Firstly, I would like to express how thankful I am for having Dr. Gale, my chair and committee members as a coach through my dissertation process.

There were some hard times of trying to get through certain things in life, but there were always people in my circle who have always encouraged me even if that meant me having to do homework for school and having to miss out on a little fun. My daughter Za'Naya has been my biggest cheerleader; I think me being in school has affected her the most.

Finally, I am grateful for having the opportunity of attending Walden University for my Doctor of Healthcare Administration (DHA) Program.

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## Section 1: Foundation of the Study and Literature Review

### **Introduction**

Breast cancer is the second leading cause of cancer death among women (Centers for Disease Control and Prevention [CDC], 2018). Inadequate access to healthy foods, language barriers, poor mental health, lack of access to care, and health factors adversely affect African American and Hispanic women's mortality rates and breast cancer screening rates (Miller et al., 2019). Approximately 260,000 new cases of invasive breast cancer and 40,000 breast cancer deaths were projected between 2016-2019 in the United States, with non-Hispanic Black women having 42% higher death rate than non-Hispanic White women (CDC, 2020). Mammography screening has become a major health concern because there are barriers that prevent African American and Hispanic women from participating in regular preventative health services (Miller et al., 2019; Vang et al., 2019).

Mammography screening is the most effective approach for the early detection method and means of reducing mortality rates (Susan G. Komen Breast Cancer Foundation, 2019). According to the American Cancer Society (ACS; 2019), over 31,000 African American women were projected to be diagnosed with breast cancer in 2019, with over 6,000 expected to die from the disease. Research from the Susan G. Komen Cancer Research Foundation (2019) also suggested mammography screening rates among the population groups ranged from 74% of African Americans to 73% of Whites and 71% of Hispanics, indicating Hispanic women have been diagnosed with more advance stages of breast cancer than White and African American women. Increased

knowledge on mammography screenings, better access to healthcare facilities, and preventative service programs may help detect breast cancer earlier and lead to more favorable breast cancer outcomes.

Few studies are available on mammography screening among minority women and the breast cancer prevention associated with this vulnerable population (Karliner et al., 2019). The purpose of this study was to examine the statistical relationship between income, education level, age, and mammography screening among African American and Hispanic women between 2019 and 2021. The theory of care seeking behavior (TCSB) was used to explain study results. TCSB constructs are associated with individuals who are participating and those who are not participating in mammography screening, due to education level, income, internal and external factors, beliefs, and age (Lawal et al., 2017, p. 124). In 2018, the CDC (2018) and ACS (2021) reported that breast cancer prevention and early detection in breast cancer has saved numerous of lives. Racial disparities do exist in the use of mammography screening rates and are evident with 89.4% African American women and 82.5% Hispanic women. The disparity in access rates is attributed to education level, low income, poor access to healthcare, lack of trust, and poor knowledge about breast cancer screening (Ahmed et al., 2017). African American mammography incidence rates (rate of new cancer cases) are lower than rates for non-Hispanic White women (CDC, 2018). Women who have lived in low income or poverty demographic areas are 50% less likely to get a mammography screening than those who live in higher income areas (CDC, 2020). Further studies are needed to understand reasons for disparities, trends over time, and the effectiveness of interventions targeting

these disparities (Ahmed et al., 2017). I designed this study to provide information that will contribute to positive organizational, social, and governmental agency changes to improve mammography screening rates among minority populations.

The purpose of the study was to examine the statistical relationship between income, education level, age, and mammography screening among African American and Hispanic women between 2019 and 2021. The independent variables were income, education level, and age, using quantitative correlational study. The following sections of the research study include a description of the problem statement that summarize evidence of consensus that the problem is current, relevant, and significant to the discipline. Also included are the independent and dependent variables along with relative rationale including methodology and the nature of the study. TCSB constructs, which include socioeconomic status, beliefs, internal and external factors, and the rationale behind it reflecting on mammography screening among African American and Hispanic women, represents the theoretical framework of the study. Section 1 includes definitions of key terms, delimitations, assumptions, and scope of the study, and a summary of the significance of the study and conclusion.

### **Background**

Breast cancer is the most diagnosed cancer and second leading cause of cancer-related deaths among women (ACS, 2019). Although the mortality rates have declined in some ethnic populations, the incidence of cancer among African American and Hispanic population has continued to increase (Yedjou et al., 2019). Racial/ethnic minority populations in the United States, including African Americans and Hispanics,

consistently have a lower use of screening mammography when compared to non-Hispanic White populations (Ahmed et al., 2017). On average, African American and Hispanic women are diagnosed at a later stage of breast cancer than White women (Centola et al., 2021). Researchers also suggest Hispanic women may have a higher number of barriers to accessing mammography screenings than women of other ethnicities (Susan G. Komen Cancer Research Foundation, 2019).

### **Problem Statement**

The problem was that it was unknown whether a relationship exists between income, education level, and age within African American and Hispanic women and mammography screening between 2019 and 2021 (Ahmed et al., 2017). According to Ahmed et al. (2017), further studies are needed to understand the background of disparities, trends over time, and the efficacy of interventions targeting these disparities. Understanding the relationship between socioeconomic status, education level, and age could save lives and bridge the health disparity gap between ethnic minority women and the rest of the female populations (CDC, 2013b). Ahmed et al. also suggested that mammography screening in minority groups have a higher breast cancer mortality. Research from the Susan G. Komen Cancer Research Foundation (2019) suggested that mammography screening rates among the population groups ranged from 74% of African Americans to 73% of Whites and 71% of Hispanics, indicating that African American women breast cancer cases are lower than among White women, while Hispanic women have been diagnosed with more advance stages of breast cancer than White women. Variations were found in cancer screening guidelines by age, insurance, coverage, and



income between racial groups (Hirth et al., 2016). This might account for some of the differences in access. Further research is needed to understand the reasons behind these barriers that are contributing to low mammography screenings.

There is a gap in literature regarding barriers, such as education level, age, and socioeconomic status among mammography screening of African American and Hispanic women. Understanding the reasons for barriers to using of mammography screening among African American and Hispanic women may help healthcare organizations determine what improvements are needed in the healthcare systems to minimize the disparities and improve overall health (Howe et al., 2018). To minimize disparities and improve overall healthcare, providing mammography screening at a no cost or low cost and deliver services in rural, poor, and urban communities, thus providing transportation services to and from doctor visits could improve the overall barriers affecting mammography screening.

### **Purpose of the Study**

The purpose of the study was to examine the statistical relationship between income, education level, age, and mammography screening among African American and Hispanic women between 2019 and 2021. My intent was to explore mammography screenings between 2019 and 2021; the data were operationalized using education level, age, and income among African American and Hispanic ages 40- 74. Mammography screening is recommended by U.S. medical organizations for breast cancer screening in average risk women because of its demonstrated reductions in breast cancer mortality (McGuinness & Crew, 2018). The target population were African American and Hispanic

women in Kansas City, Missouri. There are significant disparities that exist in Kansas City with cancer screening practices among minorities and underrepresented populations, resulting in disproportionately higher cancer mortality rates in these populations (Gray et al., 2017). The results of this study could help catalyze social change by encouraging healthcare providers to ensure African American and Hispanic women receive adequate access to mammography screening thereby reducing the disparity. These improvements may demonstrate a positive effect on lower breast cancer incidence and mortality rates, higher use in mammography screening resources, lower mortality rates, and improved healthcare cost.

### **Research Questions and Hypotheses**

In this quantitative correlational design, I explored the relationships between the dependent variables of socioeconomic status (income), education level, and age, and the independent variable of mammography screening among two ethnic groups, African American and Hispanic women. All data have been analyzed examining a correlational design to test the null and alternative hypotheses, which results in measuring the relationships among the independent and dependent variables to determine the outcome variable by addressing the following research questions.

RQ1: To what degree, if any, is there a relationship between age and mammography screening among African American women?

$H_0$ 1: There is no relationship between age and mammography screening among African American women.

$H_{a1}$ : There is a relationship between age and mammography screening among African American women.

RQ2: To what degree, if any, is there a relationship between education level and mammography screening among African American women?

$H_{o2}$ : There is no relationship between education level and mammography screening among African American women.

$H_{a2}$ : There is a relationship between education level and mammography screening among African American women.

RQ3: To what degree, if any, is there a relationship between income and mammography screening among African American women?

$H_{o3}$ : There is no relationship between income and mammography screening among African American women.

$H_{a3}$ : There is a relationship between income and mammography screening among African American women.

RQ4: To what degree, if any, is there a relationship between income and mammography screening among Hispanic women?

$H_{o4}$ : There is no relationship between income and mammography screening among Hispanic women.

$H_{a4}$ : There is a relationship between income and mammography screening among Hispanic women.

RQ5: To what degree, if any, is there a relationship between education level and mammography screening among Hispanic women?

*H<sub>0</sub>5*: There is no relationship between education level and mammography screening among Hispanic women.

*H<sub>a</sub>5*: There is a relationship between education level and mammography screening among Hispanic women.

RQ6: To what degree, if any, is there a relationship between age and mammography screening among Hispanic women?

*H<sub>0</sub>6*: There is no relationship between age and mammography screening among Hispanic women.

*H<sub>a</sub>6*: There is a relationship between age and mammography screening among Hispanic women.

### **Theoretical Foundation of the Study**

The quantitative correlation design was aligned with the TCSB. TCSB constructs determines barriers on why people do or do not participate in health promotional programs such as mammography screening programs (Lawal et al., 2017). The constructs of the TCSB included clinical factors, socioeconomic factors such as education, affects, beliefs, norms, habits, and external resources (Lawal et al., 2017). The TCSB constructs was developed by the Triandis Theory of Behavior in 1992 that were modified to fit cancer screening factors. The rationale for using the theory was the assumption of when an individual is told that they are due for mammography screening that the individual will determine what is best for them depending on the reasons they may or may not participate in mammography screening programs. The core constructs of the theory was applied to explain the relationships between socioeconomic status (income), education

level, and age. According to Lawal et al. (2017), clinical factors and sociodemographic factors refers to influences that are indirectly factors of care seeking behavior screening. Affects and beliefs, according to Lawal, included the ability to have the belief about certain outcomes of a behavior and corresponding effects on an individual's beliefs. In other words, it could be explained that an individual may believe having routine mammography screenings would reduce their odds from dying from breast cancer or having radiation could increase the chances of developing breast cancer. External factors referred to the care that is being provided to enhance a women's participation in mammography screening (Lor et al., 2013); these could pertain to factors such as geographic access, affordability, and the acceptance within the community needs. Norms are part of the TCSB constructs classified under the theory. Norms have three divisions of norms that include social norm, personal norm, and interpersonal agreement. According to Lawal, personal norm refers to an individual traditional and custom on a person's knowledge of how they see others with the participation among mammography screening. Personal norms are an individual personal knowledge of what they may think about mammography screening, and interpersonal agreement is interactions among other individuals about breast cancer screening. The use of mammography screening in racial/ethnic minority populations is often determined by how individuals perceive the barriers of ethnicity populations in mammography screening (Wilcox et al., 2016)

The purpose of the study was to examine the statistical relationship between income, education level, age, and mammography screening among African American and Hispanic women between 2019 and 2021. The research questions align with the TCSB

constructs by asking the questions whether there is a relationship among African American and Hispanic women and mammography screening. According to Lauver (1992), intentions and habits are weighted based on individual and situational factors. The factors determined from the research questions were income, education level, and age. TCSB was used in comparison to other theories like the health belief model because the TCSB is a more comprehensive since the theory includes concept of habits, norms, and affects and has been used among difference minority and socioeconomic groups (Rollins, Sy et al., 2018) Using the TCSB framework helped determine the effects of mammography screening and the relationships between education level, socioeconomic status, and age. The results of the research may be used to increase mammography screening among minorities, reducing the incident of cancer, improving the quality of care, and reducing the cost of care.

