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Breastfeeding Information and Breastfeeding Duration Among African American Women With a Family History of Breast or Ovarian Cancer

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Walden University
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Abstract

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by

Aleatha Johnson

MS, Texas Southern University, 2005

BS, Abilene Christian University, 2002

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

May 2021

Abstract

Decades of research supports the notion that breastfeeding may help prevent breast and ovarian cancer in women. Women with a family history of these cancers are at greater risk. African American women have the lowest breastfeeding rates, yet the highest breast and ovarian cancer mortality rates. No studies have been conducted exploring the impact of being informed about breastfeeding from health care providers, breastfeeding support services, or family and friends and the relationship between their knowledge of family history of breast or ovarian cancer and breastfeeding duration for African American women. The purpose of this quantitative study was to determine whether breastfeeding information received could influence breastfeeding duration among African American women with a family history of breast or ovarian cancer. The theory of planned behavior provided the theoretical framework. The research questions examined relationships between knowledge of family history of breast or ovarian cancer, breastfeeding information received, and breastfeeding duration. Breastfeeding information received was the mediating variable. Using a cross-sectional, correlational design, data from the 2018 Michigan Pregnancy Risk Assessment Monitoring System (n = 792) were obtained. One-way ANOVA and binary logistic regression analyses were conducted to examine the associations between the main effects hypotheses, and the Hayes PROCESS analysis was used to examine mediation. There were no statistically significant associations between the variables. Implications for positive social change include improvement of breastfeeding education by raising awareness about the connection between breastfeeding, breast and ovarian cancer, and family history of these cancers.

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Dedication

I would like to dedicate this to my children, their children, and all their offspring. May you be empowered to pursue your dreams. When you do, don’t forget to reach back to help someone else.

Acknowledgments

First and foremost, I want to thank God for all that He has done to shape me into who I am today. I look forward to continued opportunities to grow more into the purpose He has for my life.

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Chapter 1: Introduction to the Study

Introduction

Breastfeeding optimizes many health advantages for mothers and babies. Although nearly 81% of women in the United States initiate breastfeeding, by 6 months postpartum, breastfeeding rates drop 21% (Centers for Disease Control and Prevention [CDC], 2018). African American women have the lowest breastfeeding rates yet the highest breast and ovarian cancer mortality rates compared to other racial groups (Anstey, Shoemaker et al., 2017; Ross-Cowdery et al., 2017). Evidence suggests a connection between family history of breast and ovarian cancer, including the genetic sequences, mutated Breast Cancer 1 and 2 (mBRCA 1 and 2), and increased breast and ovarian cancer risks (Jones et al., 2017; Lin et al., 2019). Moreover, mortality rates are higher among African American women who experience the more aggressive form of breast cancer, known as triple negative breast cancer (TNBC), a mBRCA 1 tumor suppressor gene, yet breastfeeding has been shown to significantly decrease risks (Anstey et al., 2017).

Numerous factors are involved when determining the reasons for the declining rates in breastfeeding among women. The reasons for the declining rates may be attributed to lack of knowledge, social norms, poor family and social support, perceived lactation problems, employment and childcare, and barriers related to health care services (CDC, 2020.). In addition to the common breastfeeding barriers women face, African American women report an array of complex barriers that are not completely understood; however, it is generally agreed that the primary reason for African American women not initiating or continuing to breastfeed is related to inadequate maternal health education and knowledge of genetic risks (Anstey et al., 2017; Meisel et al., 2017).

Over the years, considerable research attention has been directed toward the relationship between breast and ovarian cancer family history and cancer risks. Evidence supports that raised awareness and conversations about breastfeeding from health care providers, lactation services, and family and friends have a significant impact on improving the initiation and duration of breastfeeding (Gözükara & Taşkın, 2014; Tuan et al., 2014). Similarly, several researchers have concluded that the greater the breastfeeding awareness, the greater the chances that women will initiate and continue breastfeeding (da Silva et al., 2009; Tadesse et al., 2018). However, there is limited research on how breastfeeding awareness may influence breastfeeding behavior among African American women with knowledge of a family history of breast and ovarian cancer. In this study, I explored the association between breastfeeding duration, breast or ovarian cancer family history, and breastfeeding awareness among African American women, resulting from interactions with health care providers, breastfeeding support services, or family and friends.

In Chapter 1, I will describe the study, explain the rationale for it, and discuss the potential social change implications. I will offer a brief summary of pertinent literature, while highlighting the gap in knowledge and overall importance of the study. Framed by previous studies, the problem statement of this chapter will consist of supporting evidence that a potential relationship exists between knowledge of breast and ovarian cancer family history, breastfeeding awareness, and breastfeeding duration. The theoretical framework will be explained as it relates to the research questions. Lastly, the rationale for the study design, key variables, definitions of significant terms, meaningful assumptions, scope and delimitations, limitations, and implications for positive social change will all be addressed in this chapter.

Background of the Study

Historical Framework

Evidence supports the notion that breastfeeding may prevent breast cancer in women (Anstey, Shoemaker et al., 2017). The relationship between breast cancer and reproductive risk factors became evident during the 18th century, when scientist Bernadino Ramazzini was the first to write about the high incidence of breast cancer among nuns compared to other women (Horn & Vatten, 2017). Since then, many more scientists from various disciplines have extracted from and built on Ramazzini's work.

By the late 1800s, George Beatson, a British surgeon, studied lactation of lambs, rabbits, and cows and mammary tissues, which led to the speculation that an association existed between lactation, the ovaries, and breast cancer (Beatson, 1896). A few years later, Leo Loeb, an American pathologist, experimented with mice to confirm that cancer may be caused by hereditary factors (Lathrop & Loeb, 1918). Along with works conducted by other notable scholars, the discoveries made by Beaston and Leob provided the impetus for public health inquiry into female reproductive cancers (Horn & Vatten, 2017).

Jane Lane-Claypon was the first to conduct a case-control epidemiologic study on breast cancer and reproductive risk factors (Horn & Vatten, 2017; Lane-Claypon, 1926).

Claypon's research confirmed previous findings from earlier researchers that parity and lactation were associated with breast cancer risk. In one of the first retrospective breast cancer studies conducted, Lane-Claypon discovered an association between breast cancer and family history (Horn & Vatten, 2017). Although many of the discoveries made by earlier scientists were not initially accepted by all in the scientific community, their work set the direction.

Three Hundred Years Later

Research on breastfeeding and risk factors for not breastfeeding continues to expand. Much of the previous work on breastfeeding has focused on risk factors and health benefits for both mother and child. While this is important, there are no studies on how breastfeeding information from health care providers, breastfeeding support services, and family and friends may influence breastfeeding behavior among women with a family history of breast and ovarian cancer.

Informed individuals are better equipped to make health behavior decisions compared to when they are unaware of the risk factors associated with chronic disease with a genetic link and health behavior modifications (Prichard et al., 2015) Likewise, women who partake in frequent discussions about breastfeeding with their health care provider, childbirth educator, or supportive family members and friends have higher chances of initiating and continuing breastfeeding (Gözükara & Taşkın, 2014; Thrower & Peoples, 2015). Tadesse et al. (2018) concluded with similar findings that family members who are informed about breastfeeding can significantly impact a woman's breastfeeding decision.

As Obeng et al. (2015) concluded, mothers who are informed about breastfeeding will likely choose to breastfeed. This finding is congruent with the work of Anstey et al. (2017), whose African American study participants stated that breastfeeding information was not included in their prenatal office visit. Participants also reported that if they were informed about the protective health benefits that breastfeeding provided for breast cancer prevention, they would have considered breastfeeding. Ross-Cowdery et al. (2017) provided a brief counseling session on the maternal health benefits of breastfeeding to low-income pregnant Black women; nine conditions were highlighted in the counseling sessions, including breast and ovarian cancer. Health conditions linked to family history were also discussed during the counseling sessions. After these counseling sessions, 73% of the participants reported they would try to breastfeed their baby. Overall, breastfeeding intentions improved because of the counseling sessions; however, Ross-Cowdery et al. (2017) made recommendations that future studies should determine if women are likely to go beyond intentions to breastfeed when they are given information on the maternal health benefits of breastfeeding. The current study was conducted to build on Ross-Cowdery et al.'s (2017) assertion by determining if receiving breastfeeding information plays a role in whether African American women with a family history of breast and ovarian cancer initiate and continue breastfeeding.

Breastfeeding Education Disparities

Breastfeeding education is not distributed equitably among racial groups. According to Jones et al. (2015), adequate promotion of breastfeeding and its benefits is not shared with low-income women. Lind et al. (2014) went even further and claimed that birth facilities located in zip codes with a high population of African Americans do not exercise maternity practices in favor of breastfeeding. These findings suggest that the lack of breastfeeding information being disseminated in low-income communities hinders breastfeeding decision making. Thus, if African American women were informed about breastfeeding, they would be given the opportunity to make infant feeding decisions based on enhanced breastfeeding knowledge. Furthermore, da Silva et al. (2009) suggested that frequent prenatal consultations improve breastfeeding knowledge and will likely influence breastfeeding behavior. Additionally, breastfeeding education disparities will decline among the African American community.

African American women with a family history of breast and ovarian cancers, have an increased risk for developing these same cancers (Anstey, Shoemaker et al., 2017). Such women may benefit from receiving information about breastfeeding, which may facilitate favorable breastfeeding behaviors and a reduction in breast and ovarian cancer rates for high-risk women. This study is essential to discovering the potential to improve breastfeeding rates and reduce breast and ovarian cancer mortality by way of providing nonspecific breastfeeding information to women at higher risk.

Problem Statement

The problem is that African American women have lower initiation and duration rates of breastfeeding compared to women in other racial groups, increasing the risks of breast and ovarian cancer among African American women (CDC, n.d.a; Jacobson et al., 2015; Ross-Cowdery et al., 2017). African American women experience higher breast and ovarian cancer mortality rates (Anstey et al., 2017; Ross-Cowdery et al., 2017).

Genetic factors are strongly related to higher incidence of breast and ovarian cancers (Srivastava et al., 2017). Evidence suggests that women with a first-degree relative who had ovarian cancer are three times more likely to also develop ovarian cancer (Jones et al., 2017); breastfeeding can reduce the risk of developing ovarian cancer (Moorman et al., 2016; Sung et al., 2016). Specifically for breast cancer, African American women are at higher risk for experiencing TNBC, which is an inflammatory breast cancer that presents a poor prognosis for survival (Ambrosone et al., 2014; Elshamy, 2016; Islami et al., 2015; Stecklein et al., 2017). Breastfeeding has been shown to reduce the risk of TNBC by 20% (Islami et a., 2015).

While research provides evidence that the risks from genetic factors of breast and ovarian cancers can be reduced by breastfeeding, no studies have been conducted in which researchers explored the extent to which African American women are informed about breastfeeding from health care providers, breastfeeding support services, or family and friends and the relationship between their knowledge of family history of breast and ovarian cancer and breastfeeding behavior.

Purpose

The purpose of this quantitative study was to determine whether breastfeeding information from health care providers, breastfeeding support services, or family and friends could influence breastfeeding duration among African American women with a family history of breast or ovarian cancer. The independent variable was defined as information received from health care providers, breastfeeding support services, or family and friends. The independent variable that was considered the mediating variable was defined as knowledge of family history of breast or ovarian cancer. The dependent variable was defined as breastfeeding duration.

Research Questions and Hypotheses

The following research questions and corresponding hypotheses guided this study:

RQ1: Is there an association between knowledge of family history of breast or ovarian cancer and breastfeeding duration?

$H_0$1: Knowledge of family history of breast or ovarian cancer is not associated with breastfeeding duration.

H_A1: Knowledge of family history of breast or ovarian cancer is associated with breastfeeding duration.

RQ2: Is there an association between knowledge of family history of breast or ovarian cancer and breastfeeding information received from health care providers, breastfeeding support services, or family and friends?

$H_0$2: Knowledge of family history of breast or ovarian cancer is not associated with breastfeeding information received from health care providers, breastfeeding support services, or family and friends.

H_A2: Knowledge of family history of breast or ovarian cancer is associated with breastfeeding information received from health care providers, breastfeeding support services, or family and friends.

RQ3: Is there an association between breastfeeding information received from health care providers, breastfeeding support services, or family and friends and breastfeeding duration?

> $H_0$3: Breastfeeding information received from health care providers, breastfeeding support services, or family and friends is not associated with breastfeeding duration.
>
> H_A3: Breastfeeding information received from health care providers, breastfeeding support services, or family and friends is associated with breastfeeding duration.

RQ4: Does receiving breastfeeding information from health care providers, breastfeeding support services, or family and friends mediate the relationship between knowledge of family history of breast or ovarian cancer and breastfeeding duration?

> $H_0$4: Receiving breastfeeding information from health care providers, breastfeeding support services, or family and friends does not mediate the relationship between knowledge of family history of breast or ovarian cancer and breastfeeding duration.
>
> H_A4: Receiving breastfeeding information from health care providers, breastfeeding support services, or family and friends does mediate the relationship between knowledge of family history of breast or ovarian cancer and breastfeeding duration.