### **Nature of the Study**

The nature of the study involved testing the hypothesis to determine if there was a relationship between the dependent variables, socioeconomic status, education level, and age, and independent variable mammography screening among African American and Hispanic women between 2019 and 2021, using a quantitative correlational to determine if a relationship exists. Further studies are needed to understand reasons for disparities, trends over time, and the effectiveness of interventions targeting these disparities (Ahmed et al., 2017). The research questions align with the TCSB constructs by asking the questions whether there was a relationship among African American and Hispanic women, and mammography screening. The use of the quantitative method in the study

allowed me to explain the set of interrelated propositions and relationships between the concepts, to determine the occurrence of events based off specified relationships of a theory examining the independent and dependent variables (Kivunja, 2018). A quantitative methodology is discovering ways how individuals think, act, and feel (Aspers, 2019). Quantitative method explains why contributing factors affects mammography screening was the best method to use as opposed to qualitative and mixed method approach (Aspers, 2019). I chose the quantitative method because the study was explained using large sample size 320 of the populations among African American and Hispanic women screening for mammography between 2019 and 2021, and percentages in discovering the relationships between the independent variable (mammography screenings) and dependent variables (income, education level, and age).

The design of the study, correlation, represents the relationships among the independent variable (mammography screening) and dependent variables income, age, and education level. When taking a correlational research approach, an experimental approach is impossible because this research will not be monitoring changes and effects of contributing factors affecting mammography screening among African American and Hispanic women. Data was collected from the BRFSS 2021 database for the use in the study for the African American and Hispanic women population in Kansas City Missouri, mammography screenings from 2019 to 2021 (CDC, 2021). The type of analysis that I used to analyze whether the variables have a relationship in variations and significance among the variables was correlational design using SPSS and a basic descriptive analysis (McCusker & Gunaydin, 2015). Correlational design was used because it determined the

relationship between the Hispanic and African American women. The criterion variable in the study were mammography screening. The predictor variables consisted of socioeconomic status (income), education level, and age. The correct research design and methodology chosen for the study was useful in determining relationships among the variable; it determined a confirmation on whether there were relationships between mammography screening among AA and Hispanic women among age, education, and income.

### **Literature Search Strategy**

The topics of mammography screening among African American and Hispanic women in Kansas City, Missouri led to the need for more research to be conducted regarding breast cancer mammography screenings among African American and Hispanic women. The literature search identified gaps that led to the research questions and hypothesis. The second section includes the main key phrases and terms used in the literature search. Terms and phrases such as breast cancer screening, mammography use, and other combinations of key words were used to enhance the literature search to focus on breast cancer screening. I gathered information between 2019 and 2021 for the literature review; some that were older than 5 years were used to support the research. The third section provides literature review of the theoretical construct, which included TCSB that explained why individuals do or do not participate in mammography screening. The theoretical framework explains how TCSB constructs reflects on choices made by minority women and breast cancer screening due to education level, socioeconomic status, and age. The fourth provides important definitions of variables



obtained in the research of literature. The important definitions of variables provide a brief subscription of what each term means relating to the research study. The variables of definitions include income, education level, age, and mammography screening.

The literature review incorporated research databases, library databases, search engines, internet, and public sites. Some of the library databases that were used to gather the research consisted of Google Scholar, Deepdyve, Science Direct, Web of Science, PubMed/Medline, and Walden University library. All sources used were related to the discipline of the research study containing mammography screening among African American and Hispanic women. Important search engines used in the study were Google, Bing, and Yahoo. Databases ranged from electronic newspapers, electronic magazine articles, biographies, and book reviews.

Numerous keywords, terms, and phrases were used to search through the databases, and included *mammography screening, breast cancer, minority populations with cancer screening, breast cancer mortality in minority ethnic women, health disparities in racial ethnic groups, mammography screening attendance, mammography use, challenges of mammography screening, education, income, age, TCSB constructs, Methodology methods, theoretical constructs, triandis theory, dependent, independent variables, quantitative study, covariate variable, conceptual framework, and barriers in mammography screening*. The search also included scholarly, published peer reviewed articles and data sources between the dates of 2017 and 2021. However, other literature older and relevant to the study were also included. Literature that was conducted more than 5 years ago were a major concern due to the possibility of literature not being up to

date based off new updated research that have been conducted on the research topic. Literature over 5 years old was used due to the lack of updated literature and data on the research topic among the use of mammography screening African American and Hispanic women. Some of the literature that presented seminal literature was from sources of PubMed, and Science Direct.

I selected articles by identifying the main ideas of the focus of the study that targeted minority population and mammography screening within the U.S. I started with most recent issues of journal articles about the topic and then worked backward; at the end of each article, I examined more sources from there reference lists. Only articles that focused on the minority populations of Hispanic and African American women among mammography screening were used in the research. The literature review search included over 100 peer reviewed articles current and non-current that were of interest, dissertations, systematic reviews, and some that were instrumental that related to the topic of mammography screening, the theoretical framework of TCSB, and correlational studies that were of interest that were included in the reference list. Below is a table representing journal articles, article titles, and databases used that represented important information pertaining to the research study of contributing factors affecting mammography screening among African American and Hispanic women. The articles listed in Table 1 explains the principals of each theory used for the headings and subheadings for each section of the literature review.

**Table 1***Databases, Search Engines, and Sources for Key Articles*

Journal title	Article title	Databases
<i>Journal of the American College Radiology</i>	<i>Lawal et al.</i> , Health Behavioral Theories and Their Application to Women's Participation in Mammography Screening	Google Scholar
<i>Image Journal of Nursing Scholar</i>	<i>Lauver.</i> , A theory of care-seeking behavior	PubMed
<i>Journal of the American College of Radiology</i>	<i>Ahmed et al.</i> , Racial Disparities in Screening Mammography in the United States	PubMed
<i>Journal of Jacobs Institute of Women's Health</i>	<i>Calo et al.</i> , Area-level Socioeconomic Inequalities in the Use of Mammography Screening	PMC
<i>A Cancer Journal for Clinicians</i>	<i>C. E. DeSantis.</i> , Cancer statistics for African Americans, 2016: progress and opportunities in reducing racial disparities	PubMed
<i>Journal of Cancer</i>	<i>Chowdhury.</i> , Assessing the Key Attributes of Low Utilization of Mammography Screening and Breast-self Exam among African American Women	Google Scholar
<i>Seminars in Oncology Nursing</i>	<i>Gray et al.</i> , Disparities in Cancer Screening Practices among Minority and Underrepresented Populations	PubMed

<i>Journal of women's health</i>	Hirth et al., Racial/Ethnic Differences Affecting Adherence to Cancer Screening Guidelines Among Women.	PubMed
<i>International journal of environmental research and public health</i>	Koc et al., What Explains Education Disparities in Screening Mammography in the United States?	PMC
<i>Journal of Cancer Education</i>	Luque et al., Systematic Review of Mammography Screening Educational Interventions for Hispanic Women in the United States	PubMed
<i>Journal of cancer treatment &amp; diagnosis</i>	McGuinness et al., The Challenges of Screening Mammography in Racial/Ethnic Minority Populations in the United States:	PubMed
<i>Journal of advance Nursing</i>	Facione NC. The Triandis model for the study of health and illness behavior: a social behavior theory with sensitivity to diversity. <i>ANS Adv Nurs Sci.</i> 1993;15(3):49-58. doi:10.1097/00012272-199303000-00007	PubMed

### **Literature of Key Variables and Concepts**

The study focused on key variables throughout the literature review search. The variables included African American and Hispanic women with contributing factors of income, education level, and age affecting mammography screening. These contributing factors to mammography screening have only been some of the factors affecting mammography screening among African American and Hispanic women. According to

Lawal et al., (2016) these are the type of factors that have been related directly to health behaviors, including seeking mammography.

According to ACS African American and Hispanic women are more likely to be diagnosed at advanced stage of breast cancer (2021). Women who reside in socioeconomically deprived communities are less likely to adhere to mammography screening (Calo et al., 2017). Also, according to Calo et al. Research shows that a woman's characteristics, such as socioeconomic status, age, and race/ethnicity are important predictors of having up-to-date mammography screening. However, social determinants, such as education and socioeconomic level are also vital as lack of awareness and poor knowledge regarding breast cancer screening, language and financial barriers continue to persist among the vulnerable population (Anushree, 2016). Studies suggest that African American women in the U.S. have increased mortality from breast cancer compared to White women with a survival rate of 81% for African Americans and 92% for White women (Chowdhury et al., 2016). The main purpose of the study were to examine the statistical relationship exist between mammography screening following dependent variables: Education level, age, and income. The hypothesis formulated from the key variables were that variations between education level, age, and income attributes did have a relationship among mammography screening within African American and Hispanic women.

The literature suggests that although breast cancer and other type of cancer often results in death, preventive care practices have improved and prolonged an individual lifespan (ACS, 2020). In the United States preventive care is on the front-line of

diagnosis diseases early for treatment. While in other societies breast cancer has been classified as a death sentence and is seen as no matter the outcome regardless of care, sought results in death that cannot be escaped from and has been taught that early detection of breast cancer will not help (Kwok, Ogusiji, and Lee, 2016). According to Morris, (2018) there have been advancements in the technology for breast cancer detection and precision.

In the U.S. breast cancer screening remains the number one tool used for early screening and detection of breast cancer (CDC, 2019). In our society today mammography for breast cancer has become a part of routine radiology instrument for preventative health measures to lower the risk of breast cancer, regardless of ethnicity or race they are (Susan G. Komen Breast Cancer foundation, 2018). Researchers for breast cancer and mammography screening in the United States suggest that ultrasound combined with x-ray mammography may improve the accuracy of breast cancer screening and early detection of breast cancer (Vang, Margolies, and Jandorf, 2018). Even though mammography screening exists, the actual ability of availability of breast cancer screening also underlines the problem presented in the study on whether a relationship exists between income, education level, and age contributes to mammography screening among African American and Hispanic women.

### **Confounding Variable**

Age: Hispanic and African American women 40 and 74 years of age. Due to breast cancer screening guidelines according to ACS women turning 40 years and older should have a mammography screening every 2 years depending on family history and

genetics (Corrarino, 2015). For the study age were categorized as: 40-44, can choose to begin mammography screening if they want to. 45-54; should get mammography screening every year, 55 and older should switch to mammography screening every 2 years or by choice, continue to have screenings every year. Any one over the age of 55 should continue breast cancer screenings if they are in good health and expected to live 10 more years or longer.

### **Overview of Breast Cancer Among Minority Women**

Although variations were found in cancer screening guidelines by age, education level, and income between racial groups (Hirth et al., 2016), the problem of the study was whether there was a relationship, between income, education level, and age within African American and Hispanic women and mammography screening between 2019 and 2021 (Ahmed et al., 2017). Breast cancer has been one of the most common diseases among minority women (Yedjou et al., 2019). Newman et al. (2017) argued that disparities in poverty and health care access barriers have a negative impact on the health and wellness of population subsets that bear a disproportionate share of these socioeconomic disadvantages, such as African Americans and Hispanic women. Poverty and health care access barriers are higher among African American and Hispanic women, and these communities are more vulnerable during economic challenges, such as recessions (Mckernan, et al., 2017). According to Ahmed et al. stated studies are needed to understand reasons for disparities, trends over time, and the effectiveness of interventions targeting these disparities in African American and Hispanic women. Breast

cancer is a malignant tumor that starts in the cells of the breast that is found mostly in Women (Yedjou et al., 2017).

According to other breast cancers studies from The Susan Komen Cancer Foundation, CDC, and State health departments, breast cancer survival rates vary differently among different racial/ethnic minority groups. Due to breast cancer being one of the leading causes of cancer deaths, it was estimated that there were 252,710 new cases and 40,610 deaths that were due to breast cancer (Howlader et al., 2017). However, the ACS breast cancer screening guideline emphasizes annual screening from 40 to 54 years of age, because it has been demonstrated that annual mammography screening in premenopausal women significantly reduces the risk of being diagnosed with an advanced breast cancer compared with biennial screening (ACS, 2021). Additionally, mammography use rates have been reported as similar for African American and Hispanic women by the ACS (based on National Health Interview Survey data), at 70 and 69%, respectively, but slightly lower for has at 64% (ACS, 2018). According to Davis et al. (2016) prevalence of not receiving a mammography based on age, socioeconomic status, and cultural for cancer prevention and control have been consistent with other national studies. Additionally, the U.S. Preventive Services Task Force (2015), decisions about mammography screening should be made on an individual basis considering patient context, including patient values regarding specific benefits and harms and preferences regarding breast cancer screening.



### **Breast Cancer Incidence, Survival Rate, and Mortality**

Among U.S. women, breast cancer is the most common cancer, the second most common cause of death from cancer, and a leading cause of premature mortality from cancer as measured by average and total years of life lost (Howlader et al.,2017). In 2012, there were approximately 13.8 million cancer survivors in the U.S. of which 21.6% were female breast cancer survivors (CDC, 2016). While the incidence of breast cancer among US women has been relatively stable during the past decade, deaths from breast cancer have declined on average 1.9% each year from 2002 through 2011 (CDC, 2016). According to Susan G. Komen Cancer Foundation (2020), the incidence rates is an overall estimate of breast cancer in the U.S. it has been estimated that in 2020 there will be 276,480 new cases of invasive breast cancer along with 48,530 new cases of ductal carcinoma with a total of 42, 170 breast cancer deaths. According to studies in the U.S. African American and Hispanic women have a lower incidence of breast cancer compared to White women (Yediou et al., 2017). Although the mortality rates have declined in some ethnic populations, the overall cancer incidence among African American and Hispanic women has continued to grow with African American at 2.5% and Whites at 1.8% (Yediou et al., 2017).

Breast cancer incidence has increased every year for Asian/Pacific islander (1.7%), African American (0.4%), and Hispanic women (0.3%) (SEER, 2017). In 2019, an estimated 268,600 new cases of invasive breast cancer were diagnosed among women in addition to 48,100 cases of breast carcinoma leading to approximately 41,760 women who was expected to die from breast cancer in 2017(ACS, 2019). Breast cancer

recurrence and development of second primary cancers are affected by genetic or hormonal factors, tumor characteristics, treatments, and certain modifiable risk factors, such as smoking, obesity, and alcohol consumption (CDC, 2017). Additionally, the US Preventive Services Task Force (2018), recommends mammography screening, which has been shown to decrease cancer-related mortality by 20% to 30% in women between the ages of 50 and 69 and may also reduce mortality in women in their 40s and older women without significant comorbidities.

### **Breast Cancer Screening and African American Women**

The primary purpose of mammography screening for breast cancer is early detection and appropriate treatment that may lead to prolongation of survival rate for breast cancer patients (Chowdhury et al., 2016). Mammography screening consists of and includes a procedure checking a woman breast before there are any signs or symptoms of breast cancer disease performed every one to 2 years, although screening cannot prevent breast cancer it could help detect breast cancer early to improve treatment outcomes (CDC, 2018). Breast cancer screening is usually followed by a mammography for detection. A Mammography is one screening tool that is, a low dose x-ray where the internal structure of the breast is examined (visualized) to detect abnormalities (CDC, 2020). Breast cancer has been one of the leading cancers diagnosed in women and ranks second as a cause of death among African American women. (CDC, 2019).

Breast cancer is a persistent and unique challenge in the African American community where it often manifests itself at a young age in this group more so than women of other racial and ethnic groups (need reference). The lack of early diagnoses

often mean that women will present to the doctor at a late stage contributing to a higher mortality rate (Passmore et al., 2017). According to researchers, African American women in the United States diagnosed with breast cancer has an estimated range of 27,060 new cases of breast cancer, with an estimate of 6,080 deaths (American Cancer Society [ACS], 2017). At least 13% of women who have a family history of a family member that has been diagnosed of breast cancer at one point of time in their life (Susan G. Komen Cancer Foundation, 2018). Breast cancer incidence rates (number of cases in disease) have been historically lower among African American women than White women (DeSantis et al., 2016). Data has suggested that incidence rates among these groups converged as of 2012 and that the mortality rates (death rates) among African Americans continue to be higher than any other race (ACS, 2019). In Fact, only 51 percent of African American women are diagnosed at the local stage, compared with 61 percent of White women (Davis et al., 2017). Incidence rates of breast cancer are higher among White women than African American women, the rate of breast cancer related deaths, are higher among African American women (Gray Tamryn et al., 2017).

The five-year survival rate with late-stage breast cancer for African American women is 15 percent, compared with 25 percent for White women (Davis et al., 2017). ACS strongly recommends annual mammography screening for women aged 45-54 and biennial mammography screening starting at age 55 (Szukis et al., 2019). Mammography remains the screening test of choice and has been shown to reduce breast cancer mortality by 22%–35% among women older than 50 years (Khaliq et al., 2015).

Research suggest, as the healthcare industry evolved many improvements and treatments in breast cancer screening evolved in treating, diagnosing, and preventing breast cancer at earlier stages these past couple of years (DeSantis et al., 2019). With all the improvements in progress, minority women are still at a disadvantage with access to mammography screening (ACS, 2019).

### **Breast Cancer Screening and Hispanic Women**

Breast cancer is the leading cause of cancer-related death among Hispanic women, and according to studies Hispanic women receive mammography screening at lower rates than some other ethnic groups (Luque et al., 2018). According to, Yanez et al., (2016) the U.S. Hispanic women experience breast cancer disparities and exhibit lower levels of adherence to screening mammography than non-Hispanic Whites (Luque et al., 2018). Little is known about the use of cancer screening services among the US Hispanic population, and few studies have examined differences in predictors of cancer screening use for specific race/ethnicity groups (Derrano et al., 2020). There are no differences in mammography rates between Hispanic and White populations, Hispanic women tend to be diagnosed with more advanced stages of breast cancer (Gray Yamryn et al., 2017). The Incidence of breast cancer among African American and Hispanic women have decreased compared to White women and mortality rates have increased at 40% higher in minority women compared to White women (CDC, 2016). One out of eight women in the U.S. will have developed some form of invasive breast cancer, and about 40,610 women will die from breast cancer (Siegel et al., 2016). Hispanic women are 30% less likely to be diagnosed than non-Hispanic White women

(CDC, 2020), Hispanic women are more likely to be diagnosed at an advance stage of breast cancer, and 20% more likely to die from the breast cancer (Florida Breast Cancer Foundation (2016). Barriers that affected Hispanic women with mammography screening were lack health insurance, cost of transportation, language translation, education, low health literacy, childcare, clinic hours, and time from work (Susan G. Komen Cancer Foundation, 2019).

### **Barriers to Breast Cancer Screening**

Barriers to mammography screening adversely affect affects racial/ethnic minority women and that have prevented minority women from participating in regular mammography screening (Miller et al.,2019). Researchers suggest, there are three barriers in question regarding mammography screening among African American and Hispanic women: (a) Age; (b) Education level; (c) and income (ACS, 2019).

### **Barriers to Insurance Accessibility Among Minority Women**

The importance of health insurance coverage and access to care, in predicting the use of cancer screening services among African American and Hispanics is a sobering finding, as minority women are substantially more likely than White women to be uninsured, to live in poverty, and to report not having a usual source of care (Williams & Cooper, 2019). According to the CDC (2019) insurance accessibility were presented into four categories variables, which included private, public, Medicare, and uninsured. Uninsured was referred to as having no private, Medicare, Medicaid, stat sponsored or government health plans. As countries address epidemiological and demographic transitions, health systems need to adapt to establish more integrated health care services

that focuses on long-term care and chronic disease (Bowser, Marquesess & Koussa et al.,2018). Although there continues to be a major concern one main factor is increasing the mortality and morbidity from breast cancer (American Cancer Society, 2020).

According to other studies, contributing factors in cancer diagnosis and screening test use by race have been reported among African American, and Hispanic women due to lack of health insurance and access to care (CDC, 2020). Insurance companies and governmental agencies determine when a medical service should be covered, and physicians tailor care to the populations they serve (Williams & Cooper, 2019). These objectives may not always align, as evidenced by health care disparities among different groups (Berland et al., 2019). The largest increased odds for a mammography are from having insurance (Bowser et al., 2018). Mammography screenings are most likely to increase by having some sort of insurance access (Bitler & Carpenter, 2016). African Americans are less likely to have private or employment-based health insurance coverage, relative to whites; are more likely to be covered by Medicaid or other publicly funded insurance; and are twice as likely to be uninsured (Copeland et al.,2018).

Understanding the impact of these seven health system barriers, in a country where access and acceptance of early screening for breast cancer is low, would allow for policies to be contemplated to improve access and use of the early screening for breast cancer (Bowser et al., 2018).

### **Barriers to Education Level Among Minority Women**

According to research studies, in the U.S. less educated women are substantially less likely to receive screening mammography (Koc et al.,2018). According to the United

States Census Bureau (2019) education level refers to the highest level of education achieved or completing. Data were used in the study that included women who have completed some schooling or none. Education interventions could play a role in increasing screening mammography rates among Hispanic women. Desantis et al. (2016) suggested that the lower education levels are among the risks factor associated with mammography screening. Damiani et al. (2016) indicated that women with lower education levels are not likely to receive mammography screenings because of the lack of knowledge and awareness. Although the use of mammography screening increased steeply in the last two decades of the twentieth century, there remain large differences in education knowledge (Koc et al., 2018). Some studies, show that interventions at clinics, with decision aids such as questionnaires and counseling, can increase patient understanding of potential harms of screening and may facilitate discussion between patients and their health care providers (Kim et al.,2018).

Breast cancer literacy (information) is positively associated with breast cancer screening. Lower educated women tend to receive mammography less often than their higher educated counterparts (Koc et al., 2018). The findings indicate that the higher the level of breast cancer literacy and the more motivated patients are, the more likely they are to be screened. White women and women with higher education and income levels may be more likely to be exposed to messages of harm outweighing benefit of mammography and to change their screening behavior as a result (Melvin et al., 2016). Women who are well informed about the importance of breast cancer and the breast cancer guidelines of the recommended screenings are more likely to be more adherent

to breast cancer screening (ACS, 2022). Functional breast cancer literacy and motivation interventions are important factors to consider when designing breast cancer screening interventions in racial/ethnic minority women (Talley et al.,2016).

### **Barriers to Socioeconomic Status Among Minority Women**

There are significant contributing factors that exist in cancer screening practices among racial and ethnic minority and underrepresented populations, resulting in disproportionately higher cancer mortality rates in these populations (Gray et al.,2017). Other studies have shown the dynamic nature of socioeconomic disparities in cancer rates as the association between income, incidence, and mortality from major cancers has changed markedly during the past 5 decades (Singh et al., 2017). Income was information that was used that provided demographic information to mammography screening such as age, race, ethnicity, income, and education level. (BRFSS, 2019). Prognoses are excellent among women with breast cancer diagnosed early and treated in a timely manner with evidence-based surgical and adjuvant care. Most women will survive for 5 to 10 years or more with a high quality of life, but racial and ethnic disparities persist (Haji et al.,2017). However, ethnic minority women of color who live in poverty or inadequately insured, tend to be more alike than higher income women of color and they also tend to be disadvantaged on cancer care compared with non-Hispanic White women (Haji et al.,2017). Higher income ( $\geq$ \$50,000 income), and those with health care coverage had significantly higher odds of screening, and African American and Hispanic participants had higher odds of receiving screening compared to Whites (Wyatt et al.,2018).



Poverty have been a major concern when determining socioeconomic barriers affecting breast cancer screening before and after the Affordable care act (ACA) (Faustine & Emmanuel, 2019). The Patient Protection and Affordable Care Act (ACA), a comprehensive health insurance package, strengthens existing and expanding health insurance coverage, eliminating coverage barriers for individuals with pre-existing health conditions, expansion of healthcare coverage to low-income adults, and mandating healthcare coverage of essential health benefits including preventive health care (Medicaid.gov, 2017).