Theoretical Framework

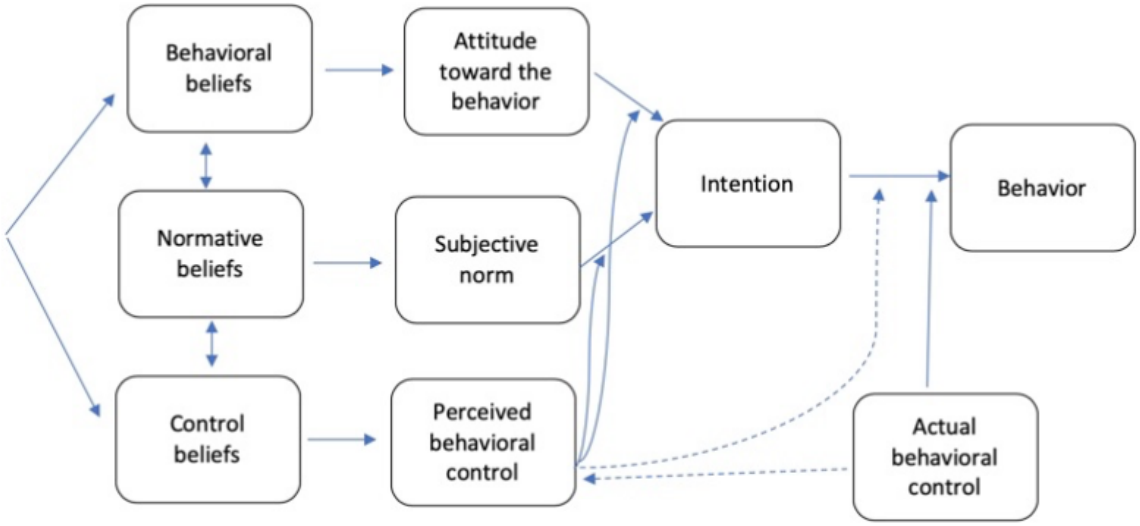
Derived from the theory of reasoned action (TRA), the theory of planned behavior (TPB) will serve as the theoretical framework for this study. TPB has been useful for predicting health-related behaviors, such as breastfeeding (Guo et al., 2016; Montaño & Kasprzyk, 2015). According to Ajzen (1991), an individual's behavior is motivated by their knowledge and intentions. Once intentions are established, behavior initiation and maintenance follow (Guo et al., 2016). Thus, women who are informed about breastfeeding can make informed infant feeding decisions, which forges breastfeeding behavior.

Additionally, an individual's attitude, subjective norms, and perceived control shapes their response to behavior (see Figure 1; Ajzen, 1991). Health care professionals promote breastfeeding by informing women about the benefits of breastfeeding, which helps shape a positive attitude toward breastfeeding (Guo et al., 2016). Through time, this creates a subjective norm in which, in a social context, breastfeeding is viewed as socially acceptable (Guo et al., 2016). Lastly, perceived behavioral control is a predictor of breastfeeding behavior when an individual has a pro-breastfeeding attitude and a level of confidence in their ability to breastfeed (Guo et al., 2016). In one meta-analysis, perceived behavioral control was found to be a strong predictor of breastfeeding intention and a weak association with initiation (Guo et al., 2016), which justifies the reality that many women have a desire to breastfeed, but multiple factors affect breastfeeding behavior. Thus, it is important to address these factors to increase the likelihood of women reaching their intended breastfeeding goals, yet Guo et al. (2016) noted that it is unlikely to successfully address all factors in a single study.

Because TPB addresses beliefs, attitudes, subjective norms, perceived behavioral control, and intentions, the theory is useful for predicting actions of health behaviors (see Figure 1; Montaño & Kasprzyk, 2015), which will be discussed in more detail in Chapter 2. For this study, predictions can be made regarding future breastfeeding practices when women with a family history of breast and ovarian cancer are informed about breastfeeding from a health care provider, breastfeeding support services, or family and friends.

Figure 1

Theory of Planned Behavior Diagram



Note. Adapted from *Icek Ajzen Theory of Planned Behavior*, by I. Ajzen, 2019, http://people.umass.edu/aizen/tpb.diag.html#null-link. Copyright 2019 by Icek Ajzen. Reprinted with permission.

Nature of the Study

This study was a quantitative secondary analysis. A quantitative study design offers statistical measures on the relationship between knowledge of family history of breast and ovarian cancer and breastfeeding practices as influenced by breastfeeding information provided by health care providers, breastfeeding support services, and family and friends. The Pregnancy Risk Assessment Monitoring System (PRAMS) questionnaire was used as the secondary data source to define all variables. Forty-seven states currently participate in PRAMS surveillance (CDC, 2021). PRAMS is a population-based surveillance system that collects data on maternal attitudes, behaviors, and experiences, pre- and postnatally, with the purpose of reducing maternal and infant morbidity and mortality (CDC, 2021). PRAMS is a retrospective surveillance system, in which each state randomly selects between 1,300 to 3,400 women to participate 2–4 months after giving birth (CDC, 2021).

Breastfeeding information from health care providers, breastfeeding support services, or family and friends was used as an independent categorical variable defined according to Question 34: “Before or after your new baby was born, did you receive information about breastfeeding from any of the following sources?” The subsequent categorical independent variable, knowledge of family history of breast or ovarian cancer, was defined according to Supplemental Question 119, “have any of your family members listed below who are related to you by blood had ovarian cancer”; Health History (HH) 10, “Have any of your other family members who are related to you by blood had ovarian cancer”; HH11, “Have any of your family members listed below who are related to you by blood had breast cancer"; and HH12, "Have any of your other family members who are related to you by blood had breast cancer?" The dependent variable, breastfeeding behavior, was also be used as a categorical variable. Breastfeeding behavior was defined according to Question 35, "Did you ever breastfeed or pump breast milk to feed your new baby, even for a short period of time" and Question 37, "How many weeks or months did you breastfeed or feed pumped milk to your baby?" Question 37 addressed breastfeeding duration and was dummy coded into a categorical variable. A series of one-way analysis of variances (ANOVA) analyses were conducted to determine if there is an association between knowledge of family history of breast or ovarian cancer, breastfeeding duration, and the intervening variable, breastfeeding information received from various forms of support. In addition, a logistic regression analysis was conducted to examine associations between variables in RQ2. IBM SPSS 27.0 was used for data analysis.

Definitions

The independent variable for this study was defined as information received from health care providers, breastfeeding support services, or family and friends. The independent variable, which was considered the mediating variable, was defined as knowledge of family history of breast or ovarian cancer. The dependent variable was defined as breastfeeding duration in weeks.

African American: Anyone residing in the state of Michigan with African ancestry; also referred to as *Black*.

Breastfeeding: The act of feeding a baby from the breast or expressing breast milk with the purpose of feeding a baby through a feeding device (Rasmussen et al., 2017).

Breastfeeding behavior: Breastfeeding or pumping breast milk to feed a newborn, even for a short period of time, or continuing to breastfeed for more than 1 week postpartum.

Breastfeeding duration: Breastfeeding for 1 week or longer.

Breastfeeding initiation: Breastfeeding for 1 week or less.

Breastfeeding support services: Lactation specialist, breastfeeding support groups, or hotlines that assist mothers with breastfeeding questions or situations.

Family history: Related to having a first-degree blood relative who experienced breast and/or ovarian cancer. First-degree relatives are defined as parents, siblings, and children (Ham et al., 2016).

Health care provider: A licensed doctor with authority to practice medicine or other specialist who provides health care services or treatment or medical services.

Knowledge: The acknowledgement of being given information about breastfeeding or family history of breast and ovarian cancer.

Assumptions

The use of secondary data calls for several assumptions to be made. The PRAMS questionnaire is administered during a specific period, 2–4 months postpartum, when new mothers are still adjusting to taking care of a new baby. Thus, in such instances of self-reporting, accuracy in reporting due to social desirability and recall bias are possible. For this study, it was assumed that the survey participants understood the questions and answered accurately. In addition, it was assumed that interviewers who conducted phone surveys were adequately trained to eliminate the potential for interviewer bias. It was also assumed that the questionnaire was culturally appropriate and the phone interviews were delivered in a culturally competent manner.

Scope and Delimitations

The scope of this study hinges on the PRAMS guidelines. Using the PRAMS data set, I examined the relationship that breastfeeding information received from a health care provider, breastfeeding support services, or family and friends has with knowledge of family history of breast or ovarian cancers and breastfeeding duration; only women who identify as African American and who reside in the state of Michigan were included. From the sample of women, only those who provided responses that correspond with both independent and dependent variables were included.

Limitations

The PRAMS questionnaire is primarily administered through the mail; however, some participants may require a phone interview. Interviewers may not understand the significance of certain questions, which could affect how they conduct the interview and document responses. Therefore, researchers must consider the data collected via interview are reported under the perceptions and intentions of the interviewer (Cheng & Phillips, 2014). Another limitation to consider is recall bias. The PRAMS questionnaire is issued within 2–4 months postpartum so participants are able to answer questions about their postpartum experiences (CDC, 2021). During the 2–4-month time frame, new mothers are typically busy getting to know their new routine with their newborn and may not accurately answer some questions or may leave some questions unanswered. Their inability to recall information could potentially affect the integrity of the research study. Additionally, because questionnaires are issued within 2–4 months postpartum, duration of breastfeeding cannot be completely reported for all participants. Lastly, to be included in the national PRAMS data sample, states must meet a 65% response rate (Okeke et al., 2013). The state of Michigan met the 65% response rate requirement in 2018, making PRAMS data available; however, the generalizability of the results from this study are potentially limited to Michigan.

Significance

Because there are strong correlations between breastfeeding and the reduced risk of breast and ovarian cancer and family history of these cancers increases susceptibility, there is an ethical obligation to assure women are informed about breastfeeding. Conversations about breastfeeding may influence more women to initiate breastfeeding and continue for longer periods of time. This is especially true for African American women, who have a higher breast and ovarian cancer mortality rates yet have the lowest breastfeeding rates compared to other racial groups. Thus, messages tailored to African American women may lead to better health outcomes for these women and help improve breastfeeding rates. Findings from this study have implications to change educational techniques when providing breastfeeding information or when raising awareness about the health benefit of breast and ovarian cancer prevention to high-risk populations. Moreover, the findings from this study can be used to strengthen partnerships with organizations that educate African American women on breast and ovarian cancer prevention.

Summary and Transition

Breastfeeding can reduce a woman's risk of developing ovarian and breast cancer. African American women have the lowest breastfeeding rates, yet they experience the highest mortality rates from breast and ovarian cancers. Women with a family history of breast and ovarian cancer have increased risk factors for developing cancer. The breastfeeding information provided to these high-risk women may improve breastfeeding rates. Women who are knowledgeable about the association between breastfeeding and breast and ovarian cancer risk reduction are better equipped to make an informed decision to initiate and continue breastfeeding for longer periods. The PRAMS data set was used to determine if the breastfeeding behavior of the African American women with a family history of breast or ovarian cancer is influenced by the breastfeeding information provided by health care providers, breastfeeding support services, or family and friends.

The impact of the dissemination of breastfeeding information from various sources and how it relates to breastfeeding decision making and behavior will be explored in Chapter 2. The theoretical foundation will also be discussed in the context of similar research studies in which researchers applied the theory, and the outcomes that support the current study will be explained.

Chapter 2: Literature Review

Introduction

Ongoing scientific evidence reinforces the many health benefits of breastfeeding for both mother and baby (Ross-Cowdery et al., 2017). Infants who receive breast milk have greater protection from bacteremia, diarrhea, respiratory tract infections, ear infections, urinary tract infections, sepsis, diabetes, certain cancers, and overweight/obesity (American Academy of Pediatrics [AAP], 2021). Furthermore, the maternal health benefits of breastfeeding include decreased postpartum bleeding, faster healing of the uterus, delayed start to menstruation, healthier child spacing, promotion of weight loss, decreased risk of postpartum depression, and decreased risk of breast and ovarian cancers (AAP, 2021). Due to the numerous health benefits of breastfeeding, encouraging women to breastfeed has increasingly become a public health focus (Brown, 2017).

In spite of numerous public health interventions, the breastfeeding rates among African American women fall below that of women in other racial groups, yet African American women experience the highest mortality rates for breast and ovarian cancers (Anstey et al., 2017; CDC, 2020.; Jacobson et al., 2015; Ross-Cowdery et al., 2017). According to the 2011–2015 National Immunization Survey (NIS), breastfeeding initiation rates were significantly lower for Black infants in 34 states compared to other races (Anstey, Chen et al., 2017). Moreover, the breastfeeding rates for the infants who were breastfed, according to the NIS survey, continued to decline as the months progressed (Anstey, Chen et al., 2017). Returning to work, lack of education, lack of self-efficacy, cultural social norms and beliefs, and lack of support have been discussed as common barriers to breastfeeding initiation and duration (Anstey, Chen et al., 2017; Louis-Jacques et al., 2017; Thrower & Peoples, 2015). The complex nature of addressing breastfeeding barriers is evident, and deciding which approaches to improving breastfeeding rates are effective, sustainable, and culturally responsive poses a significant challenge to the public health sector.

In the absence of an understanding of the barriers that deter African American women from breastfeeding, it is challenging to design interventions that are effective, sustainable, and culturally responsive. Insufficient maternal health education is a primary reason for the low breastfeeding rates among African American women (Thrower & Peoples, 2015). Childbirth educators and health care providers are primarily responsible for offering multiple opportunities for women to learn about breastfeeding, considering frequent opportunities increase the likelihood that a woman will breastfeed (Thrower & Peoples, 2015). Another unique finding among numerous researchers is that African American women face a significant barrier of lack of exposure to breastfeeding influence and support from a sociocultural standpoint (Alghamdi et al., 2017; Anstey, Shoemaker et al., 2017; Ganju et al., 2018; Kim et al., 2017). Recent studies have confirmed that women in general are not aware that breastfeeding provides protection against breast and ovarian cancers and is critically significant for women with a family history of these cancers (Ham et al., 2016; Meisel et al., 2017; Rehman et al., 2017; Rodriquez, Gyure et al., 2015). Given this evidence, it is critical to raise awareness among African American women by employing key platforms to inform them of the importance of breastfeeding.