### **Theory of Care Seeking Behavior (TCSB)**

The study was aligned using the TCSB constructs model framework. According to Lawal et al. (2017) the theory was developed to determine why individuals do or do not participate in health promotions programs such as mammography screening, due to constructs that consist of beliefs, income, affects, habits clinical and external factors (Ahmed et al., 2017). The theory was developed in 1992 based off the origin of Triandis theory but have been modified to align with breast cancer screening behavior (Lauver, 1992). The TCSB have been used for numerous health seeking behaviors in exploring women with different settings in other research studies, such as low-income, and ethnic backgrounds (Lawal et al., 2017). The table below represents a comparison among the TCSB models that have been used to explore mammography screening in women.

**Table 2***Theory of Care Seeking Behavior*

Comparison of the Health Behavioural Theories that Explore Women's Behaviour Toward Mammography Screening				
Characteristics	Health Belief Model	Theory of Planned Behaviour	Trans-Theoretical Model	Theory of Care Seeking Behaviour
Main features	<ul style="list-style-type: none"> <li>Developed by Hochbaum, Rosenstock, and Kogels in the 1950s.</li> <li>Constructs are:               <ul style="list-style-type: none"> <li>Perceived susceptibility</li> <li>Perceived severity</li> <li>Perceived barrier</li> <li>Perceived benefit</li> <li>Self-efficacy</li> <li>Cue to action</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Developed by Ajzen and Fishbein in 1980.</li> <li>Constructs are:               <ul style="list-style-type: none"> <li>Attitude</li> <li>Subjective norm</li> <li>Perceived behavioural control</li> <li>Intentions</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Developed by James Prochaska in 1977.</li> <li>Constructs are:               <ul style="list-style-type: none"> <li>Stages of change</li> <li>Processes of change</li> <li>Decisional balance</li> <li>Self-efficacy</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Developed by Lauver in 1992.</li> <li>Constructs are:               <ul style="list-style-type: none"> <li>Affect</li> <li>Belief</li> <li>Habit</li> <li>Norms</li> <li>Clinical and socioeconomic factors</li> <li>External factors</li> </ul> </li> </ul>
Advantage	It has a construct that explores the trigger to health behaviour, which is the cue to action.	The addition of perceived behavioural control as a construct that helps predicts a woman's adoption of a health behaviour.	It explores women's health behaviour through the stages of change to a healthier behaviour.	It includes broader constructs such as habit, clinical and socioeconomic factor, and external factors.
Limitations	<ul style="list-style-type: none"> <li>It does not explore the effect of socioeconomic factor on behaviour.</li> <li>It does not have a construct to explore the effect of habit on behaviour.</li> </ul>	<ul style="list-style-type: none"> <li>Intention does not always lead to a person performing health behaviour.</li> <li>It also does not explore the effect of socioeconomic factor on behaviour.</li> </ul>	<ul style="list-style-type: none"> <li>Inconsistent findings noticed among studies that evaluated the relationship between the processes and stages of change.</li> </ul>	<ul style="list-style-type: none"> <li>The low use of theory in behavioural studies, to explore women's health behaviour toward mammography screening</li> </ul>
Application in mammography screening program literature	Women with multiple sclerosis in the USA [15], Taiwanese women [16], Iranian women [17], Korean women living in USA [18]	American Indian women [19], Australian women [20], women living in the Quebec geographical region of Canada [21], Cypriot women [22]	Women in the USA [23], Muslim women living in USA (Hasnain et al, 2014b), African-American women [24], Greek women [25]	Hmong women in the USA [14], women in the USA [10, 11, 26]

TCSB constructs can be applied to many different factors that would affect the use of mammography screenings like level of education, socioeconomic status (income), and age while being able to explain, why people do or do not participate in mammography screening in African American, and Hispanic women.

**Triandis Theory**

The triandis model theory has six components, which included social behavior: social influences, affect, consequential beliefs, physiologic arousal, behavioral habits, and facilitating environmental resources (Facione, 1993). The triandis theory is the origin of the TCSB theory. Triandis theory was not used in this study. Researchers who have used the theory have been able to achieve theory-based explanations due to differences through, observations based off gender, ethnicity/race, sexual orientation, and social class

(Facione, 1993). The triandis theory is similar to the TCSB but does not have broad constructs used for research purposes and has not been used on mammography screening literature (Lauver, 1992).

### **Definition of Terms**

*Accessibility to Insurance:* -Hispanic and African Americans who did not have accessibility to insurance. Using the BRFSS 2021 survey to determine insurance accessibility women were asked “Do you have health insurance coverage such as HMO’s, PPO’s, Medicaid, employer insurance or state assistance insurance. These were coded as 0= yes, 1=No. For the study the answers were coded as 1 for yes and 2 for no.

*African American:* People having origins in any of the black racial groups of Africa (United States Census Bureau, 2020).

*Hispanic:* Classified as one of the specific Spanish, Hispanic, or Latino categories as Mexican American, Mexican, Puerto Rican, Cuban or Chicano (United States Census Bureau, 2020).

*Mammography:* - A picture of the breast used by x-ray machine to detect early signs of breast cancer in women within the past 2 years. (CDC, 2018).

*Theory of Care Seeking Behavior (TCSB):* - A theory that breaks *down* the reason why people do or do not participate in healthcare screening programs (Lawal et al., 2017).

## **Assumptions, Scope and Delimitations, and Limitations**

### **Assumptions**

Assumptions that were made in the study were that Hispanic and African American women represent the minority populations with the lowest mammography screening use due to barriers such as income, level of education, and age. The assumptions arise because there were numerous barriers across the United States that limit the ability for individuals to seek mammography screening, which made it possible to assume these assumptions with minority populations. An assumption that was made in the study was due to mammography screening rates in minority populations, which represented potential inequality in access to healthcare. According to Lawal et al (2017), TCSB constructs were used to determine why people participate or not participate in preventative healthcare programs examining the constructs of income, age, and education level. Several studies that utilized TCSB constructs model revealed that the theory was instrumental in determining behaviors associated with preventative care measures. The assumptions were necessary for the study to determine the importance of the contributing factors affecting mammography screening among African American and Hispanic women. The variables of the study were chosen because they were important contributing factors associated with Hispanic and African American women who had mammography screening rates between 2019 and 2021 (Lawal et al., 2017). TCSB constructs align with African American and Hispanic women decisions to participate or not to participate in mammography screening with education level, income, and age factors.

### **Scope and Delimitations**

The focus of the study is the relationships between TCSB constructs in detecting mammography screening (independent variable) among African American and Hispanic women between 2019-2021, ages 40-74. Dependent variables included in the study were age, education level, and income that are all related to the screening rates of mammography screening between 2019 and 2021. The variables in assessing TCSB constructs (education level, age, and income) in detecting mammography screening among African American and Hispanic women were all instrumental. Anything considered instrumental in a research study is the most important influence of causing something or anything to happen (Creswell, 2014).

It was important to study the variables of education level, age, and income with the relationship of mammography screening because of the gap in literature in African Americans and Hispanic women 40 years and older with mammography screening use (Ahmed et al., 2017). The study may be generalized towards populations of Hispanic and African American women within Kansas City, Missouri that have mammography screening rates with high breast cancer mortality that are influenced by barriers of education level, age, and income. Studies have shown that mammography screening has been a concern in detecting breast cancer in African American, and Hispanic women due to the high mortality rates even with the decrease in breast cancer. Due to the concern of breast cancer screening, it was an important focus on the research problem that was identified.

Even though Hispanic and African American women were the focus of the study, due to these two ethnicity groups having the lowest rates in mammography screening other races, such as non-Hispanic populations had to be examined to make comparisons on who have the lowest mammography screenings with affecting barriers of education level, age, and income. Incorporating the TCSB constructs toward mammography screening was important in explaining the study results when determining if income, education level, and age were contributing factors on rather to participate or not in mammography screening among African American Hispanic women. TCSB constructs model is the only model being used because this model was geared towards mammography screening in women that related to the study of factors contributing to mammography screening in women.

### **Limitations**

Limitations could apply with the use of secondary data that adds limitations on being able to justify or validate any collection of data that were collected on participants (Ruggiano & Perry, 2019). For researchers, lack of knowledge about the cultural differences among ethnic minorities could result in ineffective communication strategies about health research at all stages, including recruitment, enrollment, and retention (Hasson et al., 2022). Another limitation when using secondary data could have been collected for other purposes that could prevent access to information that is more specific to the study (Johnston, 2014).

### **Significance of the Study**

This quantitative correlational design contributed to understanding the relationships between socioeconomic status, education level, and age to mammography screening among African American and Hispanic women in Kansas City, Missouri by answering the research questions. The findings of the quantitative correlational design may support the professional practice of mammography screening by increasing the incident of screening among minorities, specifically African American and Hispanic women. The findings of this quantitative correlational study may lead to social change by examining other variations among contributing factors to mammography screening among minorities. These findings may be used by the health care professional to increase mammography screening among minorities, reducing the incident rates of cancer, improving the quality of care, and reducing the cost of care. The goal of Healthy People (2021) goal was to increase awareness and understanding of the determinants of health disease (CDC, 2019). Cancer health disparities, such as demographics, age, gender, social class, social pressure, ethnicity, and treatment are not equally effective for and accessible to all Americans (Patel et al., 2020).

### **Summary and Conclusion**

Disparities in the breast cancer screening is a major concern in the U.S. (Yedjou, 2019). Although cancer incidence rates have declined, it remains a healthcare concern for African American and Hispanic women, due to the level of education, age, and socioeconomic status (CDC, 2019). Non-Hispanic black have a 42% higher death rate in breast cancer than non-Hispanic white (CDC, 2020). The continuous rise in breast cancer

and lower rates of mammography screening the mortality rates for women of other cultured have contributed to early-stage detection and diagnoses followed up with effective and timely treatments (The Susan Komen, 2019). Monitoring and reducing health disparities according to socioeconomic status and race/ethnicity have long been an important health policy goal in the United States (Singh et al., 2017).

Breast cancer screening rates remain lower in African American and Hispanic women than non-Hispanic White due to the disparities (Ahmed et al., 2017). Education level, age, socioeconomic status may reflect mammography screening rates, it may be determined if there is a correlational among these two minority groups. These are just a few of the disparities factors that are reasons why mammography screening rates are low rather than improving (CDC, 2019). Having an understanding in the disparities that are influencing breast cancer screening in African American and Hispanic women is important in establishing new improvements and outcomes in promoting new programs that will help improve breast cancer screening rates (Susan G. Komen Cancer Foundation, 2020). Improving better programs and interventions could create positive social outcome by improving positive care seeking behavior toward health prevention programs for minority populations. With breast cancer being the second deadliest disease for African American and Hispanic women, these two minority groups are often diagnosed in the late stages when the breast cancer has already reached advanced stages, which reduces survival rates and increases mortality rates (Eric et al.,2018). Regular mammography screening is the most effective method for early detection of breast cancer means of reducing mortality rates (Coleman, 2017).



## Section 2: Research Design and Data Collection

### **Introduction**

The purpose of this quantitative, correlational design study was to examine the statistical relationship between income, education level, age, and mammography screening among African American and Hispanic women between 2019 and 2021. Secondary data from the Kansas City, Missouri health department 2021, BRFSS 2021, and SEERS were used to identify the relationships between the variables. Data were gathered from surveys that represented statistical information on mammography screening among African Americans and Hispanics women between 2019 -2021. Section 2 includes the research ranging from the research design and rationale, statistical analysis, methodology that is required, secondary data, and threats to validity that was used in the research study.