In the literature on breastfeeding and breast and ovarian cancer prevention, there seems to be a general agreement that women with a genetic predisposition to breast and ovarian cancers would benefit from being informed about breastfeeding. Furthermore, it is agreed that health care providers, breastfeeding educators, and sociocultural influences each have significance for impacting breastfeeding behavior among African American women. In this chapter, I explain further the theoretical framework and how it relates to the current research study. In addition, I discuss an exhaustive review of mainly current research literature to support the scope of the study.

Literature Search Strategy

In preparation for this literature review, I used the Walden University Library, Google, and Google Scholar search engines to obtain pertinent literature. Databases, such as EBSCOhost, ProQuest Health & Medical Collection, ProQuest Nursing & Allied Health Source, Embase, PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Medline combined search, CINAHL Plus with full text, Medline with full text, PLOSONE, and Sage were used to search for related articles. Key terms enlisted for this search included: *cancer, family history, behavior, breastfeeding education, maternal health benefits, awareness and/or education, family support, social support, African American or Black, health care provider, breastfeeding support, lactation support, breastfeeding awareness and/or education, theory of planned behavior, Ajzen, knowledge, family history of cancer, breastfeeding benefits, breastfeeding barriers, breastfeeding obstacles, breastfeeding challenges, breastfeeding difficulties, breastfeeding issues, breast cancer, ovarian cancer*, and *Michigan*. Boolean operators were applied to narrow down the search, and I used the advanced search option for peer-reviewed articles.

Theoretical Foundation

Multiple factors play a role in infant feeding decision making. Altogether, women choose to breastfeed based on influencing factors, such as knowledge of breastfeeding benefits; social, professional, and family support; sociodemographic influences; clinical characteristics of women; personal experiences; family traditions; and personal choice (Canicali Primo et al., 2016). The current literature on breastfeeding emphasizes the importance of addressing breastfeeding barriers through educational platforms according to the needs of the target community (Anstey, Shoemaker, et al., 2017; Obeng et al., 2015; Rehman et al., 2017). Dissemination of breastfeeding information will not only improve knowledge of breastfeeding but may improve breastfeeding practices (Rodriguez et al., 2015; Ross-Cowdery et al., 2017; Williams & Smith, 2018).

TPB has widely been used to explain and predict behaviors that one has complete control over (Ajzen, 1991). In fact, TPB was established as an expansion to TRA because TRA did not include the element of perceived behavioral control (Ajzen, 1991). According to TPB, an individual’s behavior is motivated by their intentions and willingness to pursue a desired behavior (Ajzen, 1991). TPB contains four primary constructs that influence behavior: (a) attitude toward behavior, (b) subjective norm, (c) perceived behavioral control, and (d) intention. Accordingly, an individual’s response to behavior is motivated by their attitude, beliefs, subjective norms, and perceived control

(Ajzen, 1991). Ajzen (2011) noted that behavioral, normative, and control beliefs are precursor factors for determining behavior.

Behavioral beliefs describe an individual's expectations of their behavior (Ajzen, 2019). Behavioral beliefs shape the individual's attitude toward the behavior (Ajzen, 2019). Normative beliefs describe the individual's perception of the behavioral expectations of influencers, such as spouses, family, friends, doctors, educators, and coworkers and supervisors (Ajzen, 2019). Control beliefs describe the perception of factors that will aid or hinder the desired behavior (Ajzen, 2019). Control beliefs determine an individual's belief in their ability to perform a behavior or their perceived behavioral control (Ajzen, 2019).

TPB has been useful for predicting health-related behaviors, such as breastfeeding (Ajzen, 1991; Montaño & Kasprzyk, 2015). Moreover, breastfeeding intention can predict breastfeeding behavior, considering the intention to act typically occurs before the action (Guo et al., 2016). According to TPB, behaviors can be explained through knowledge, intention, and perceived behavioral control (Ajzen, 1991). Thus, knowledge and perceived behavioral control enhance the intention to breastfeed, followed by breastfeeding behavior. Proponents of TPB have pointed out that perceived behavioral control and intention may predict breastfeeding behavior (Kim et al., 2017). Ross-Cowdery et al. (2016) used TPB to examine the intentions of pregnant women to breastfeed after receiving counseling on the maternal health benefits of breastfeeding. TPB was useful in revealing that the increased knowledge about the maternal health benefits of breastfeeding improved perceived behavioral control and breastfeeding intentions (Ross-Cowdery et al., 2016). Although Ross-Cowdery et al. (2016) were able to improve breastfeeding intentions through education, they suggested that other factors are involved in sustaining breastfeeding behavior. Thus, based on TPB, an individual's attitude toward the behavior, perceived behavioral control, and intentions are individual and collective determinants of performance of the behavior (Ajzen, 1991).

Zhang et al. (2018) applied TPB to examine which of the four determinants of behavior (knowledge, attitude, subjective norm, and perceived behavioral control) was the most influential at 4 months postpartum and beyond (2018). Zhang et al. (2018) argued that breastfeeding knowledge has the greatest influence on breastfeeding compared to attitude, subjective norm, and perceived behavioral control. Within Zhang et al.'s study, knowledge included health benefits of breastfeeding for both mom and baby, breastfeeding skills, knowledge on breast milk feeding requirements, and storage. The authors ultimately concluded that the greater the knowledge, the greater the likelihood women will breastfeed exclusively (Zhang et al., 2018). Similarly, in the current study, I evaluated the relationship between receiving breastfeeding information and breastfeeding duration among African American women with a family history of breast or ovarian cancer.

Kim et al. (2017) applied all four of the determinants of behavior in a mixed-methods study to identify facilitators, barriers, and needs to increase breastfeeding support among African American participants in Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in Iowa. Kim et al. illustrated how each determinant influenced participants' decisions to breastfeed. Specifically, cultural beliefs and the need to return to work or school affected participants' attitudes and subjective norm toward breastfeeding, while social support from family and others in their social circle affected their perceived behavioral control (Kim et al., 2017). The determinants of behavior will vary across cultural groups (Kim et al., 2017).

Because TPB addresses intentions, attitudes, subjective norms, and perceptions of ability to perform a behavior, the theory is useful for explaining health behaviors (Montaño & Kasprzyk, 2015). For this study, predictions can be made regarding high-risk women who were provided information about breastfeeding and the resulting breastfeeding practice. Therefore, TPB was used to predict if women who are knowledgeable of their family breast and ovarian cancer history and are recipients of breastfeeding information will not only initiate but continue breastfeeding.

Literature Review

AAP (2021) recommends exclusive breastfeeding for the first 6 months of life and continued exclusive breastfeeding as supplemental foods are introduced through the first year of life or longer. Breast milk offers multiple protective factors to the infant and the breastfeeding mother (AAP, 2021). Recognizing the numerous health benefits of breastfeeding, the Healthy People 2020 breastfeeding objectives were established to improve maternal and infant health (U.S. Department of Health & Human Services, 2014). The breastfeeding goals to be reached by 2020 were 81.9% of women would initiate breastfeeding, 60.6% would continue at 6 months of age for the infant, and by 1 year of age, 34.1% of infants would continue to be breastfed (U.S. Department of Health & Human Services, 2014).

On a national level, in 2015, most of the HP2020 targets for breastfeeding were met. According to the 2015 NIS, breastfeeding was initiated at 83%, by the sixth month of infancy, 58% of those infants were still being breastfed, and by 12 months, only 36% continued to breastfeed (CDC, 2018). Additionally, 47% of infants were being exclusively breastfed at 3 months; however, by the sixth month, only 25% continued with exclusive breastfeeding (CDC, 2018). Thus, breastfeeding initiation has increased compared to past years, but evidence shows that women have more difficulty with continuing to breastfeed. Even more, breastfeeding initiation and retention rates among African American women continue to be lower than the rates among other racial groups (Anstey, Chen et al., 2017). For example, between 2011 and 2015, 64% of African American women-initiated breastfeeding compared to 82% of White and Hispanic women (Anstey, Chen et al., 2017). By 6 months postpartum, only 14% of African American women were exclusively breastfeeding, compared to 23% and 18% of White and Hispanic women, respectively (Anstey, Chen et al., 2017). By 12 months postpartum, 17% of African American women reported that they were breastfeeding while supplementing with infant formula, compared to 31% and 26% of White and Hispanic women, respectively (Anstey, Chen et al., 2017).

Poor knowledge, social and cultural norms, perception of poor milk supply, limited family and social support, and lack of support from work and childcare environments are the reported barriers women face with breastfeeding (Anstey, Chen et al., 2017; Louis-Jacques et al. 2017). African American women experience additional barriers that increase the likelihood of them not meeting breastfeeding goals. Combined with the above-mentioned barriers, early return to work, poor breastfeeding education from health care providers, influence of social and cultural myths, lack of professional breastfeeding support, and the lack of normalcy of breastfeeding within the African American community are additional barriers that hinder breastfeeding success for African American women (Anstey, Chen et al., 2017; Louis-Jacques et al. 2017). Considering the significantly higher breast and ovarian cancer mortality rates for African American women, efforts to improve breastfeeding among this group is valuable.

Breastfeeding Education

Current research supports the notion that educational interventions are significant for improving breastfeeding rates. As a result, the 2011 surgeon general's call to support breastfeeding prompted public health leadership to spearhead educational efforts that promote and support breastfeeding (CDC, 2020). The focus of many of the efforts have been to educate women on the health benefits of breastfeeding. Because African American women have the lowest rates of breastfeeding compared to other races, many of these efforts were focused on contributing factors that influence breastfeeding among African American women.

To promote and support breastfeeding for African American women, it is important to assure they are given relevant information about it from multiple sources. Obeng et al. (2015) noted a recurring theme that breastfeeding information was not provided during prenatal or postnatal visits, nor was support from family and friends sufficient for the African American women in their study. In retrospect, the women reported that the lack of discussions about breastfeeding influenced their decision not to breastfeed. However, previous research acknowledged that women are knowledgeable about breastfeeding, but are mostly informed about the infant health benefits of breastfeeding (Ross-Cowdery et al., 2017). In previous years, infant health has become the primary focus in public health interventions (Godfrey & Meyers, 2009). While knowledge of the infant health benefits of breastfeeding is an important focal point for motivating women to breastfeed, consideration to the multiple avenues that play a facilitating role in breastfeeding are equally important.

Zhang et al. (2018) examined breastfeeding knowledge, including—health benefits, skills, feeding requirements, and storage and use, against exclusive breastfeeding and discovered that the greater the knowledge score, the greater the likelihood that exclusive breastfeeding will occur. The authors of the study also determined that knowledge was the greatest determining factor toward exclusive breastfeeding. Contrarily, another study, conducted by Thomson et al. (2017), found that increased breastfeeding knowledge was not enough to encourage breastfeeding. They emphasized the importance of including culturally relevant influencers to encourage African American women to breastfeed. Therefore, breastfeeding education is vital for increasing breastfeeding rates, along with other culturally engaging techniques that will alter the individual and social mindset among many African American women.

Breastfeeding Education Disparities Among African American Women

According to recent findings, breastfeeding education is not as available to African American women during prenatal visits, hospital delivery, or postpartum visits (Anstey, Chen et al., 2017; Comess, 2017; and Louis-Jacques et al., 2017). It was noted that African American women with a lower socioeconomic status are not offered breastfeeding education and the health benefits are not discussed with them by health care providers (Louis-Jacques et al., 2017). In addition, breastfeeding education disparities exist for women with less than a college education (Anstey, Chen et al., 2017; Louis-Jacques et al., 2017; Xiang et al., 2019). Women with less education are less likely to breastfeed (Anstey, Chen et al., 2017; Louis-Jacques et al., 2017; Xiang et al., 2019). The decreased amount breastfeeding education and support primarily occurs within zip codes that have a higher population of African American residents who are likely to possess a low level of education (Anstey, Chen et al., 2017; Louis-Jacques et al., 2017; Xiang et al., 2019).

This phenomenon is not completely understood however several researchers have yielded some important insights into why breastfeeding educational disparities exist for African American women. While it is generally agreed that health care provider prenatal appointments do not accommodate for the amount of time needed to offer detailed breastfeeding education to women and still accomplish other significant tasks related to the health of the mother and child (Williams & Smith, 2018), it remains controversial that health care providers are ill-equipped to assist low-income populations. Some believe that the lack of or poor breastfeeding support for low-income women is a product of a cyclical belief system of lowered expectations for these women and their health care providers (Johnson et al., 2016; Lind et al., 2014).

Another potential contributor to breastfeeding education disparities among low-income women is their participation in the WIC Program. WIC provides supplemental nutrition support, counseling, and resources to millions of low-income families, and is known for being champions of breastfeeding promotion, education, and support (United States Department of Agriculture, 2017). However, WIC provides formula as an option for feeding infants, further confusing some women with their decision to breastfeed (Louis-Jacques et al., 2017). Health care providers and health promotion programs, such as WIC, play a significant role in assuring that women are empowered and educated about breastfeeding.