### **Research Design and Rational**

A quantitative correlational was used to determine the relationship between the variables. Using quantitative research allows researchers to investigate a hypothesis and how factors of variables influence each other (McCluster et al., 2015). The results of the research can improve the quality, knowledge, and health care policies in the health care sector through testing unknown hypotheses (Lau, 2017). Researchers have used a correlational design to identify relationships between data (Lau, 2017). I used the correlational design to identify the relationship between African American and Hispanic women and mammography screening based on income, education level, and age. Correlational design involves predicting value of the independent variable from the value

of the dependent variable (Pandis, 2016). The correlational design was also appropriate due to observation and measures used to determine the pattern between the variables. An independent  $t$  tests and Levene's test was appropriate for the datasets to test homogeneity variance, whenever a  $t$  tests is performed a Levene's test is done. A sample  $t$  tests and Levene's test are used to determine the relationship between the independent variable (predictors) and the dependent variable (criterion; Beaber et al., 2019), helping determine the significance among the variables (Setia, 2016). A greater understanding of the needs of African American and Hispanic women is important for developing preventative health programs and increasing the awareness of the importance of mammography screening (Agide et al., 2018).

### **Methodology**

The purpose of the study was to determine whether a relationship exist between the dependent variables' income, education level, and age and the independent variable mammography screening among African American and Hispanic women between 2019 and 2021. The target population was African American and Hispanic women from Kansas City, Missouri ages 40 -74 who participated in the 2021 BRFSS. The BRFSS 2021 is a telephone survey used by health care systems that are completed by each state health department and then transmitted to the CDC (2021). The survey includes questions pertaining to education level, accessibility to insurance, socioeconomic status, and mammography screening between 2019 and 2021. The two questions related to breast cancer screening are: "Have you ever had a mammography?" and "How long ago has it been since your last mammography?" Thus, secondary data sets were used to answer the

research questions. This secondary data set was provided through a link that directly went to the CDC website where the BRFSS 2021 survey questionnaires were provided. No special permission including the Institutional Review Board (IRB) was required to obtain access to the BRFSS 2021 data because 2021 BRFSS survey data is available for public use.

### **Population**

The population targeted in the research study were African American and Hispanic women in Kansas City, Missouri was the first criteria for the study and had to be between 40 and 74 years old was the second criteria. The total number of female participants who responded to the BRFSS 2021 survey for study by Kansas City, Missouri health department was 320. Participants had never been diagnosed with cancer and had never had any mastectomies. The BRFSS 2021 is a reliable source of information that provides real accurate data statistics (CDC, 2021).

### **Sampling Strategy**

The sampling strategy used for the study was purposeful sampling. Purposeful sampling is a technique where a researcher decides what needs to be known and sets out to find people who can and are willing to provide the information, which helps the data represent the study population (Frankfort et al., 2015; Ilkeretkan & Sulaiman, 2016). The BRFSS divides telephone numbers into two stratas, which include African American and Hispanic women, into three groups based off income, education level and age, which are sampled separately. The high-density and medium-density strata contain telephone numbers that are expected to belong mostly to households. In the process of landline

surveys, only one adult per household was selected. The cellular phone surveys included each adult respondent that was considered a one-person household.

The rationale for the study was to make sure only women between the age 40 and 74 years old who reported never being diagnosed with cancer and never have had mastectomies were included. Women over the age of 74 were excluded because they are no longer required to keep up with mammography screening as a preventative service. Younger women 40 and under were excluded because of possible over diagnoses of breast cancer. The inclusion categories of the study were African American and Hispanic women between the ages 40 and 74 and who reported never being diagnosed with cancer have had mastectomies.

### **Sampling Frame**

The sampling frame of the data set involved women surveyed who were ages 18 and older (BRFSS, 2021). The study included women who were African American and Hispanic women between the ages of 40 and 74 in Kansas City, Missouri. Women 75 and older were excluded due to preventative services guidelines stating mammography screening was not required and only optional once a woman reached a certain age (ACH, 2016). Women 40 and under were also excluded because of the fact of possible over diagnoses of breast cancer, and women who also have had any mastectomies were excluded (ACH, 2016).

### **Recruitment, Participation, and Data Collection**

Secondary data sets were used in this research study from the BRFSS that could be found through the CDC website (2021). All data that were obtained from the Kansas

City, Missouri health department were used to ensure all participants were 40–74 years of age, guaranteed all participants were represented, and ensured biased information was eliminated during the survey process. Participants who were surveyed in the study had to have a landline number in their household or cell phone to be interviewed. Anyone diagnosed with cancer or who had mastectomies were eliminated from the study. The two categories of participants that was collected were African American and Hispanic women.

### **Instrumentations and Operationalization of Constructs**

The CDC developed questions on the BRFSS 2021 survey that related to the study are “Have you had a mammography within the past 2 years?” with the responses of yes or no, Level of education? With choices of elementary, some high school, some college or technical, and college graduate. Additional questions on the BRFSS 2021 survey relevant to the study also included Income levels? with the choices of less than \$10,000, \$10,000–\$15,000, \$20,000–\$25,000, \$35,000–\$50,000, \$50,000–\$75,000, and \$75,000 or more and age of each participant? with choices ranging from 40–44, 45–49, 50–54, 55–59, 60–64, 65–69, 70–74, 75–79, and 80 or older. Each of the survey questions was asked for African American and Hispanic women, excluding all non-Missouri, non-female, women over the age of 75, and individuals under the age of 40.

### **Validity of Instrumentation**

The BRFSS is a large surveillance system that focuses on phone surveys on different types of health research (CDC, 2020). Since the data sets are secondary for this study as opposed to primary, it has not been unusual for instruments to undergo scrutiny

to establish reliability and validity (BRFSS, 2021). The research questions and tools used for this study have been tested and utilized by numerous researchers from around the world (CDC, 2017, 2020).

## **Operational Definitions**

### **Independent Variable**

*Mammography screening*: Checking a woman's breast for any symptoms or signs of breast cancer disease within the past 2 years (CDC, 2019). It is the most popular screening exam for breast cancer awareness (ACS, 2017). Recommendations for breast cancer screening has been part of a preventative health care for women 40–74 years of age every year 2 years (CDC, 2021). The BRFSS 2021 questions asked, “How long has it been since last mammography screening?” The codes used for the answers are 1 = within the past 2 years, 2 = within the past 3 years, 3 = within the past 5 years, and 4 = 5 or more years. Answers for the study were coded as within 2 years = 1 and more than 2 years = 2. All data collected was within the past 2 years, any answers not within the 2 years was excluded from the study.

### **Dependent Variables**

*Age*: Hispanic and African American women 40–74 years of age. According to ACS, women turning 40–74 years of age should have a mammography screening every 2 years depending on family history and genetics (Corrarino, 2015). Age was categorized as 40–44 years of age, can choose to begin mammography screening if they want to; 45–54 years of age, should get mammography screening every year; and 55 and older should switch to mammography every 2 years or by choice can continue to have screenings

every year. Any one over the age of 55 should continue breast cancer screenings if they are in good health and expected to live 10 more years or longer.

*Education level:* Highest level of education completed reported as high school completion or higher, an associate's or higher degree, a bachelor's or higher degree, or a master's or higher degree.

*Socioeconomic status (SES):* Demographic information related to income (BRFSS, 2019).

### **Data Analysis Plan**

Data that were gathered for this quantitative research were analyzed using SPSS, which is widely used tool used to conduct statistical analysis (Taylor Quan & Joseph, 2015). SPSS analytics has been used in quantitative research to determine relationships among variables and validate research examining correlational design. The secondary data sets were filtered for race, age, breast cancer screening for women 40 years through 74 years of age, and level of education. Some data that were excluded in this study included women over the age of 74. Women who have had prior cancer diagnoses were also excluded in the study along with anyone who have had any mastectomies. The purpose of analyzing the statistical variables for the research was to test the hypotheses associated with the research questions:

RQ1: To what degree, if any, is there a relationship between age and mammography screening among African American women?

$H_01$ : There is no relationship between age and mammography screening among African American women.

$H_{a1}$ : There is a relationship between age and mammography screening among African American women.

RQ2: To what degree, if any, is there a relationship between education level and mammography screening among African American women?

$H_{o2}$ : There is no relationship between education level and mammography screening among African American women.

$H_{a2}$ : There is a relationship between education level and mammography screening among African American women.

RQ3: To what degree, if any, is there a relationship between socioeconomic status and mammography screening among African American women?

$H_{o3}$ : There is no relationship between income and mammography screening among African American women.

$H_{a3}$ : There is a relationship between income and mammography screening among African American women.

RQ4: To what degree, if any, is there a relationship between income and mammography screening among Hispanic women?

$H_{o4}$ : There is no relationship between income and mammography screening among Hispanic women.

$H_{a4}$ : There is a relationship between income and mammography screening among Hispanic women.

RQ5: To what degree, if any, is there a relationship between education level and mammography screening among Hispanic women?



$H_{o5}$ : There is no relationship between education level and mammography screening among Hispanic women.

$H_{a5}$ : There is a relationship between education level and mammography screening among Hispanic women.

RQ6: To what degree, if any, is there a relationship between age and mammography screening among Hispanic women?

$H_{o6}$ : There is no relationship between age and mammography screening among Hispanic women.

$H_{a6}$ : There is a relationship between age and mammography screening.

Correlational design and descriptive statistics were used to determine relations among the variables. A  $t$  tests and Levene's test were the best statically analysis to use due to providing an interpretation of the variables that is understandable. The results of the data analysis represent the significance, percentages, and confidence intervals that determined the association among the variables. The association presented as statistical significance at  $p > .05$  represented a significant relationship between the variable's confidence intervals at 95%, and a  $p$  value at  $> .05$  represented a positive relationship between the variables.

### **Data Cleaning**

Data cleaning involved detecting, utilizing, editing, and interpreting data. Data from the CDC that was used was converted into a xpt file to csv file and uploaded. The file contained the breast cancer screening study. The data involving the variables was entered into the SPSS 24 version using correlational.

### **Threats of Validity**

Threats to validity are intrinsic and extrinsic factors. All data collected from the BRFSS 2021 were self-reported, and non-responses bias reporting, which could affect results of external validity. In many studies using secondary datasets issues could occur (International Agency for Research on Cancer, 2016). Some data sets can introduce limitations in the study that includes questionnaires using those ages of 18 and above along with being non-internationalized individuals. In some cases, subjects sometimes can have problems creating biases that results in limitations to a study's validity.

#### **External Validity**

External validity was seen as a design that can include assumptions made by limitations of the study. Factors that were affected by the generalizability was a possible threat to the validity of the study. In this study only women from Kansas City, Missouri was included, limiting the generalizability.

#### **Internal Validity**

The possibility of using the incorrect datasets could result in a threat to internal validity. When there is a threat in validity in a study it may be difficult to determine whether there is a relationship among the variables representing the study. Using a secondary data set meant that no participants withdrew from the study, resulting in no issues affecting internal validity. Additionally, correlational design showed validity and reliability of the relationships of the variables.

#### **Credibility and Reliability**

Credibility and reliability were important in establishing validity in all research

studies (Liang, 2021). Credibility involves the importance of trustworthiness of health information gathered from digital sources (Laura & Jennifer, 2017). The data used for this research came from the BRFSS 2021 survey. The BRFSS 2021 survey provided codebook names for all the variables which included responses to survey questions, the variables of the study, and the values for each variable that represented the study.

### **Ethical Procedures**

Obtaining research using secondary data could always produce ethical concerns. Following Walden University protocols on limiting ethical concerns allowed the data that were collected using appropriate ethical procedures. Data that were collected did not contain any personal information identifying individuals who participated in the study. Surveys collected from the BRFSS 2021 was information that was gathered within Kansas City, Missouri, were random non-institutionalized surveys based off the population of African American and Hispanic women, from 40–74 years of age and education level. All data were assessed for accuracy, timeframe, content, and purpose. As a requirement of the Walden IRB, this research was approached on mammographic screening utilizing secondary data. There was no conflict of interest in collecting secondary data for Kansas City, Missouri for the study. All ethical issues were addressed to ensure the patient protection and confidentiality of study participants.