Cultural norms are also contributors to breastfeeding education disparities within the African American community. Not only do African American women have fewer examples of breastfeeding women in the family (Kim et al., 2017), they also receive misinformation about breastfeeding that may have been passed down for generations. For example, some African American women are often told that breastfeeding will “spoil” the baby, one must eat healthy to breastfeed, or the breasts are solely for sexual pleasure (Kim et al., 2017). The support of family and community extends the chances for breastfeeding success for African American women, yet their influence may propagate cultural myths and taboos about breastfeeding, which discourages breastfeeding in the long-haul (Ganju et al., 2018).

Importance of Breastfeeding Education From Health Care Providers

There is robust literature available concerning the important role of improving breastfeeding rates that health care providers share through their provision of breastfeeding education to women. Many studies suggested that breastfeeding education may influence mothers to breastfeed, and the greater the education, the greater the impact

(Abuidhail et al., 2019). Common breastfeeding education topics health care providers discuss with new or expectant mothers include, preparing for the hospital, infant feeding, breastfeeding benefits for infants and women, latching and positioning, hunger and satiety cues, breastfeeding in public, and returning to work or school (Esselmont et al., 2018; Parry et al., 2017; Stolzer & Hossain, 2014; Webber & Serowoky, 2017). Sousa et al. (2017) clarified that knowledge based breastfeeding interventions may improve breastfeeding knowledge by 20%. These findings suggest the possibility of more women choosing to initiate breastfeeding and continuing to breastfeed as a result of receiving breastfeeding education from their health care provider.

Eastin and Sharma (2015) noted that prenatal breastfeeding education as a pivotal contributing factor for facilitating breastfeeding success. In their study, women who received breastfeeding education and training during their prenatal period were more successful with breastfeeding than women who were not provided training (Eastin & Sharma, 2015), which emphasizes the significance of educational interventions that occur early-on. Reyes et al. (2019) further examined the effectiveness of providing breastfeeding education to teen girls in a secondary educational setting. They acknowledged that breastfeeding education in the secondary setting is an ideal setting to explore, because it allows time for normalizing breastfeeding through the evolution of attitudes, knowledge, and beliefs. The work of Stuebe and Schwarz (2010) demonstrated that it may be beneficial for health providers to present breastfeeding education in the form of risks of formula feeding to promote maternal and child health outcomes of breastfeeding.

Importance of Breastfeeding Education from Breastfeeding Support Services

Williams and Smith (2018) suggested that breastfeeding education provided during prenatal or wellness visits is typically a rushed experience for women. Often, health providers only have a short amount of time during office visits to give a brief message about the benefits of breastfeeding, which highlights the need for detailed education and support from lactation consultants, childbirth educators, or doulas (Williams & Smith, 2018). The review of the literature shows that researchers agree that breastfeeding and lactation support services improve breastfeeding rates for women. William and Smith's (2018) findings build on the work of McGinnis et al. (2018) in that breastfeeding initiation rates increased with home visitor facilitated education and support among the participants in their study. Moreover, McGinnis et al. (2018) noted that breastfeeding duration increased with earlier home visits, and any additional visits beyond 3-months postpartum increased the likelihood of breastfeeding at 6-months by 11%. Based on these findings, breastfeeding education given by specialists that reinforce and expand the work of health care providers are invaluable for encouraging the initiation and continuation of breastfeeding. Their contribution increases in impact when these encounters occur multiple times.

When legislators passed the 2010 Affordable Care Act (ACA) in an attempt to address the socioeconomic barriers of breastfeeding, lactation services were made available to low- income women needing assistance with breastfeeding (Hawkins et al., 2015). As a result of the available data from women who have used those services, the effectiveness of lactation services has been evaluated in recent studies. A literature review conducted by Patel and Patel (2016) on the effectiveness of lactation consultant services to new mothers and infants revealed that lactation interventions significantly improved breastfeeding initiation rates among the participants, as well as showed improvements to breastfeeding exclusivity. Gurley-Calvez et al. (2018) added that a recent 10% increase in breastfeeding duration and 21% increase in duration and exclusivity was brought on by the ACA. Evidence from these studies suggest that there is an existing relationship between the information sharing that takes place between lactation support personnel and breastfeeding outcomes.

Numerous researchers have found that lactation consultations, as a result of the ACA, help improve breastfeeding practices, however, Hawkins et al. (2015) concluded that the ACA is a work in progress, as it is insufficient for improving breastfeeding disparities for low-income women when considering the unique challenges they face with accessing lactation services. This finding is congruent with the work of Flood (2017), who concluded that the ACA mandates may contribute to improved breastfeeding rates on a national level, however, access to lactation consultants and breastfeeding education in rural settings is limited due to budget cuts and staffing furloughs within health care facilities. Although evidence of the effectiveness of lactation services is conflicting, most scholars agree that more research is needed to outline the details of these services and how they may impact breastfeeding behaviors.

Importance of Breastfeeding Education from Family and Friends

The role of family and friends in relation to breastfeeding mothers is most often referred to as the role of support, however it has been noted that family members who lack breastfeeding knowledge are ill-equipped to support breastfeeding mothers (Yazgan et al., 2012). More notably, sociocultural backgrounds have a significant influence on health behaviors among African American women, so much so, that the results in a study conducted by Chen et al. (2012), led them to advocate for educating family, friends, and social influences about breastfeeding. Thus, breastfeeding education given to family and friends may better equip them to promote and support breastfeeding mothers in their communities.

In a similar vein, Obeng et al. (2015) recognized the influence that family and social support have on new mothers. As a result, Obeng et al. (2015) recommended that future studies explore the value of educational courses offered to family and social support for improving breastfeeding rates among African American women. Mothers and grandmothers are significant influencers of breastfeeding. In a recent study, grandmothers reported that their role is to pass along breastfeeding knowledge within their family and the community, even more so than medical professionals (Houghtaling et al., 2018). Increasingly, fathers have been targeted in their role as breastfeeding promoters. A study completed by Tadesse et al. (2018) revealed improved breastfeeding behavior within low to middle income families when fathers, along with health care providers, promoted and supported breastfeeding.

Based on data from the Infant Feeding Practices Survey, Chen et al. (2012) observed a positive relationship between breastfeeding duration and breastfeeding education received from support groups, family, and friends. Conversely, Chen et al. (2012) observed a negative association between breastfeeding duration and breastfeeding education received from physicians. Fabiyi et al. (2016), noted similar findings, especially when comparing African-born women and African American women. While both groups reported being persuaded to breastfeed by family and friends, African-born women reported being more influenced and educated on breastfeeding by their family, partners, in-laws, employers, and culture rather than health care providers. Although health care providers are valuable sources for breastfeeding promotion and support, sociocultural influencers are held in high regard amongst African American women.

Importance of Breastfeeding Education for Reducing Maternal Health Risks

Another component of breastfeeding knowledge includes knowledge of health risks. Breastfeeding may reduce genetic risk factors of certain diseases. For example, numerous studies promote breastfeeding as an incentive for improving maternal health, yet there is limited research on breastfeeding knowledge as it relates to breast and ovarian cancer risk reduction and breastfeeding outcomes. One recent study by Ganju et al. (2018) revealed that of the non breastfeeding mothers in their study, approximately 33%, would have considered breastfeeding if they were knowledgeable about the relationship between breastfeeding and breast cancer risk reduction. However, Alghamdi et al. (2017) challenged the notion that breastfeeding rates improve according to the knowledge received by arguing that knowledge may be a part of the equation, but cultural beliefs and social influencers inhibit and facilitate breastfeeding success. In their study, Thomson et al. (2017) largely confirms Alghamdis' findings.

Similar to Ganju's study, the majority of the women in Meisel et al.'s (2017) study stated that they would engage in health behavior changes if they were knowledgeable of genetic risks. Despite these findings, nearly 35% of the women in this study knew of a family history of breast and ovarian cancers but did not believe they were at risk (Meisel et al., 2017). Moreover, several studies, including, Classen et al. (2010); Spector et al. (2011); Ham et al. (2015); Paalosalo-Harris and Skirton (2016); and Bertoni et al. (2019) complimented the findings of Meisel et al. (2017) by revealing that women may be knowledgeable of a family history of cancer, but still may not participate in preventive behaviors based on their knowledge of their family history. The authors attributed this discovery to the possibility that women are not aware of preventive health behaviors or they are overwhelmed with making a decision on which of the many preventive health behaviors are most effective at preventing the incidence of cancer. These findings suggest the importance of educating women about the connection between family history of breast and ovarian cancers and the genetic risk factors to initiate risk reduction behaviors. Furthermore, it is important to consider the barriers and misperceptions women face in their decision to breastfeed.

Breast Cancer

As with all cancers, breast cancer develops when breast tissue cells begin to reproduce abnormally (Breastcancer.org, 2018). Most commonly, abnormal cell growth in breast tissue typically occur in the lobules, where milk is produced, or the ducts that drain milk from the lobules to the nipple (Breastcancer.org, 2018). In order of severity, growth rate, and prognosis, breast cancer can be characterized into five subtypes—luminal A, normal-like, human epidermal growth factor receptor 2 (HER2), luminal B, and Triple-negative/basal-like (Ambrose et al, 2014; breastcancer.org, 2019). Genetic abnormalities cause breast cancer, whereas 5-10% of breast cancers are inherited and 85-90% occur as a result of genetic mutations that occur due to aging (Breastcancer.org, 2018). In addition to genetic risk factors, breast cancer is also caused by a combination of lifestyle, reproductive, and environmental risk factors.

Breast Cancer in Michigan

In 2013, there were 1,540 new cases of breast cancer in Michigan and 1 out of 10 new mothers reported a family history of breast cancer (Michigan Department of Health and Human Services [MDHHS], 2019). Over a span of four years, the breast cancer mortality rate in Michigan was 23.4 per 100,000 Whites and 33.8 per 100,000 Blacks in 2007 (Akinyemiju et al., 2013). Although the breast cancer mortality rate has declined since 2007, the disparities between Whites and Blacks continue to widen (Akinyemiju et al., 2013). The limited availability and accessibility of health care resources within zip codes where more Blacks reside may explain this widening disparity (Akinyemiju et al., 2013). In light of these findings, inadequate health care resources pose challenges for women to receive education on prevention and behavioral risk factors.

Risk Factors

There are numerous forms of breast cancer and genetic mutations, at which the risk factors are manifested through genetics, the environment, or through histopathologic processes (Sauter, 2018). Genetic risks factors include family and personal history of breast cancer, family history of TNBC, being of the Ashkenazi Jewish heritage, being African American diagnosed with breast cancer at age 35 or younger, having a male family member diagnosed with breast cancer, and knowledge of an abnormal familial breast cancer gene (Breastcancer.org, 2018). Lifestyle risk factors include weight, exercise, smoking, dietary intake, and alcohol consumption (Breastcancer.org, 2018; Sauter, 2018). Reproductive risks factors include age at menarche, parity, breastfeeding history, use of oral contraceptives, and use of hormone therapy (Breastcancer.org, 2018; Sauter, 2018). Environmental risk factors include exposure to diethylstilbestrol, exposure to radiation before age 30, and exposure to chemicals in cosmetics, foods, plastics, sunscreen, water, and lawn products (Breastcancer.org, 2018; Sauter, 2018). Additionally, Sauter (2018) discussed other forms of prevention, such as, chemoprevention and mastectomy.

Triple-Negative Breast Cancer

TNBC makes up 10-20% of breast cancer occurrences (Breastcancer.org, 2018). It is a breast cancer subtype that does not carry receptors for estrogen, progesterone, or the human epidermal growth factor receptor 2 (HER2) protein. When these receptors are absent, abnormal cell growth is encouraged, which makes it difficult for the body to respond to hormone therapy (Breastcancer.org, 2018; Islami et al., 2015). Research suggests that White women are more likely to be diagnosed with breast cancer but African American women are more likely to experience TNBC, a more aggressive form of breast cancer (Breastcancer.org, 2018; Islami et al., 2015). Anstey, Chen et al. (2017) conducted a review on breastfeeding implications for African American mothers for reducing the risk of breast cancer. Several studies showed that African American women were more susceptible to triple negative breast cancer, and it may be anticipated that if breastfeeding rates were increased among Black women, their risk for breast cancer, specifically triple negative breast cancer, would decrease.

Triple-Negative Breast Cancer Characteristics

Researchers have determined that TNBC heavily affects younger women. Sheridan et al. (2014) concluded that TNBC was more common in women less than 40 years of age, at which they have a greater chance of breast cancer relapse and a decreased chance of survival. Guo et al. (2018) supported the work of Sheridan and noted that the breast cancer survival rate is lower among women <40 years of age because screening rates are low among this group. Therefore, a decrease in breast cancer morbidity and mortality rates among this group can be attributed to advancements in cancer treatments (Guo et al., 2018).

There are two mutated anti-tumor genes related to breast cancer (mBRCA). Mutated BRCA 1 and 2 make up the most commonly occurring genes associated with breast cancer with the strongest genetic risk factors (Jones et al., 2017). Triple-negative breast cancer is common in women who carry the mBRCA 1 gene (Gluz et al., 2009; Isalami et al., 2015; Sauter, 2018). Seventy percent of breast cancers that occur due to the mBRCA 1 gene are TNBC (Breastcancer.org, 2018). Thus, TNBC is more common among women with the mBRCA 1 gene. The BRCA 1 gene is important for repairing breaks that occur in double stranded DNA (Gluz et al., 2009). The lack of BRCA 1 signifies the inability to repair damaged DNA and the likelihood for developing TNBC (Gluz et al., 2009). One study identified 11.3% of the 177 participants, less than 50 years of age, with TNBC to have the mBRCA 1 gene (Young et al., 2009).

Breastfeeding and Breast Cancer

Proponents of breast cancer research have identified several lifestyle risk factors related to breast cancer incidence, including breastfeeding. For instance, during the early 20th century, Jane Elizabeth Lane-Claypon, a British medical scientist, was the first to identify the relationship between breast cancer risk reduction and breastfeeding (Lane-Claypon, 1926). Since then, decades of research continually underscore the message that women who breastfeed have a reduced risk of breast cancer, and risk reduction is strengthened with duration.

Stecklein et al. (2017) evaluated 82 women with inflammatory breast cancer and used breastfeeding as a modifier for locoregional recurrence, distant metastasis, disease free survival, and overall survival. Women who breastfed had a lower risk of recurrence, metastasis, and higher chance of disease-free survival. Similarly, Ambrose et al. (2014) found that breastfeeding had no impact on ER+ breast cancer but showed a decrease in TNBC in parous women.

ElShmay (2016) explained protective factors against parity associated breast cancer (PABC), specifically known as estrogen receptor (ER)+/progesterone receptor (PR)+, HER2+, and TNBC. Strong associations for getting such cancers included not becoming pregnant, menopausal hormone therapy, and increased age at first childbirth and early age at menarche. Breastfeeding, on the other hand, showed an inverse relationship with ER+/PR+ but a positive association with TNBC. Elshmay (2016) also concluded that increased duration of breastfeeding offers protective factors against PABCs. This finding is congruent with the work of Ma et al. (2017) who found that breastfeeding duration decreased the risk of TNBC by 31%, especially among young African American women (ages 20-44). Contrary to these findings, the Nurse's Health Study found no relation to breastfeeding duration and breast cancer risk, however, a relationship was found between breast cancer risk and having a first degree relative with breast cancer (Sauter, 2018).

Ovarian Cancer

Ovarian cancer occurs when abnormal cells grow on the ovaries (National Ovarian Cancer Coalition [NOCC], n.d.). Approximately 1 in 78 women are diagnosed with ovarian cancer each year, whereas out of 22,280 newly diagnosed women, 14,240 will succumb to the disease (NOCC, n.d.). Epithelial ovarian cancer is the most common and accounts for 90% of all ovarian cancer diagnoses and is usually diagnosed at stages III and IV (Gaitskell et al., 2018; NOCC, n.d.). Other histocytes, endometroid, clear cell, mucinous, and low-grade serous carcinomas, account for less than 20% of ovarian cancer cases (Gaitskell et al., 2018). By eliminating risk factors, 1/3 to 2/5 of ovarian cancer cases can be reduced (NOCC, n.d.).

Ovarian Cancer in Michigan

In 2013, there were 714 new cases of ovarian cancer among Michigan mothers and 1 out of 12 of those mothers reported a family history of ovarian cancer (MDHHS, 2019). The following year, 514 women died from ovarian cancer (MDHHS, 2019). Between 2016 and 2017, 8 per 100,000 African American women residing in Michigan were diagnosed with ovarian cancer and 5 per 100,000 died from the disease (MDHHS, 2019). Concurrently, 11 per 100,000 White women residing in Michigan were diagnosed with ovarian cancer and 6 per 100,000 died from the disease (MDHHS, 2019). A prediction of 730 new cases of ovarian cancer will occur in 2019 among Michigan mothers (MDHHS, 2019). This evidence brings to light the severity of ovarian cancer incidences among women, yet African American women die at higher rates than White women.

Ovarian Cancer Risk Factors

Various studies suggest that age, socioeconomic status, diet, exercise, caffeine use, and tobacco are factors that increase ovarian cancer risk (Momenimovahed et al., 2019). However, genetic factors, such as ovarian or breast cancer personal and family history, and reproductive factors are the strongest risk factors (Andrews & Mutch, 2017; Momenimovahed et al., 2019; Moorman et al., 2016). The race of a woman may determine morbidity and mortality rates of ovarian cancer. White women have a higher incidence and survival rate of ovarian cancer, while African American, Hispanic, and Asian women have a higher mortality rate (Sopik et al., 2015).

Genetic Risks

First degree relatives of women with ovarian cancer have a three-fold increased risk of being diagnosed with the disease (Jones et al., 2017). Currently, mBRCA 1 and 2, MMR genes, BRIP1, RAD51C, RAD51D, and Common SNPs make up less than 50% of the known genetic components; the majority of the heritable component of ovarian cancer is unknown (Jones et al., 2017). The most common inherited risk for ovarian cancer is BRCA1 and 2 genetic mutations (Jones et al., 2017; Walsh et al., 2011), which accounts for 3% of ovarian cancer risk by age 40 and 10% risk by age 50 (Andrews & Mutch, 2017). However, by the age of 80, ovarian cancer carries a 49% risk for carriers of mBRCA 1 and 21% risk for carriers of mBRCA 2 (Kotsopoulos et al., 2018). Thus, as women age, genetic risk factors become more severe. A bilateral salpingo-oophorectomy is the most common recommendation to treat and prevent uterine carcinoma associated with BRCA 1 and 2 mutations (Jones et al., 2017).

Reproductive Risks

Although epithelial ovarian cancer is primarily diagnosed in postmenopausal women, the reproductive practices between the ages 20-30 influence ovarian cancer risks (Moorman et al., 2016). Reproductive practices that influence ovarian cancer risks includes parity, oral contraceptive use, and breastfeeding (Modugno et al., 2019). These risk factors are not specific to race, current research suggested they have the same impact on both White and African American women (Moorman et al., 2016).

Parity. Numerous scholars have examined the role that parity plays in reducing epithelial ovarian cancer risks. Unlike most studies, Ferris et al. (2014) did not find significant evidence that parity is associated with the reduction of ovarian cancer in high-risk women. However, current studies identified a significant, inverse relationship between parity and ovarian cancer risk (Jones et al., 2017; Malvezzi et al., 2016; Moorman et al., 2016; Momenimovahed et al., 2019). It is believed that recurring ovulation causes damage to the epithelium of the ovaries, thus, suppressed ovulation reduces ovarian cancer risks (Momenimovahed et al., 2019). Therefore, multiparous women have greater protection from ovarian cancer. Andrews and Hutch (2017) noted that older age at childbirth offers increased protection against ovarian cancer.

Considering the age group that is most affected by ovarian cancer, women who experience childbirth at an early age have higher risks of ovarian cancer, compared to women who delayed pregnancy until older age.

Oral Contraception Use. To date, oral contraceptive use and parity are the main lifestyle protective behaviors against ovarian cancer (Jones et al., 2017). Analogous to pregnancy, oral contraception use suppresses ovulation, leading to less epithelial tissue damage in the fallopian tubes (Momenimovahed et al., 2019). La Vecchia and Franceschi (1999) noted that ovarian cancer risk reduction can last for 10-15 years after oral contraceptives are no longer being used. However, risk reduction may be related to the length of time that oral contraceptives are used. Shafrir et al. (2017) found an 82% increase in ovarian cancer with use of oral contraceptives for six-months or less. They also noted a 5% decrease in ovarian cancer risk for every year that oral contraceptives are used (Shafrir et al., 2017). Some researchers equate the increased ovarian cancer mortality among the African American population to their limited use of oral contraception and increased parity at an early age (Moorman et al., 2016).

Breastfeeding. Most of the research on ovarian cancer suggests a reduction of risk with breastfeeding (Luan et al., 2013; Momenimovahed et al., 2019; Moorman et al., 2016; Sung et al., 2016) When breastfeeding suppresses ovulation, it reduces ovarian inflammation caused by monthly ovulation and reduces concentrations of estrogen, which has been shown to increase production of malignant cells (Luan et al., 2013; Momenimovahed et al., 2019). Therefore, most literature on ovarian cancer risk factors support the notion that breastfeeding duration, for each live birth, is significant for reducing ovarian cancer risks.

In an earlier study, Jordan et al. (2012) found an average 70% ovarian cancer risk reduction for women who breastfed at least one child for 18 months or more. Drawing on the work of Jordan et al. (2012), Luan et al. (2013) identified an 8% reduction of ovarian cancer risk for every 5-month increase of breastfeeding. In a more recent study, Momenimovahed et al. (2019) noted a 22% reduction in ovarian cancer risk, with increased risk reduction related to breastfeeding duration. Contrarily, Ferris et al. (2014) claimed no association between breastfeeding and ovarian cancer risk reduction among high-risk women. In a similar vein, Gay et al. (2015) also found no association between breastfeeding and ovarian cancer risk when compared to other reproductive risk factors. The reason for the varying views among scholars is not clearly understood, however, socioeconomic factors and different variations in breastfeeding patterns are likely contributors (Luan et al., 2013; Momenimovahed et al, 2019).

Summary and Transition

Breastfeeding provides a safety net for mothers and babies. In particular, women who initiate breastfeeding are less susceptible to experiencing breast and ovarian cancers. African- American women have lower breastfeeding rates than women of other races, yet they experience higher mortality rates from breast and ovarian cancers. Several studies have examined the association between breastfeeding and breast and ovarian cancers, but no studies have examined the extent to which the receipt of breastfeeding information influences breastfeeding behavior among African American women with a family history of breast and ovarian cancer. This study provided clarification of the contributions made by health care providers, breastfeeding support services, and sociocultural members towards impacting breastfeeding rates for high-risk African American women.

The methodology, population, sampling procedures, and procedures for obtaining access to the secondary data set will be discussed in Chapter 3. Additionally, instrumentation, measures used for each variable, data analysis, threats to validity, and ethical procedures will be explained.

Chapter 3: Research Method

Introduction

The purpose of this study was to determine whether breastfeeding information from health care providers, breastfeeding support services, or family and friends could influence breastfeeding duration among African American women with a family history of breast or ovarian cancer. First, the association between knowledge of family history of breast or ovarian cancer and breastfeeding duration was determined. Second, the association between breastfeeding information from health care providers, breastfeeding support services, or family and friends and breastfeeding duration was considered. Third, the association between knowledge of family history of breast or ovarian cancer and breastfeeding information from health care providers, breastfeeding support services, or family and friends was assessed. Finally, I sought to determine whether breastfeeding information from health care providers, breastfeeding support services, or family and friends and knowledge of family history of breast or ovarian cancer has an impact on breastfeeding duration.

Breastfeeding offers widespread health benefits, including the maternal health benefit of reduced risk for breast and ovarian cancers. African American women have high mortality rates from these cancers and significantly lower rates of breastfeeding compared to women in other racial groups. Women commonly receive breastfeeding information from health care providers, breastfeeding educators or support services, or family and friends. Information received from any or all these sources may facilitate breastfeeding behavior among African American women with a family history of breast or ovarian cancer.

In this study I used secondary data from Michigan state data from the PRAMS surveillance system to assess the relationships between the breastfeeding duration of all African American women who: (a) reported a family history of breast and ovarian cancer and (b) reported they were provided information about breastfeeding by a health care provider, breastfeeding support services, and/or family and friends. This chapter includes a concise discussion of the research design and rationale, methodology, threats to validity, and ethical procedures.

Research Design and Rationale

I used a quantitative study with a cross-sectional, correlational design to assess if there is an association between breastfeeding information provided by health care providers, breastfeeding support services, or family and friends to African American women with a family history of breast or ovarian cancer and breastfeeding duration.

A cross-sectional design was appropriate for this study because I used existing data from the PRAMS surveillance system. Thus, there were no perceived time constraints with obtaining the necessary sample because secondary data are generally time and cost effective (Cheng & Phillips, 2014). Cross-sectional studies are useful for studying relationships and differences among populations during a period; however, they cannot explain the cause of the outcome (Setia, 2016). Although causal relationships among variables cannot be determined with cross-sectional studies, the outcomes may inform the research design of future cohort studies (Setia, 2016). Therefore, use of a cross-sectional design for this study raises the potential of advancing knowledge in planning culturally responsive breastfeeding interventions. A series of one-way ANOVA tests and a logistic regression analysis were conducted to determine if there is an association between the main effects hypotheses.

Variables

The independent variables in this study were (a) breastfeeding information from health care providers, breastfeeding support services, family and friends and (b) knowledge of family history of breast or ovarian cancer. The dependent variable in this study was breastfeeding duration.

Methodology

Population

The target population for this study was African American women who were residents of the state of Michigan with a recent live singleton birth. The state of Michigan has 83 counties and had a population of approximately 10 million residents in 2018 (State of Michigan, 2019; U.S. Census Bureau, n.d.). In 2018, 79% of the Michigan population was White, 14% was Black or African American, and 5% was Hispanic or Latino (U.S. Census Bureau, n.d.). There were 110,093 live births in Michigan in 2018, compared to 3,788,235 births in the United States (DHHS, 2019). Accordingly, 21, 643 of 2018 Michigan births were reported by African American women compared to 234, 870 African American births in the United States (CDC, 2019; MDHHS, 2017).

It was projected that in 2019 there would be 9,310 new cases of breast cancer and 730 new cases of ovarian cancer in Michigan (MDHHS, 2019). Median household income was $52,668, with 14% of the population living below poverty (U.S. Census Bureau, n.d.). Ninety percent of the population of Michigan have a high school diploma or equivalent, and 28% have a bachelor's degree or higher (U.S. Census Bureau, n.d.).