### **Summary and Conclusion**

This section of the study introduced the analysis and data collection for the dissertation. The focus of the study was on the rationale of the design and introduction to the population group. Other sections of the study introduced the methodology. The

analysis used for the study was correlational design to determine the relationship among the variables examining Levene's and  $t$  tests to address the research questions. Overall, Section 2 provides a foundation for the presentation of results in Section three.

### Section 3: Presentation of Results and Findings

#### **Introduction**

The purpose of the study was to examine the statistical relationship between income, education level, age, and mammography screening among African American and Hispanic women between 2019 and 2021. The research method used in the study was quantitative method using a  $t$  tests and Levene's test to support or reject null and alternative hypotheses, which resulted in measuring the relationships among the relationships among the independent and dependent variables to determine the outcome variable that answered the following research questions.

RQ1: To what degree, if any, is there a relationship between age and mammography screening among African American women?

$H_01$ : There is no relationship between age and mammography screening among African American women.

$H_a1$ : There is a relationship between age and mammography screening among African American women.

RQ2: To what degree, if any, is there a relationship between education level and mammography screening among African American women?

$H_02$ : There is no relationship between education level and mammography screening among African American women.

$H_a2$ : There is a relationship between education level and mammography screening among African American women.

RQ3: To what degree, if any, is there a relationship between income and mammography screening among African American women?

*H<sub>0</sub>3*: There is no relationship between income and mammography screening among African American women.

*H<sub>a</sub>3*: There is a relationship between income and mammography screening among African American women.

RQ4: To what degree, if any, is there a relationship between income and mammography screening among Hispanic women?

*H<sub>0</sub>4*: There is no relationship between income and mammography screening among Hispanic women.

*H<sub>a</sub>4*: There is a relationship between income and mammography screening among Hispanic women.

RQ5: To what degree, if any, is there a relationship between education level and mammography screening among Hispanic women?

*H<sub>0</sub>5*: There is no relationship between education level and mammography screening among Hispanic women.

*H<sub>a</sub>5*: There is a relationship between education level and mammography screening among Hispanic women.

RQ6: To what degree, if any, is there a relationship between age and mammography screening among Hispanic women?

*H<sub>0</sub>6*: There is no relationship between age and mammography screening among Hispanic women.

$H_{a6}$ : There is a relationship between age and mammography screening among Hispanic women.

A correlational design was used to answer the research questions measuring the frequency of mammography screening among African American and Hispanic women between 2019 and 2021. I conducted independent  $t$  tests and Levene's test to examine the relationship of African American and Hispanic women who had a mammography screening between 2019 and 2021 by education, age, and income. A correlational design was used to examine the Levene's test, which determines the variance and independent  $t$  tests that determine the significance of the statistical data. Levene's test was necessary to highlight the variance between each variable among African American and Hispanic women. The  $t$  tests were conducted to determine the significance between the two groups among each variable. Section 3 of the study addresses the secondary data collection, demographic statistics of the populations, analyses results, and findings of the study.

### **Data Collection of Secondary Data**

Table 3 represents the data collected for this study was from the Kansas City, Missouri health department telephone survey. The study was in collaboration with the BRFSS 2021, CDC 2021 within all 50 states of the United States that collect annual through telephone surveys. The BRFSS is a data base system that obtains information on preventative health and risk factors behaviors ranging from preventative and chronic health measures among the different types of health populations.

The interviews that were conducted with individuals 18 years of age and older through cellular and landlines within Kansas City, Missouri (CDC, 2019). All telephone

interviews that were conducted followed the BRFSS 2021 study guidelines. Participants were randomly selected from different households among the African American and Hispanic women by the Kansas City, Missouri health department (CDC, 2019). Each participant who was selected received phone calls answering four survey questions that took 15–18 minutes of their time during day and evening hours. The variables in the data sets for African American and Hispanic women were gender, ethnicity, education, and socioeconomic status (income; CDC, 2019). All data were collected through the department of health and transmitted to the CDC. The data collection section provides demographic characteristics of the sample population in Kansas City, Missouri. Table 3 provides the variables of the study: age, education, income, and mammography screening. The table displays the symbol “n” equals the data size. The term “Missing” is the label for participants who did not complete or return the BRFSS 2021 Survey.

The variables that pertained to the study were age, education, income, and mammography screening. The 2021 BRFSS survey data were computed as follows. The variable age was broken down into nine categories: 40 - 44, 45 - 49, 50 - 54, 55 - 59, 60 - 64, 65 - 69, 70 - 74, 75 - 79, and 80 or older. The data for education level were broken down into six categories: never attended school or only kindergarten; elementary; some high school; high school graduate; some college or technical school; and college graduate (undergraduate, masters, and doctorate degrees). In the 2021 BRFSS survey, African American and Hispanic women were asked highest level of completed education (CDC, 2018).



The question that was asked in the BRFSS 2021 survey for mammography screening was: “Have you had a mammogram screening within the past 2 years?” The answers were yes or no (CDC, 2019). The Hispanic and African American women who answered yes to having a mammography screening between 2019 and 2021 were coded as yes = 1 (CDC, 2020). Those who did not have a mammogram between 2019 and 2021 were coded as no = 2.

The data for income were broken down into eight categories: less than \$10,000, \$10,000 - \$15,000, \$15,000-\$20,000, \$20,000 - \$25,000, \$ 25,000 - \$35,000, \$35,000 - \$50,000, \$50,000 - \$75,000, and \$75,000 or more. The sample of 320 participants in the 2021 BRFSS survey consisted of 280 (87.5%) African Americans and a total of 40 (12.5%) Hispanics between ages 40 years of age and older. Of the 320 participants, a total of 268 (83.75%) participants had had at least a high school education or higher. A total of 120 (38.75%) participants made \$25,000 or less per year, and 212 (74.4%) participants had a mammography screening during 2019 and 2021. African American and Hispanic women 40 years of age and older were asked if they had had a mammography screening within the past 2 years. The total Hispanic women who answered yes or no to the question were 40, and African American women who answered yes or no to having a mammography screening were 280. Table 3 represents the characteristics of the study sample population.

**Table 3***Characteristics of the Study Sample Population*

Variable	Category	Black	Hispanic	Total N	Percentage
Race	Black, Non-Hispanic	-	-	280	87.5
	Hispanic	-	-	40	12.5
	Missing	-	-	0	0
	Total	-	-	320	100.0
Education	Elementary	8	5	13	4.1
	Some high school	35	3	38	11.9
	High school graduate	88	10	98	30.6
	Some college or technical	76	14	90	28.1
	College graduate	72	8	80	25.0
	Missing	1	0	1	0.3
	Total	280	40	320	100.0
Income	Less than \$10,000	28	2	30	100.0
	\$10,000-\$15,000	16	2	18	5.6
	\$15,000-\$20,000	29	6	35	10.9
	\$20,000-\$25,000	32	5	37	11.6
	\$25,000-\$35,000	32	2	34	10.6
	\$35,000-\$50,000	24	8	32	10
	\$50,000-\$75,000	22	3	25	7.8
	\$75,000 or more	27	6	33	10.3
	Missing	70	6	76	23.8
Total	280	40	320	100.0	
Age	40-44	19	3	22	6.9
	45-49	15	5	20	6.3
	50-54	23	6	29	9.1
	55-59	44	4	48	15
	60-64	40	3	43	13.4
	65-69	49	2	51	15.9
	70-74	31	7	38	11.9
	75-79	27	2	29	9.1
	80 or older	32	8	40	12.5
	Missing	0	0	0	0
	Total	280	40	320	100.0
Mammography	Yes	212	26	238	74.4
	No	52	12	64	20.0
	Missing	16	2	18	5.6
	Total	280	40	320	100.0

*Note.* After excluding all non-Missouri, non-female, and individuals under the age of 40, there was a total sample size, 320. N=Total population

## Results Cross Tabs

### **Mammography Screening Frequency Among African American and Hispanic Women**

Tables 4 and 5 represent the frequency of mammography screening among African American and Hispanic women in Kansas City, Missouri who answered yes or no to having a mammography screening. The tables provide the variable, mammography screening, following the question from the BRFSS 2021 survey question of “Have you ever had a mammography screening?” Participants answered yes or no. The table displays frequency, indicating the number of women who answered yes or no to having a mammography screening between 2019 and 2021. The term, valid percentage is the percentage of participants who answered with yes or no regarding having a mammography screening. Two Hispanic women and 16 African American women, a total of 18, did not respond to the 2021 BRFSS survey and were excluded from the study. A total of 59 African American and 10 Hispanic women ( $n = 69$ , 21.5%) had mastectomies and had not received a mammography screening and were excluded from the study. Table 4 represents the frequency of having a mammography screening among Hispanic women between 2019 and 2021. A total of 38 (68.4%) Hispanic women reported they had a mammography screening between 2019 and 2021, and 12 (31.6%) Hispanic women did not receive a mammography screening between 2019 and 2021.

Table 5 represents the frequency of having a mammography screening among African American women between 2019 and 2021. A total of 212 (80.3%) African American women reported that had a mammography screening between 2019 and 2021.

A total of 52 (19.7%) African American women that did not receive a mammography screening between 2019 and 2021.

**Table 4**

*Mammography Screening Frequency Hispanic Women*

		Frequency	Valid Percent
Valid	Yes	26	68.4
	No	12	31.6
	Total	38	100.0
Total		40	100.0

**Table 5**

*Mammography Screening Frequency African American Women*

		Frequency	Valid Percent
Valid	Yes	212	80.3
	No	52	19.7
	Total	264	100.0
Total		280	100.0

**Age and Mammography Screening African American**

Research question: To what degree, if any, is there a relationship between age and mammography screening among African American women? Table 6 represents numbers and percentages by age for African American women who answered yes or no to having mammography screening. A total of 19 (6.8%) respondents between 40 and 44 years old, 15 (5.4%) respondents between 45 and 49 years old, 23 (8.2%) respondents between 50 and 54 years old, 44 (15.7%) respondents between 55 and 59 years old, 40 (14.3%)

respondents between 60 and 64 years old, 49 (17.5%) respondents between 65 and 69 years old, 31 (11.0%) respondents between 70 and 74 years old, 27 (9.6%) respondents between 75 and 79 years old, and 32 (11.4%) respondents 80 or older. According to the ACS (2021) guidelines, African American women under 40 and over 74 were excluded from the BRFSS 2019 and 2021 survey.

**Table 6**

*Age and Mammography Screening African American Women*

	Frequency	Percent
Valid 40-44	19	6.8
45-49	15	5.4
50-54	23	8.2
55-59	44	15.7
60-64	40	14.3
65-69	49	17.5
70-74	31	11.1
75-79	27	9.6
80 or older	32	11.4
Total	280	100.0

**Education and Mammography Screening African American**

Research question: To what degree, if any, is there a relationship between education and mammography screening among African American women? Table 7 represents numbers and percentages by education level for the African American women who answered yes or no to having a mammography screening. Of a total of 280 African American, at least eight (2.9%) respondents had had elementary schooling, 35 (12.5%)

respondents had some high school education, 88 (31.4%) respondents were high school graduates, 76 (27.1%) respondents had some college or technical schooling, 72 (25.7%) respondents were college graduates, and one (4%) respondent did not provide any education level.

**Table 7**

*Education and Mammography Screening African American Women*

		Frequency	Percent
Valid	Elementary	8	2.9
	Some high school	35	12.5
	High school graduate	88	31.4
	Some college or technical school	76	27.1
	College graduate	72	25.7
	Total	279	99.6
Missing		1	.4
Total		280	100.0

**Income and Mammography Screening African American**

Research question: To what degree, if any, is there a relationship between income and mammography screening among African American women? Table 8 represents numbers and percentages by income for the African American women who answered yes or no to having a mammography screening. Income between \$10,000 - \$75,000 or more. Lowest income level was less than \$10,000 with a total of 28 (10%) respondents, \$10,000 - \$15,000 16 (5.7%) respondents, \$15,000 - \$20,000 29 (10.4%) respondents, \$20,000 - \$25,000 32 (11.4%) respondents, \$25,000 - \$35,000 32 (11.4%) respondents, \$35,000 - \$50,000 22 (8.6%) respondents, \$50,000 - \$75,000 22 (7.9%) respondents, and \$75,000

27 (9.6%) respondents. African American women below 40 and over the age of 75 were not recorded in this study due to ACS guidelines.

**Table 8**

*Income and Mammography Screening African American Women*

		Frequency	Percent
Valid	Less than \$10,000	28	10.0
	\$10,000-\$15,000	16	5.7
	\$15,000-\$20,000	29	10.4
	\$20,000-\$25,000	32	11.4
	\$25,000-\$35,000	32	11.4
	\$35,000-\$50,000	24	8.6
	\$50,000-\$75,000	22	7.9
	\$75,000 or more	27	9.6
	Total	210	75.0
Missing		35	12.5
		34	12.1
		1	.4
Total	70	25.0	
Total	280	100.0	

**Age and Mammography Screening Hispanic Women**

Research question: To what degree, if any, is there a relationship between age and mammography screening among Hispanic women? Table 9 represents numbers and percentages by age for the Hispanic women who answered yes or no to having a mammography screening. A total of 40 respondents, three (7.5%) between 40 and 44 years old, five (12.5%) between 45 and 49 years old, six (15.0 %) between 50 and 54 years old, also, four (10.0%) between 55 and 59 years old, three (7.5%) between 60 and 64 years old, two (5.0%) between 65 and 69 years old, seven (17.5%) between 70 and 74 years old, two (5.0%) between 75 and 79 years old, and eight (20.0%) between 80 years

and older. According to the ACS guidelines African American women under 40, and over the age of 74 were excluded from the study.

**Table 9**

*Age and Mammography Screening Hispanic Women*

	Frequency	Percent
Valid 40-44	3	7.5
45-49	5	12.5
50-54	6	15.0
55-59	4	10.0
60-64	3	7.5
65-69	2	5.0
70-74	7	17.5
75-79	2	5.0
80 or older	8	20.0
Total	40	100.0

**Education and Mammography Screening Hispanic Women**

Research question: To what degree, if any, is there a relationship between education and mammography screening among Hispanic? Table 10 represents numbers and percentages by education for the Hispanic women who answered yes or no to having a mammography screening. A total of five (12.5%) respondents had elementary school level, three (7.5%) respondents had high some high school, 10 (25.0%) respondents was high school graduates, 14 (35.0%) respondents had some college or technical school, and eight (20.0%) respondents were college graduates, undergraduate, masters, and doctorate degrees.



**Table 10***Education and Mammography Screening Hispanic Women*

		Frequency	Percent
Valid	Elementary	5	12.5
	Some high school	3	7.5
	High school graduate	10	25.0
	Some college or technical school	14	35.0
	College graduate	8	20.0
	Total	40	100.0
<hr/>			
Total		40	100.0

**Income and Mammography Screening Hispanic Women**

Research question: To what degree, if any, is there a relationship between income and mammography screening among Hispanic women? Table 11 represents a cross tab of numbers and percentages by income for Hispanic women who answered yes or no to having a mammography screening. A total of 34 Hispanic women between 50 and 74 years of age. Starting at the lowest income level, \$10,000 with two (5.0%) respondents, \$10,000 - \$15,000 with two (5.0%) respondents, \$15,000 - \$20,000 with six (15.0%) respondents, \$20,000 - \$25,000 with five (12.5%) respondents, \$25,000 - \$35,000 with two (5.0%) respondents, \$35,000 - \$50,000 with 8 8 (20.0%) respondents, \$50,000 - \$75,000 with three (7.5%) respondents, and \$75,000 or more at six (15.0%) respondents. Hispanic women below 40 and over the age 75 were not recorded in this study due to ACS guidelines.

**Table 11***Income and Mammography Screening Hispanic Women*

		Frequency	Percent
Valid	Less than \$10,000	2	5.0
	\$10,000-\$15,000	2	5.0
	\$15,000-\$20,000	6	15.0
	\$20,000-\$25,000	5	12.5
	\$25,000-\$35,000	2	5.0
	\$35,000-\$50,000	8	20.0
	\$50,000-\$75,000	3	7.5
	\$75,000 or more	6	15.0
	Total	34	85.0
Missing		5	12.5
		1	2.5
	Total	6	15.0
Total		40	100.0

**Independent Sample T-Tests Using Levene Test for Quality Analysis**

Conducting a independent  $t$  tests and Levene's test for quality analysis on education level, income and age, was important while examining the significance and variance between each variable within each group. Levene's test was conducted to verify the variance of answering yes or no to having a mammography screening by socioeconomic income, mammography screening by age, and mammography screening by education among African American women and Hispanic women. Levene's test for quality was conducted to tests the homogeneity of variance. The  $t$  tests for equal means of equality was conducted to determine how significant the differences were between each group. The results present the relationships between mammography screening (dependent

**Table 12***Independent Sample Levene's and T-Test African American Women*

		Levene's Test		t-test	
		F	Sig.	t	df
AGE	Equal variances	3.855	.051	-.379	262
EDUCATION	Equal variances	1.174	.280	1.998	261
INCOME	Equal variances	.593	.442	1.877	199

*Note.* F = Method that SPSS used to run the regression. Sig= significance level. DF= degrees of freedom associated with the sources of variance. T=means of two independent groups to determine whether there is statistical evidence that the associated population.

### **Income and Mammography Screening Among African American Women**

Research question: To what degree, if any, is there a relationship between socioeconomic status and mammography screening among African American women?

An independent sample Levene's and t tests was conducted answering yes or no to having a mammography screening as the independent variable, and income as the dependent variable for African American women. African American women who reported having a mammogram were more likely to report a higher level of income

compared to women who had not had a mammography screening ( $t(199) = 1.877, p = 0.044$ ).

To what degree, if any, is there a relationship between income and mammography screening among African American women? The null hypothesis is, there is no relationship between income, and mammography screening among African American women. The alternate hypothesis is, there is a relationship between income and mammography screening among African American women. The null hypothesis was rejected, because there was a relationship between the two variables among having a mammography screening and income with the alternative hypothesis being accepted with a level of significance  $p < 0.044$  that represents that the independent variable (yes or no to mammography screening) did affect the dependent variable (income). If the  $p$ -value is less than  $p < 0.05$  we can conclude that a significance difference does exist (Greenland et al., 2016).

### **Education and Mammography Screening Among African American Women**

Research question: Research question: To what degree, if any, is there a relationship between education level and mammography screening among African American women? An independent sample Levene's and  $t$  tests was conducted answering yes or no to having a mammography screening as the independent variable, and education level as the dependent variable for African American women. African American women who reported having a mammography screening were likely to have obtained a higher level of education compared to women who have had a mammography screening ( $t(261) = 1.998, p = 0.028$ ).

To what degree, if any, is there a relationship between education level and mammography screening among African American women? The null hypothesis is, there is no relationship between education and mammography screening among African American women. The alternate hypothesis is, there is a relationship between education and mammography screening among African American women. The null hypothesis was rejected, because there was a relationship between the two variables among mammography screening and education with the alternative hypothesis being accepted with a level of significance of  $p < 0.028$  that represents that the independent variable (yes or no to mammography screening) did affect the dependent variable (education level). If the  $p$ -value is less than  $p < 0.05$  we can conclude that a significance difference does exist (Greenland et al., 2016).

### **Age and Mammography Screening Among African American Women**

Research question: To what degree, if any, is there a relationship between age and mammography screening among African American women? An independent sample Levene's and t tests was conducted using the SPSS statistical quality analysis as answering yes or no to having a mammography screening as the independent variable, and age as the dependent variable for African American women. There was not a significant difference in age between African American women who had obtained a mammography screening, compared to women who had not had a mammography screening ( $t(262) = 0.379, p = 0.051$ ).

To what degree, if any, is there a relationship between age and mammography screening among African American women? The null hypothesis is, there is no

relationship between age and mammography screening among African American women.

The alternate hypothesis is, there is a relationship between age us and having a mammography screening among African American women. The null hypothesis was accepted, with a level of insignificance  $p < 0.051$ , and the alternative hypothesis was rejected with a higher level of insignificance. Significance larger than  $p < 0.05$ , we can conclude that a significance does not exists (Greenland et al., 2016).

**Table 13**

*Independent Sample Levene's T-Test for Mammography screening Hispanic Women*

		Levene's Test		t-test	
		F	Sig.	t	df
AGE	Equal variances	2.935	.095	-.639	36
EDUCATION	Equal variances	.0191	.665	-.437	36
INCOME	Equal variances	.911	.347	.689	31

*Note.* F =This column tells you the method that SPSS used to run the analysis. Sig= significance level. DF= degrees of freedom associated with the sources of variance. T=means of two independent groups to determine whether there is statistical evidence that the associated population.

### **Age and Mammography Screening Among Hispanic Women**

Research question: To what degree, if any, is there a relationship between age and mammography screening among Hispanic Women? An independent sample Levene's and t tests was conducted using SPSS statistical quality analysis with yes or no to having a mammography screening as the independent variable, and age as the dependent variable, for Hispanic women. There was not a significant difference in age between Hispanic women who had obtained a mammogram between who had not had a mammography screening ( $t(36) = 0.639, p = 0.095$ ).

To what degree, if any, is there a relationship between age and mammography screening among Hispanic Women? The null hypothesis was accepted, because the dependent variable (mammography screening) does not affect the independent variable (age), and the alternative hypothesis was rejected with a level of insignificance  $p < 0.095$ . If the p-value is more than  $p < 0.05$  we conclude that a significance does not exist (Greenland et al., 2016).

### **Education and Mammography Screening Among Hispanic Women**

Research question: To what degree, if any, is there a relationship between education level and mammography screening among Hispanic Women? An independent sample Levene's and t tests was conducted in the SPSS statistical analysis as answering yes or no to having a mammography screening as the independent variable, and education level as the dependent variable for Hispanic women. There was not a difference in education level between Hispanic women who reported having a mammogram between those who had not had a mammography screening ( $t(36) = 0.437, p = 0.665$ ).

To what degree, if any, is there a relationship between education level and mammography screening among Hispanic Women? The null hypothesis is, there is no relationship between education and mammography screening among Hispanic women. The alternate hypothesis is, there is a relationship between education and answering yes or no to having a mammography screening among Hispanic women. The null hypothesis was accepted, because one variable (mammography screening) does not affect the other variable (Education), and the alternative hypothesis was rejected with a level of insignificance  $p < 0.665$ . If the  $p$ -value is more than  $p < 0.05$  we conclude that a significance does not exist (Greenland et al., 2016).

### **Income and Mammography Screening Hispanic Women**

Research question: To what degree, if any, is there a relationship between income and mammography screening among Hispanic Women? An independent sample Levene's and t tests was conducted in the SPSS statistical analysis as answering yes or no to having a mammography screening as the independent variable, and income as the dependent variable for Hispanic women. There was a difference in income between Hispanic women who answered yes or no to having a mammogram and those who had not had a mammography screening ( $t(31) = 0.689, p = 0.347$ ).

To what degree, if any, is there a relationship between income and mammography screening among Hispanic Women? The null hypothesis is, there is no relationship between income and mammography screening among Hispanic women. The alternate hypothesis is, there is a relationship between income and mammography screening among Hispanic women. The null hypothesis was rejected, because there was a



relationship between the two variables among having a mammography screening and income with the alternative hypothesis being accepted with a level of significance  $p < 0.347$  that represents that the independent variable (mammography screening) did affect the dependent variable (income). If the  $p$  value is less than  $p < 0.05$  we conclude that a significance difference does exist.