Table 1

Comparison of Sociodemographic Profile of Michigan and the United States

Sociodemographic profile	Michigan	United States
Race and Hispanic origin		
White alone, none Hispanic/Latino	74.9%	60.2%
Black or African American, alone	14.1%	12.3%
Hispanic or Latino	5.2%	18.3%
Median household income	$54,938	$63,179
Families below poverty level	14.1%	11.8%
Education		
High school diploma or equivalent	90.5%	87.7%
Bachelor's degree or higher	28.6%	31.5%

Note. From "U.S. Census Bureau QuickFacts: United States," 2014–2018. Michigan data from "U.S. Census Bureau QuickFacts: Michigan," 2014–2018.

Sampling Procedures

According to the PRAMS sampling procedures, each participating state uses the state's birth certificate file to randomly select women with a recent live birth (CDC, 2021). States follow a standard method for collecting data from participants between 2–4 months postpartum but are given the option to tailor some of the procedures according to the needs of the state (CDC, 2021). Those who are randomly selected will receive a letter in the mail that describes PRAMs and indicates they were selected to participate in a survey (CDC, 2021). Within a few days, the PRAMS questionnaire is mailed to the selected participants (CDC, 2021). Second and third letters are mailed to participants who do not respond after each attempt. Lastly, telephone interviews are pursued for those who do not respond to the mailed surveys (CDC, 2021).

The sampling frame is derived from birth certificates of live-born infants born to mothers who are residents of the state where the infant was born (CDC, 2021). PRAMS exclusion criteria include out-of-state births to residents, in-state births to nonresidents, birth certificates that do not provide the mother's last name, birth certificates processed later than 6 months, multiple gestation infants, adopted infants, and surrogate births (CDC, 2021).

States that participate in PRAMS have sample sizes that range from 1,000–3,400 participants each year (CDC, 2021). To promote adequate representation, samples are stratified to allow for oversampling in underrepresented subpopulations, permitting separate estimates and comparisons across populations of public health interest (Shulman et al., 2018). Thus, states have the option to stratify up to two variables, including birthweight, maternal race and ethnicity, maternal education, maternal age, geographic area, and Medicaid status.

Michigan PRAMS Breastfeeding Data

In 1993, Michigan was among 11 other states when the CDC PRAMS was initiated (CDC, 2021). Michigan's increasing interest in infant morbidity and mortality served as the driving force for initiating PRAMS and continues to this day (MDHHS, 2019). Michigan PRAMS collected 2,0003,600 questionnaires each month in 2012–2014, with a 50-60% response rate (MDHHS, 2019). To assure adequate data for underrepresented populations, Michigan oversamples for low-birthweight infants, African Americans, and those residing in Southeast Michigan, including Calhoun, Kent, and Wayne counties (MDHHS, 2019).

Power Analysis. An a priori power analysis was calculated before data analysis. It was used to determine the sample size (n) needed to assure adequate detection of statistical significance. To determine statistical power, G*Power 3.1 software was used (Faul et al., 2007). According to Cohen (2016), the conventional alpha = 0.05, medium power = 0.25, beta = 0.80 were used, which suggests an estimated sample size of 128 participants for the one-way ANOVA model, 83 participants for the logistic regression model, and 68 participants for the multiple linear regression mediation analysis.

PRAMS Surveillance System

For the PRAMS surveys, each participating state retrieves a random sampling of prospective participants based on the state's birth certificate database. The sample consists of resident postpartum women who gave birth to a live-born infant within the same state of residence (CDC, 2021). Data collection, either by mail or telephone, occurs between 2 and 6 months postpartum (CDC, n.d.c). Before the questionnaires are mailed out, a preletter is sent to introduce the study, explain the purpose, and explain the selection criteria and procedures to the potential participant (CDC, n.d.c). Within 3–7 days, the questionnaires are mailed to the same participants who received the preletter, followed by a reminder letter (CDC, 2021). Every 7–14 days, questionnaire packets are sent to all nonrespondents two additional times, then an attempt to reach the participant by telephone is initiated up to 15 tries (CDC, 2021).

Researchers may gain access to PRAMS data by completing an application and proposal and submitting it to the CDC by the first of the month (CDC, 2021). The application process may take up to 6 weeks (CDC, 2021). The processing time includes the initial proposal approval by CDC PRAMS reviewers (CDC, 2021). Approved proposals are then sent to PRAMS site reviewers for additional approval and, lastly, to the statistician to generate the desired data set (CDC, 2021). Upon completion of the approval process and compilation of statistician results, the data set is emailed to the applicant within 2–4 weeks (CDC, 2021). Michigan PRAMS data may be obtained through the national CDC PRAMS and supplemental data, such as the cancer supplemental questionnaire, may be retrieved by contacting the MI PRAMS coordinator (MDHHS, 2019).

Instrumentation and Operationalization of Constructs

Since the inception of the first PRAMS questionnaire in 1987, revisions have occurred every 3–5 years; the PRAMS questionnaire is currently in its eighth revision (Shulman et al., 2018). The questionnaire consists of core questions used by every state and approximately 200 standard questions that states have the option of including for state-specific monitoring (CDC, 2021). The core questions target attitudes, feelings, experiences, and behaviors regarding preconception care, most recent pregnancy, prenatal care, Medicaid and WIC participation, breastfeeding, cigarette and alcohol usage, health insurance, infant health care, contraception use, postpartum care, and various maternal and infant health indicators (CDC, 2021; Shulman et al., 2018). For a limited time, questions that address emergent topics are added to the core questionnaire as a supplement for states interested in collecting such data (CDC, 2021).

PRAMS data have been used for a variety of studies, including studies that address breastfeeding. Therefore, the PRAMS questionnaire can be useful for determining associations between risk factors and breastfeeding outcomes (Shulman et al., 2018). Moreover, in the current study, I examined the relationship between provided knowledge of the maternal health benefits of breastfeeding and the knowledge of family history of breast and ovarian cancers and breastfeeding behavior. Permission to use the data set in the current study was obtained according to the CDC PRAMS guidelines.

Validity and Reliability

The validity and reliability of a study is enhanced by the rigor and quality of the research tool, implementation of the study, and analysis of the data (Creswell, 2014; Heale & Twycross, 2015). The CDC PRAMS was established in 1987 as a national population-based study on maternal behaviors and experiences (CDC, 2021). To date, 47 states participate in collecting ongoing data from a range of 1,300–3,000 mothers per month between 2–4 months postpartum (CDC, 2021). The PRAMS questionnaire undergoes frequent revisions to assure quality and rigor and includes questions pertaining to emergent issues that impact maternal and infant health (CDC, 2020).

Study Variables

Question 34 of the PRAMS questionnaire, “Before or after your new baby was born, did you receive information about breastfeeding from any of the following sources,” was used to define the independent variables. The sources included were health care provider, breastfeeding support services, and family and friends. Health care providers included general doctor, pediatrician, nurse, midwife, or doula. Breastfeeding support services included lactation specialists, breastfeeding support groups, and breastfeeding hotlines. Family and friends included individuals with a blood relation or within the social circle as reported by the participant. This variable was coded as an ordinal variable and grouped into either health care providers, breastfeeding support services, or family and friends. The variable for RQ2 was coded as a dichotomous variable (0 = no, 1 = yes) (see Table 2).

Supplemental Question HH9, “Have any of your family members listed below who are related to you by blood had ovarian cancer,” Supplemental Question HH10, “Have any of your other family members who are related to you by blood had ovarian cancer,” Supplemental Question HH11, “Have any of your family members listed below who are related to you by blood had breast cancer,” and Supplemental Question HH12, “Have any of your other family members who are related to you by blood had breast cancer,” were used to define the independent variable, knowledge of family history of breast or ovarian cancer. Responses from first-degree relatives, including mom, sister, dad, and brother, were extracted from the data set and coded as a dichotomous categorical variable (0 = no, 1 = yes) (see Table 2).

The dependent variable, breastfeeding duration, was defined by Question 37, “how many weeks or months did you breastfeed or feed pumped milk to your baby?” Question 37 was coded as a scale variable and represented length of time in weeks (see Table 2).

Table 2

Operational Definitions

Name of variable	Variable coding	Recoded variables	Description	Level of measurement
Dependent variable				
Breastfeeding duration	BF5LNGTH_RAW		0 = 0 weeks 1 = 1 week 2 = 2 weeks 3 = 3 weeks 4 = 4 weeks 5 = 5 weeks 6 = 6 weeks 7 = 7 weeks 8 = 8 weeks 9 = 9 weeks 10 = 10 weeks 11 = 11 weeks 12 =12 weeks 13 = 13 weeks 14 = 14 weeks 15 = 15 weeks 16 = 16 weeks 18 = 18 weeks	Scale
Independent variables				
Knowledge of family history of breast or ovarian cancer	OVCNCR_MOM OVCNCR_SIS BRCNCR_MOM BRCNCR_SIS BRCNCR_BRO BRCNCR_DAD	Knowledge_of_Fam_Hx	0 = No 1 = Yes	Dichotomous
Breastfeeding information received from health care providers, breastfeeding support services, and family and friends	BFINF_DR_RAW BFINF_NUR_RAW BFINF_SPC_RAW BFINF_BDR_RAW BFINF_GRP_RAW BFINF_HOT_RAW BFINF_FAM_RAW	Total_BF_Info_Received	0 = No 1 = Yes	Dichotomous

Data Analysis Plan

A mediation analysis was used to determine if breastfeeding information received from health care providers, breastfeeding support services, or family and friends mediate the relationship between knowledge of family history of breast or ovarian cancer and breastfeeding duration. Mediation occurs when an intermediate causal relationship exists between the independent variable and dependent variable, such that X_1 causes X_2, and X_2 causes Y (Baron & Kenny, 1986).

There are four steps that accompany mediation analyses (Baron & Kenny, 1986, Statistics Solutions, 2013). The first step included knowledge of family history of breast or ovarian cancer as a predictor of breastfeeding duration. The second step included knowledge of family history of breast or ovarian cancer as a predictor of breastfeeding information received from health care providers, breastfeeding support services, or family and friends. The third step included breastfeeding information received from health care providers, breastfeeding support services, or family and friends, as a predictor of breastfeeding duration. The last step included an analysis to determine if breastfeeding information received from health care providers, breastfeeding support services, or family and friends mediate the relationship between knowledge of family history of breast or ovarian cancer and breastfeeding duration. If all four conditions are met, full mediation is supported. If only the first three conditions are met, partial mediation is supported.

Statistical analyses were achieved using IBM SPSS 27.0. A one-way ANOVA was conducted to examine the associations between the main effects hypotheses for each research question, except that a logistic regression analysis was conducted to determine associations for research question two and The Hayes PROCESS feature in SPSS 27 was used to examine mediation for research question four. It involves a multiple linear regression approach to mediation (Hayes, 2017).

The one-way ANOVA analysis was used to examine the associations between a dichotomous independent variable with two levels and one scale dependent variable (Warner, 2013). The assumptions for ANOVA include normal distribution of variables in each group, homogeneity of variances, and independence of observations (Warner, 2013). Prior to conducting the analyses for each research questions, the assumptions were examined.

The binary logistic regression analysis was used for research question two, in an effort to examine the association between the dichotomous independent and dependent variables. The assumptions for logistic regression include independence of scores on the outcome variable, all relevant predictors must be specified, and the categories on the outcome variable must be exhaustive and exclusive (Warner, 2013). These assumptions were examined prior to conducting the analysis.

A multiple linear regression analysis was used to examine the associations between knowledge of family history of breast or ovarian cancer and breastfeeding duration and whether breastfeeding information received from health care providers, breastfeeding support services, or family and friends mediate the outcome of these relationships. Linear regression analyses assume that the relationship between independent and dependent variables is linear, whereas the independent variable may be quantitative or dichotomous and the dependent variable may be quantitative (Warner, 2013). Thus, a linear regression analysis is an appropriate statistical test for examining relationships with scale dependent variables. A multiple regression analysis is appropriate for this study because this type of analysis is commonly used when there are more than one independent variables, for which mediating relationships may be evaluated (Warner, 2013).

Descriptive statistics and statistical significance were obtained. The alpha level was set to alpha (α) = .05 and the beta (β) slope coefficient was set to 95% confidence interval (CI).

Research Questions and Hypotheses

The research questions and hypotheses are as follows:

RQ1: Is there an association between knowledge of family history of breast or ovarian cancer and breastfeeding duration?

$H_0 1$: Knowledge of family history of breast or ovarian cancer is not associated with breastfeeding duration.

$H_A 1$: Knowledge of family history of breast or ovarian cancer is associated with breastfeeding duration.

DV: breastfeeding duration (scale)

IV: knowledge of family history of breast or ovarian cancer (dichotomous: Y/N)

Test statistic: One-way ANOVA

RQ2: Is there an association between knowledge of family history of breast or ovarian cancer and breastfeeding information received from health care providers, breastfeeding support services, or family and friends?

$H_0 2$: Knowledge of family history of breast or ovarian cancer is not associated with breastfeeding information received from health care providers, breastfeeding support services, or family and friends.

H_A2: Knowledge of family history of breast or ovarian cancer is associated with breastfeeding information received from health care providers, breastfeeding support services, or family and friends.

DV: Breastfeeding information received from health care providers, breastfeeding support services, or family and friends (dichotomous: Y/N)

IV: knowledge of family history of breast or ovarian cancer (dichotomous: Y/N)

Test statistic: logistic regression

RQ3: Is there an association between breastfeeding information received from health care providers, breastfeeding support services, or family and friends and breastfeeding duration?

H_03: Breastfeeding information received from health care providers, breastfeeding support services, or family and friends is not associated with breastfeeding duration.

H_A3: Breastfeeding information received from health care providers, breastfeeding support services, or family and friends is associated with breastfeeding duration.

DV: breastfeeding duration (scale)

IV: Breastfeeding information received from health care providers, breastfeeding support services, or family and friends (dichotomous: Y/N)

Test statistic: One-way ANOVA

RQ4: Does receiving breastfeeding information from health care providers, breastfeeding support services, or family and friends mediate the relationship between knowledge of family history of breast or ovarian cancer and breastfeeding duration?

$H_0$4: Receiving breastfeeding information from health care providers, breastfeeding support services, or family and friends does not mediate the relationship between knowledge of family history of breast or ovarian cancer and breastfeeding duration.

H_A4: Receiving breastfeeding information from health care providers, breastfeeding support services, or family and friends does mediate the relationship between knowledge of family history of breast or ovarian cancer and breastfeeding duration.

DV: breastfeeding duration (scale)

IV: Breastfeeding information received from health care providers, breastfeeding support services, or family and friends (dichotomous: Y/N)

IV: Knowledge of family history of breast or ovarian cancer (dichotomous: Y/N)

Test statistic: Multiple linear regression using Hayes (2017) PROCESS software

Threats to Validity

The CDC PRAMS was first adapted as a national population-based study in 1987. Currently, 47 states participate in conducting ongoing research on maternal behavior and experiences (CDC, 2021). PRAMS data is the source of numerous research studies and has been determined to be a valid and reliable tool for use in the United States and other countries (O’Keeffe et al., 2013). Validity assures the quality and accuracy of the research findings (Stewart & Hitchcock, 2016). Validity is mainly challenged externally and internally (Creswell, 2014).

External

External validity has to do with the generalizability of the study results across a variety of settings (Stewart & Hitchcock, 2016). Accordingly, if the same results can be reached in a variety of populations and settings, then it has high external validity. The present study includes data pertaining to African American women from the state of Michigan, therefore applying the findings to past or future settings, states, or racial ethnic groups should be done with discretion.

Internal

Internal validity assures that the independent variable influenced the dependent variable, considering the presence of other variables that have the potential to influence the dependent variable (Stewart & Hitchcock, 2016). Recall bias may affect internal validity during PRAMS data collection. Surveys are taken within 2-4 months after birth, which is a period of time that new mothers face challenges of adjusting to their new way of life, returning to work, or dealing with other pressures in life. Thus, participants may be challenged with remembering details about events before, during, and after pregnancy. Consequently, participants may not report details accurately, or may report details based on social desirability (Creswell, 2014).

To mitigate internal threats to validity, large sample sizes are targeted (CDC, 2021). The CDC PRAMS data is retrieved through a standardized protocol followed by all participating states, at which they incorporate stratified random sampling, which decreases internal validity (Campbell & Stanley, 1963; CDC, 2021; Stewart & Hitchcock, 2016).

Ethical Procedures

The PRAMS methodology and protocol has to undergo approval by the CDC Institutional Review Board (IRB) and the individual state's IRB (Shulman et al., 2018). Participants are given an informed consent which outlines their rights as a study participant (Shulman et al, 2018). Participants give consent to participate in the study by completing a questionnaire (Shulman et al., 2018).

The study proposal was submitted to the Walden University's IRB committee for approval. I completed and signed the CDC PRAMS data sharing agreement to assure confidentiality and ethical practices. As requested by the CDC, all copies of the data were destroyed once data analysis was complete.

Summary

In Chapter 3, details of the study design and methodology were discussed pertaining to the mediation affect that breastfeeding information received from health care providers, breastfeeding support services, or family and friends and knowledge of family history of breast or ovarian cancer have with breastfeeding duration among African American women in the state of Michigan. A cross-sectional design was used, and data were obtained from the CDC PRAMS.

Chapter 4 will include the results of the ANOVA and logistic regression analyses, which were used to examine the relationship between knowledge of family history of breast or ovarian cancer and breastfeeding duration, while adding a third variable, breastfeeding information received from pertinent sources.

Chapter 4: Results

Introduction

The purpose of this study was to determine whether breastfeeding information from health care providers, breastfeeding support services, or family and friends could influence breastfeeding duration among African American women with a family history of breast or ovarian cancer. Secondary data from the 2018 Michigan PRAMS data set were analyzed to assess the relationships between breastfeeding duration of all African American women who (a) reported a family history of breast or ovarian cancer and (b) reported they were provided information about breastfeeding by a health care provider, breastfeeding support service, or family and friends.

Four research questions were developed according to the Baron and Kenny approach for mediation analyses. Thus, a one-way ANOVA and a logistic regression were used to address each corresponding research question. The Hayes (2017) PROCESS statistical package was used to determine mediation. All established assumptions regarding use of one-way ANOVA and logistic regression were met. Chapter 4 contains an overview of data collection, descriptive statistics, and data analyses that coincides with each research question.

Research Questions and Hypotheses

RQ1: Is there an association between knowledge of family history of breast or ovarian cancer and breastfeeding duration?

$H_0$1: Knowledge of family history of breast or ovarian cancer is not associated with breastfeeding duration.

H_A1: Knowledge of family history of breast or ovarian cancer is associated with breastfeeding duration.

RQ2: Is there an association between knowledge of family history of breast or ovarian cancer and breastfeeding information received from health care providers, breastfeeding support services, or family and friends?

H_02: Knowledge of family history of breast or ovarian cancer is not associated with breastfeeding information received from health care providers, breastfeeding support services, or family and friends.

H_A2: Knowledge of family history of breast or ovarian cancer is associated with breastfeeding information received from health care providers, breastfeeding support services, or family and friends.

RQ3: Is there an association between breastfeeding information received from health care providers, breastfeeding support services, or family and friends and breastfeeding duration?

H_03: Breastfeeding information received from health care providers, breastfeeding support services, or family and friends is not associated with breastfeeding duration.

H_A3: Breastfeeding information received from health care providers, breastfeeding support services, or family and friends is associated with breastfeeding duration.

RQ4: Does receiving breastfeeding information from health care providers, breastfeeding support services, or family and friends mediate the relationship between knowledge of family history of breast or ovarian cancer and breastfeeding duration?

$H_0$4: Receiving breastfeeding information from health care providers, breastfeeding support services, or family and friends does not mediate the relationship between knowledge of family history of breast or ovarian cancer and breastfeeding duration.

H_A4: Receiving breastfeeding information from health care providers, breastfeeding support services, or family and friends does mediate the relationship between knowledge of family history of breast or ovarian cancer and breastfeeding duration.

Data Collection

The CDC PRAMS provided the data for this study once the proposal application and data sharing agreement were approved by the PRAMS committee. In addition, approval for this study was obtained through the Walden University Institutional Review Board. The 2018 Michigan PRAMS data were received via an email zip file and stored on a password-protected laptop. Once the data analyses were completed, all copies of the data set were destroyed according to the CDC PRAMS Data Sharing Agreement.

Data cleaning measures were conducted to include the variables of interest by referring to the CDC Codebook, PRAMS Research Data set Codebook, and the Cancer Supplement Codebook provided by CDC PRAMS. The desired variables were located in the data set and the unwanted variables were deleted. The data set included Colorado, Michigan, New Jersey, and Utah. There were 5,346 total participants in the data set. Additional data cleaning steps were applied to incorporate the variables needed for the analyses.

This study was limited to Michigan based on their higher population of African Americans. In 2018, 13.8% of the population in Michigan was African American, 13.5% was African American in New Jersey, 4.1% of Colorado was African American, and 1.2% was African American in Utah (U.S. Census Bureau, n.d.a). These numbers coincide with PRAMS participation in 2018. Out of 5,346 total participants, Michigan contributed to 35% of the data set while the other three states contributed between 20.8–22.8%. However, Utah provided the most African American participants. Out of 3,458 African American participants, Utah provided 30%, followed by Colorado at 28.3%, Michigan at 24.5%, and New Jersey at 17.2%.

Once the variables of interest were located within the data set, 1,816 samples were used to gather preliminary descriptive statistics for the Michigan PRAMS data set (Table 3). Of the 1,816 samples, those who were not African American (1,024) were excluded from the data set. Thus, 792 relevant samples were used for this study and were weighted according to PRAMS complex sampling guidelines. Additionally, two variables were transformed to accommodate the requirements of each research question. The variables that addressed knowledge of family history of breast or ovarian cancer for first-degree relatives were transformed into one dichotomous variable. The variables that corresponded with breastfeeding information received from health care providers, breastfeeding support services, and family and friends were also transformed into one dichotomous variable.

Descriptive Statistics

Michigan PRAMS reported a 53.7% unweighted and 58% weighted response rate and a total of 1,816 (unweighted) and 106,645 (weighted) participants with a live birth in 2018 (MDHHS, 2020). The CDC PRAMS allows states the option to oversample populations of interest to promote adequate representation (Shulman et al., 2018). In 2018, Michigan oversampled to assure adequate data for addressing health disparities in Michigan. These special populations included African American mothers, mothers who bore a low-birthweight infant, and mothers who resided in seven southeast Michigan counties (MDHHS, 2020). To account for the PRAMS stratified sampling design, a complex samples data set was created in SPSS using the guidelines provided in the PRAMS complex sampling data set instructions. The variables included in the analyses for each research question were sample weight (WTANAL), nonresponse adjustments (TOTCNT), and noncoverage adjustments (TOTCNT) for the sampling frame (SUD_NEST). Table 3 provides a summary of demographic characteristics of the data set. Table 4 provides descriptive statistics including minimum and maximum values, mean, and standard deviation. Table 5 details Pearson's correlation including two-tailed significance tests. Tables 6 provide weighted and unweighted frequencies for the complex sampling for each of the study variables.

Sociodemographic Characteristics

Of the participants selected in the study, 68.1% were White, 18.3% were Black, and 13.6% were Asian or another race. Of the sample, most of the participants, 31.8%, were 25–29 years old, followed by 31.2% of participants who were 30–34 years of age. Most of the participants, 34.3%, reported having a college degree, followed by 29.5% having some college, 26.3% having a high school diploma or GED, and 10% having less than a high school diploma.

Breastfeeding Behavior

Of the sample population, 87.2% of the participants initiated breastfeeding and 12.8% did not try to breastfeed. Of the participants who initiated breastfeeding, 14.2% continued to breastfeed for 1 week, and at 2 weeks, breastfeeding duration peaked at 21.4% and gradually decreased for the following weeks (Tables 3 and 4).

Breastfeeding Information Received

A single variable was created to combine responses based on breastfeeding information received from health care providers, breastfeeding support services, and family and friends. Of the sample, 96.4% reported that they received breastfeeding information from one or more of these categories, while 3.6% reported that they did not receive information about breastfeeding from any source (Table 6).

Knowledge of Family History of Breast or Ovarian Cancer

A single variable was created to combine responses for the cancer supplement questions that addressed family history of breast and ovarian cancers. The variables that included first-degree family members were transformed into one variable called *knowledge of family history of breast or ovarian cancer*. Of the sample, 8.3% reported having a first-degree family member with a history of breast or ovarian cancer, and 91.7% reported not having a first-degree family member with a history of breast or ovarian cancer (Table 6).

Table 3

Summary of Demographic Data, Weighted and Unweighted Frequency and Percent

Variable	Unweighted frequency	Weighted frequency	Percent (Weighted %)
Maternal race			
White	141	72,317	7.8 (68.1)
Black	792	19,443	43.6 (18.3)
Other or Asian	882	14,463	48.6 (13.6)
Missing	1		0.1
Maternal age (years)			
18–19	71	3,254	3.9 (3.1)
20–24	385	19,654	21.2 (18.4)
25–29	598	33,951	32.9 (31.8)
30–34	534	33,310	29.4 (31.2)
35–39	207	12,747	11.4 (12)
40+	49	2,485	2.7
Maternal education (years)			
0–8	2	104	0.1 (.1)
9–11	196	10,439	10.8 (9.9)
12	531	27,649	29.2 (26.3)
13–15	574	31,018	31.6 (29.5)
16≥	499	36,088	27.5 (34.3)
Missing	14		0.8
Breastfeed ever (initiation)			
No	304	13,608	16.7 (12.8)
Yes	1,463	92,392	80.6 (87.2)
Missing	49		2.7

Table 4

Descriptive Statistics for Outcome and Predictor Variables

	Min.	Max.	Mean	*SD*
Breastfeeding duration	0	18	2.93	2.673
Breastfeeding information received	0	1	0.97	0.174
Knowledge of family hx of breast or OVCA	0	1	0.07	0.257

Note. OVCA = Ovarian cancer; hx = history

Table 5

Pearson's Correlation

		Breastfeeding duration	Breastfeeding information received	Knowledge of family history of breast or OVCA
Breastfeeding duration	Pearson correlation	1	-0.021	0.055
	Sig. (2-tailed)		0.576	0.176
	N	752	710	609
Breastfeeding information received	Pearson correlation	-0.021	1	0.017
	Sig. (2-tailed)	0.576		0.531
	N	710	1701	1360
Knowledge of family history of breast or OVCA	Pearson correlation	0.055	0.017	1
	Sig. (2-tailed)	0.176	0.531	
	N	609	1360	1468

Note. OVCA = ovarian cancer

Table 6

Weighted and Unweighted Frequencies and Percentages for Outcome and Predictor Variables

Variables	Weighted count (%)	Unweighted count (%)
Breastfeeding duration (weeks)		
0	5237.498 (13.4)	114 (15.6)
1	5531.650 (14.2)	96 (12.8)
2	8345.984 (21.4)	182 (24.2)
3	7690.324 (19.7)	152 (20.2)
4	5134.070 (13.2)	86 (11.4)
5	1283.142 (3.3)	21 (2.8)
6	2386.205 (6.1)	37 (4.9)
7	933.445 (2.4)	13 (1.7)
8	1211.512 (3.1)	20 (2.7)
9	66.623 (.17)	3 (.4)
10	362.506 (.93)	12 (1.6)
11	277.297 (.71)	4 (.53)
12	231.710 (.59)	3 (.4)
13	88.049 (.23)	1 (.13)
14	138.337 (.35)	3 (.4)
15	41.030 (.11)	2 (.27)
16	30.059 (.08)	1 (.13)
18	57.885 (.15)	2 (.27)
Total	39047.324	752
Knowledge of family history of breast or OVCA		
No	77155.136 (91.7)	1477.294 (107.6)
Yes	6950.075 (8.3)	807.734 (58.8)
Total	84105.212	1373.331
Breastfeeding information received		
No	3502.684 (3.6)	53 (3.1)
Yes	94162.517 (96.4)	1648 (96.88)
Total	97665.201	1701

Results

The analysis for each research question includes results that include all maternal races (n = 1816) and a separate analysis was conducted that included only the African American women (n = 792) from the data set. All statistical assumptions were met for the analyses.