### **Summary and Conclusion**

The data represented in this section, represent secondary datasets and results using SPSS statistical software, running a quantitative correlational design that helped me determine the outcome of the following research questions: To what degree, if any, is there a relationship between age and mammography screening among African American and Hispanic women? To what degree, if any, is there a relationship between education level and mammography screening among African American and Hispanic women? To what degree, if any, is there a relationship between income and mammography screening among African American and Hispanic women?

The study concludes that factors contributing to mammography screening among African American and Hispanic women prevents early diagnosis of breast cancer among these two groups. Section four includes the application to professional practice and implications for social changes for the study. The section will also include summary of key findings, limitations of the study, and recommendations for future research.

## Section 4: Application to Professional Practice and Implications

### **Introduction**

The purpose of the study was to examine the statistical relationship between income, education level, age, and mammography screening among African American and Hispanic women between 2019 and 2021. In this quantitative study, SPSS statistical software was used to perform a Levene's and t-tests analysis that determine the relationship among the variables. The study outcomes provide readers information on the importance of mammography screening was among African American and Hispanic women to detect breast cancer.

The mortality rates (deaths) for breast cancer have been ranked the highest among African American and Hispanic women and are linked to factors like income, education, access to healthcare, and beliefs contributing to mammography screening (Ahmed, 1992). According to ACS guidelines, women of 40 and 54 years of age should have a mammography every year, and women 55 and 74 every 2 years. Women who have had a mammography screening within the past 1 to 2 years between 2019-2021 were considered up to date for this study (Khan & Chollet, 2021).

### **Analyzing and Interpreting the Findings in TCSB**

Based on the results of the study, the TCSB constructs support the study. The TCSB constructs consist of three contributing components that support why individuals do or do not receive mammography screening (Ahmed et al., 2017). Those three components of the theory are income, education level, and age. The TCSB constructs that were represented in the study as external factors, external factors are considered factors,

such as education level, age, and income. The TCSB constructs align with the study because they predict why people do or do not participate in mammography screening.

The analysis that I completed, examining the independent sample Levene's, and *t* tests, demonstrated that there was a relationship among the variables between mammography screening between 2019 and 2021, education, and income, and there was not a significant relationship between mammography screening and age. Molina et al. (2017) stated that noncompliance actions on why people do or do not participate in mammography screening has been a major influence by income and demographic factors among African and Hispanic women. The sample size consisted of a total 280 (87.5%) African American, whereas 40 (12.5%) of the sample were Hispanic women.

Specifically, 13 (4.1%) of the women (eight African American and five Hispanic women) had an elementary education, 38 (11.9%) of the women (35 African American and three Hispanic women) had some high school education, 98 (30.6%) of the women (88 African American and 10 Hispanic women) were a high school graduate, 90 (28.1%, comprised 76 African American and 14 Hispanic women) had some college or technical degree, 80 (25.0%, including 72 African American and eight Hispanic women) were college graduates, and one (0.3%) did not provide any education background. African American who reported having a mammography screening within the past 2 years were more likely to have obtained a higher level of education with a significance of  $p = 0.047$ . Hispanic women who reported having a mammography screening within the past 2 years were not likely to have obtained a higher level of education with an insignificance of  $p = 0.665$ .

Half the population, 79 African American and 15 Hispanic women, made \$25,000 or less. Three-quarters of the women 238 (74.4%) have had a mammogram screening in the last 2 years, with 212 of those women being African American and 26 Hispanic. African American women who reported having a mammography screening within the past 2 years were more likely to report a higher level of income compared to women who have not had a mammography screening with a significance of  $p = 0.062$ . There was a significance in income between Hispanic women who reported having a mammogram between 2019 and 2021 and those who have not had a mammography screening with a significance of  $p = 0.496$ .

The research data and literature support the findings of the study that there were significant barriers among the African American and Hispanic women to mammography screening (CDC, 2020). According to the American Cancer Society (2019), 13% of women in the United States will develop some type of breast cancer in their life, with an increasing rate of 0.5% per year, according to the American Cancer Society (2019). Hispanic women have the highest survival rate for breast cancer at 96%, whereas African Americans have a survival rate of 93% (American Cancer Society, 2019).

### **Limitations of the Study**

One limitation of the study was missing responses from African American women and education level with a total of one (0.3%) who did not respond. Seventy-six African American and six Hispanic a total of 23.8% of women of the sample population did not respond to income that adhered to a limitation of the study. Information provided in the

study remains dependable due to the quality of the research, but with missing responses from the participants it does affect external validity.

Another limitation was the analyses of the study findings in the context of the BRFSS 2021 due to secondary data being used and gathered by the BRFSS 2021 as self-reported surveys. Self-reported data are considered to affect the reliability and validity of the results, due to the possibility of bias in the information gathered. Biased overestimates of mammography screening use may have serious adverse clinical and public health consequences (Levine et al., 2019). Because the data were self-reported by participants, there was nothing to prove that participants were truthful when they answered the survey questions.

### **Recommendations**

The study represented that there was a significance between education level and income pertaining to mammography screening between 2019 and 2021. The goal of the study was to determine whether a relationship existed between the variables age, education level, and income and answering yes or no to having a mammography screening among African American and Hispanic women. Data were available on demographics, education level, and income; however, there were a small population size among the Hispanic women in Kansas City, Missouri, who participated in the study, but the sample population size did meet the minimum requirement for the sample. Not much literature was available on other contributing factors among African American and Hispanic women regarding mammography screening. A recommendation would be to have larger population samples and more research literature with the focus of factors

contributing to mammography screening within the African American and Hispanic population. Another recommendation is to create a study using qualitative research to compare the two groups that would tell their own reasons for choosing to get mammography screenings or not. Using a qualitative method could help determine other barriers that affects the two populations, eliminating any biased information.

Recommendations can be determined for future research on mammography screening among African American and Hispanic women. Using a larger minority population group for studies pertaining to mammography screening is a recommendation by the researcher. The study provided by the BRFSS 2021 had a predominance of White individuals in the Kansas City, Missouri, mammography screening survey than any other race. I also suggest offering incentives to encourage more minority women to participate in research studies. Incentives could include gift cards, free passes for theme parks, bus passes, and so forth. According to Yu (2017), offering incentives does not create bias if they are equally effective across all sample members, in which case they are unlikely to affect nonresponse bias.

The use of secondary data made the study a quantitative research method. After determining the limitations of the study for improvements, it would have been best to perform a mixed method approach on the study, or a qualitative research method approach with the primary data that were being used. Collecting and formatting primary data takes longer collecting and formatting, but it allows the researcher to eliminate any bias and invalidated information from being used (Bhat, 2020).

The study identified factors contributing to mammography screening among African American and Hispanic women. Income was a contributing factor to breast cancer mortality rates among the African American and Hispanic women. Late diagnosis and late treatments in breast cancer often resulted in lack of mammography screening (Rivera et al., 2018). The TCSB constructs was the theory used that aligned with the study that represented the contributing factors affecting mammography screening on why people do or do not participate (Relecom et al., 2018). The TCSB constructs that represent the external factors of the study were income, education, and age. The TCSB theory suggested that low use in mammography screening were due to lack of education level, income, and age (Relecom et al., 2018).

My final recommendation for the study would involve stakeholders, healthcare facilities, government agencies, public health departments, and policy makers to advocate, educate, and promote, preventative healthcare measures, such as mammography screening to all levels of socioeconomic barriers and all population groups. Preventative measures could be implemented by creating outside community events, involving health education pamphlets, free services, and prizes that are rewarded. Making mammography screening a priority in preventative healthcare services could help decrease the mortality death rates across the nation (Sharma et al., 2020).

### **Implications for Professional Practice and Social Change**

#### **Professional Practice**

From a professional practice standpoint, findings from the study could help guide healthcare organizations by acknowledging the barriers among mammography screening

within the minority populations with early breast cancer detection. Healthcare organizations and providers would be able to educate the importance of mammography screening and provide African American and Hispanic women with better healthcare resources that better avoid the barriers that may be preventing individuals from using mammography screening. Facilitating access to breast cancer screenings would help increase the outcomes of breast cancer screening use (Henderson et al., 2020).

Identifying contributing factors affecting the two target populations could help identify intervention and preventative measures to target populations represented as vulnerable populations. Addressing the barriers that are preventing mammography screening could also help improve TCSB constructs that are contributing factors to whether an individual decides to participate in preventative health screening. Outreach on the radio stations and on tv shows with creative commercials and advertisements could help reach more vulnerable populations. Incorporating better foundations for seeking preventative breast care screening is instrumental to reduce the contributing factors affecting breast cancer mortality rates (Peek et al., 2004).

### **Positive Social Change**

Acknowledging the barriers that are affecting mammography screening among African American and Hispanic women could help with developing a prevention and intervention program that tackles the barriers affecting mammography screening. Tackling the barriers, such as low income, lack of health insurance, language barriers, and poor educational knowledge could help African American and Hispanic women



receive the healthcare services they need. Resolving these barriers could also help with early breast cancer detection and decrease in mortality rates among breast cancer.

Positive social change should start within the healthcare organizations by influencing the use of mammography screenings. Organizations can work to decrease barriers affecting mammography screening by organizing community events for urban and rural areas, free mammography screening events, and other community events that brings mammography screening awareness. Incorporating positive social changes within the healthcare organizations and agencies would help create new healthcare policies, which requires women to get a mammogram screening every year starting at the age of 45, state medical assistance programs, such as Medicaid and Medicare that automatically pay for preventative health services, delivery of care, by sending out reminder postcards, phone calls and text messages with pre booked appointments, outsourcing to other medical low-income programs, and communication between the physicians and the patients. Positive social changes will help increase the awareness for the African American and Hispanic populations.

According to Janet and Denita et al., (2016) social change has been a concept that most individuals sometimes take for granted or just may not understand it. Social change could be considered as changes in human interactions and forms of relationships that transform social and cultural institutions (Allicock et al., 2013). Educating and recognizing that disparities exist among African American and Hispanic women towards breast cancer screening is the first step in seeking research on why the TCSB theory contributes to social change (Yedjou et al., 2019).

## Conclusion

The findings of the study were useful and meaningful for healthcare leaders. In summary, the focus of the study was to determine whether a relationship exists between mammography screening among African American and Hispanic women, operationalized by education level, age, and income between 2019 and 2021, women 40 and 74 years of age. The *t* tests and Levene's test were conducted and showed a statistically significant relationship between education level, income, and mammography screening among African American women. Hispanic women and education level had a statistically significant difference, also with income among mammography screening. Age between African American and Hispanic women had no statistical relationship among mammography screening between 2019 and 2021.

The result of the study suggests that contributing factors such as education level, income, and mammography screening among African American and Hispanic women determines why individuals choose to participate or not participate in mammography screening. There was alignment between TCSB theory and mammography screening in African American and Hispanic women 40 and 74 years of age; the statistical analyses aligned with TCSB constructs that focused on contributing factors that affected their healthcare decisions on whether to participate in mammography screening.

The results of the finding were submitted for publication as peer reviewed article among Walden University and other libraries and universities for other scholars and researchers to obtain data. Sharing the results with other organizations could bring awareness of how important how the contributing factors to breast cancer screening

affects the outcome for participating in mammography cancer screenings. Results of the study could help medical organizations in reaching out to the vulnerable populations with preventative service measurements. There have been huge gaps in preventative services contributing to barriers to breast cancer screening due to outreach techniques used by healthcare organizations and private sectors; thus, this has been a major issue due to the high rates of breast cancer mortality rates (International Agency for Research on Cancer, 2016). Recommendations can be made to educate the outcomes of the measurements to healthcare administrators in the United States health sector with high mortality rates of breast cancer. Recognizing social change of this kind represents a desirable envisage of the study results, which is aligned with social change. Walden University advocates for practical social change, which includes changes within human interactions, individuals, groups, and relationships that transform social and cultural change.

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