Research Question 1

To investigate RQ1 (Is there an association between knowledge of family history of breast or ovarian cancer and breastfeeding duration), a one-way ANOVA was conducted. The predictor was *knowledge of family history of breast or ovarian cancer* and the outcome was *breastfeeding duration*. The results from the ANOVA analysis were found not to be statistically significant [F (1, 607) = 1.838, $p > .05$]. The results that included only the African American cases were also found not to be statistically significant [F (1, 233) = .415, $p > .05$]. Therefore, the null hypothesis, Knowledge of family history of breast or ovarian cancer is not associated with breastfeeding duration, is retained and the alternative hypothesis is rejected. Table 7 provides a summary of these findings.

Table 7

Association Between Knowledge of Family History of Breast or Ovarian Cancer and Breastfeeding Duration, Using ANOVA

All cases	Sum of squares	*df*	Mean square	*F*	Sig.
Between groups	13.523	1	13.523	1.838	0.176
Within groups	4467.278	607	7.360		
Total	4480.801	608			
African American cases, only					
Between groups	3.296	1	3.296	.415	.520
Within groups	1850.959	233	7.944		
Total	1854.255	234			

Research Question 2

To investigate research question 2, *Is there is an association between knowledge of family history of breast or ovarian cancer and breastfeeding information received from health care providers, breastfeeding support services, and family and friends?* a binary logistic regression was conducted. The predictor was *Knowledge of family history of breast or ovarian cancer* and the outcome was *Breastfeeding information received from health care providers, breastfeeding support services, and family and friends*. The results indicate a positive association; however, it is not significant [B = .455, 95% C.I. (.375, 6.615), $p > .05$]. The results that included only the African American cases also indicate a negative association, but was found not to be statistically significant [B = -1.223, 95% C.I. (.060, 1.439), $p > .05$]. Therefore, the null hypothesis, Knowledge of family history of breast or ovarian cancer is not associated with breastfeeding information received from health care providers, breastfeeding support services, and family and friends, is retained and the alternative hypothesis is rejected. Table 8 provides a summary of these findings.

Table 8

Association Between Knowledge of Family History of Breast or Ovarian Cancer and Breastfeeding Information Received, Using Logistic Regression

All cases	B	*SE*	Wald	*df*	Sig.	Exp(B)	95% CI LL UL
Knowledge of family hx of breast or OV CA	0.455	0.732	0.386	1	0.535	1.576	0.375 6.615
Constant	3.395	0.159	457.371	1	0.000	29.829	
African American cases, only	-1.223	0.810	2.283	1	0.131	0.294	0.060 1.439
Constant	3.708	0.337	120.790	1	0.000	40.778	

Note. CI = confidence interval; LL = lower limit; UL = upper limit; p <.05; hx = history; OVCA = ovarian cancer; Dependent variable: breastfeeding information received from health care providers, breastfeeding support services, and family and friends

Research Question 3

To investigate research question 3, *Is there is an association between breastfeeding information received from health care providers, breastfeeding support services, and family and friends and breastfeeding duration?* a one-way ANOVA was conducted. The predictor was *Breastfeeding information received from health care providers, breastfeeding support services, and family and friends* and the outcome was *Breastfeeding duration*. The results from the ANOVA analysis were found not to be statistically significant [F (1, 708) = 0.313, $p > .05$]. The results that included only the African American cases were also found not to be statistically significant [F (1, 284) = .189, $p > .05$]. Therefore, the null hypothesis, Breastfeeding information received from health care providers, breastfeeding support services, and family and friends is not associated with breastfeeding duration, is retained and the alternative hypothesis is rejected. Table 9 provides a summary of these findings.

Table 9

Association Between Breastfeeding Information Received and Breastfeeding Duration, Using ANOVA

All cases	Sum of squares	*df*	Mean square	*F*	Sig.
Between groups	2.258	1	2.258	0.313	0.576
Within groups	5113.501	708	7.222		
Total	5115.759	709			
African American cases, only					
Between groups	1.518	1	1.518	.189	0.664
Within groups	2282.258	284	8.036		
Total	2283.776	285			

Research Question 4

To investigate research question 4, *Does receiving breastfeeding information from health care providers, breastfeeding support services, and family and friends mediate the relationship between knowledge of family history of breast or ovarian cancer and breastfeeding duration?*, a mediation analysis was performed using the Hayes (2017) PROCESS analysis. The outcome variable for the analysis was *Breastfeeding duration*. The predictor variable for the analysis was *Knowledge of family history of breast or* *ovarian cancer*. The mediator variable for the analysis was *Breastfeeding information received from health care providers, breastfeeding support services, and family and friends*. The direct effect of *Breastfeeding information received from health care providers, breastfeeding support services, and family and friends* was found not to be statistically significant [$t = 1.3922$, $p > .05$]. The results for the African American cases were also found not to be statistically significant [$t = 1.2633$, $p > .05$]. The indirect effect of *Knowledge of family history of breast or ovarian cancer on Breastfeeding duration* was found not to be statistically significant based on the lower and upper bound confidence intervals [-.0733, .0353], whereas one does not fall within the range. The results for the African American cases were also found not to be statistically significant based on the lower and upper bound confidence intervals [-.0554, .0366]. Therefore, the null hypothesis, Breastfeeding information received from health care providers, breastfeeding support services, and family and friends does not mediate the relationship between knowledge of family history of breast or ovarian cancer and breastfeeding duration, is retained and the alternative hypothesis is rejected. As a result of both results above, a mediation effect does not exist between the variables. Tables 10 and 11 provide a summary of these findings.

Table 10

Mediation Analysis, Direct Effect of (X on Y) Breastfeeding Information Received from Health Care Providers, Breastfeeding Support Services, and Family and Friends on Breastfeeding Duration

All cases				
				95% CI
Effect	*SE*	*t*	*p*	LL UL
.6155	.4418	-.493	.1641	-.2522 1.4832
African American cases, only				
				95% CI
Effect	*SE*	*t*	*p*	LL UL
.5518	.4368	1.2633	.2070	-.3061 1.4096

Note. CI = confidence interval; LL = lower limit; UL = upper limit; p <.05;

Table 11

Mediation Analysis, Indirect Effect of (X on Y) Breastfeeding Information Received from Health Care Providers, Breastfeeding Support Services, and Family and Friends on Breastfeeding Duration

All cases		
		95% CI
Effect	Boot*SE*	LL UL
-.0094	.0255	-.0733 .0353
African American cases, only		
		95% CI
Effect	Boot*SE*	LL UL
-.0040	.0216	-.0554 .0366

Summary

Taken altogether, the results of the analyses yielded no statistically significant relationships between knowledge of family history of breast or ovarian cancer, breastfeeding information received from health care providers, breastfeeding support services, and family and friends, and breastfeeding duration. These results were consistent for women of all races within this study. The Baron and Kenny approach for mediation analyses guided the organization of the research questions and statistical analyses. A one-way ANOVA was conducted on research questions 1and 3 and a binary logistic regression analysis was conducted on research question 2. The Hayes (2017) PROCESS analysis was used for research question 4 to determine a direct mediation effect, while using a bootstrapped confidence interval to determine the indirect mediation effect of breastfeeding information received from health care providers, breastfeeding support services and family and friends had on breastfeeding duration.

Research question 1, Is there an association between knowledge of family history of breast or ovarian cancer and breastfeeding duration?, revealed no statistically significant relationship [F (1, 607) = 1.838, $p > .05$] between the variables for women of all races. Similar results were obtained when the analysis was run for African American cases only [F (1, 233) = .415, $p > .05$]. Likewise, research question 2, Is there an association between knowledge of family history of breast or ovarian cancer and breastfeeding information received from health care providers, breastfeeding support services, and family and friends?, revealed no statistically significant relationship [B = .455, 95% C.I. (.375, 6.615), $p > .05$] between the variables, and similar results were obtained when the analysis was run for African American cases only [B = -.083, 95% C.I. (.208, 4.070), $p > .05$]. Similarly, research question 3, Is there an association between breastfeeding information received from health care providers, breastfeeding support services, and family and friends and breastfeeding duration?, revealed no statistically significant relationship [F (1, 708) = 0.313, $p > .05$] between the variables. When the analysis was conducted for the African American cases, the results revealed no statistically significant relationship [F (1, 284) = .189, $p > .05$] between the variables. Lastly, research question 4, Does receiving breastfeeding information from health care providers, breastfeeding support services, and family and friends mediate the relationship between knowledge of family history of breast or ovarian cancer and breastfeeding duration?, revealed no statistically significant direct relationship [$t = 1.3922$, $p > .05$] or indirect relationship [-.0733, .0353] between the variables. Correspondingly, the direct mediation effect with regards to African American cases were found not to be statistically significant [$t = 1.2633$, $p > .05$], in addition to the indirect mediation effect [-.0554, .0366]. An interpretation of the findings will be provided in Chapter 5, including limitations of the study, recommendations for future research, and social change implications.

Chapter 5: Discussion

Introduction

The purpose of this study was to determine whether breastfeeding information from health care providers, breastfeeding support services, or family and friends could influence breastfeeding duration among African American women with a family history of breast or ovarian cancer. Breastfeeding offers breast and ovarian cancer risk reduction, which is improved with breastfeeding duration (Anstey, Shoemaker et al., 2017; Ma et al, 2017; Ross-Cowdery et al., 2017). African American women breastfeed the least compared to women from other racial groups, yet African American women experience the highest breast and ovarian cancer mortality rates (Anstey, Shoemaker et al., 2017; Ross-Cowdery et al., 2017). In this study, I sought to examine whether exposure to information about the connection between breastfeeding and breast and ovarian cancer risk reduction would influence breastfeeding duration among women with a family history of these cancers. The nature of this study was a quantitative cross-sectional secondary analysis. The 2018 Michigan PRAMS data set was used to assess these variables. Michigan is one of four states that collect PRAMS data on family history of cancer. Michigan was selected for its larger population of African Americans compared to the other states.

Summary of Findings

One-way ANOVA tests and logistic regression analysis were conducted to determine if there is an association between the main effects hypotheses, followed by a mediation analysis. Overall, the results of the study yielded no statistically significant association between the variables. An omnibus analysis was run for all maternal race categories for each research question, followed by a subsequent analysis that included only the African American women. For RQ1, a one-way ANOVA was conducted to investigate if an association existed between knowledge of family history of breast or ovarian cancer and breastfeeding duration; there was no statistically significant association found. For RQ2, a logistic regression analysis was conducted to investigate if an association existed between knowledge of family history of breast or ovarian cancer and breastfeeding information received from health care providers, breastfeeding support services, and family and friends; there was no statistically significant association found. For RQ3, a one-way ANOVA was conducted to investigate if an association existed between breastfeeding information received from health care providers, breastfeeding support services, and family and friends and breastfeeding duration; there was no statistically significant association found. For RQ4, a multiple linear regression analysis based on the Hayes (2017) PROCESS analysis was conducted to investigate if receiving breastfeeding information from health care providers, breastfeeding support services, and family and friends mediate the relationship between knowledge of family history of breast or ovarian cancer and breastfeeding duration. I found no statistically significant direct or indirect association between the variables; therefore, a mediation relationship does not exist.

Interpretation of Findings

African American women made up 18.3% of the sample population and contributed the lowest breastfeeding initiation and duration numbers compared to the other racial groups. As in previous studies, the results of this study confirm that race influences breastfeeding behavior. While the African American women in this study initiated breastfeeding at 74.4% (MDHHS, 2019), which is lower than the HP2020 goal of 81.9% for breastfeeding initiation (HHS, 2014), and after 1 week, breastfeeding rates continued to decline as the weeks progressed. By the fourth week, only 13.2% of the women reported they were breastfeeding. These findings can be compared to results of earlier studies that breastfeeding initiation rates meet the HP2020 goal, but duration rates fall short, and African American women have the lowest rates (Anstey, Chen et al., 2017)

Probable Factors That May Have Prevented Breastfeeding

Perceptions about modifiable risk factors, after receiving genetic testing or counseling about cancer risk, may explain why knowledge of family history of breast or ovarian cancer and receiving breastfeeding information from a health professional or family and friend did not significantly impact breastfeeding duration. In this study, the African American participants had the highest rates of genetic counseling (8%) and testing (5%) compared to the other races; however, they achieved the lowest breastfeeding rates. This finding supports a recent study where 87% of the participants believed genetic testing is a reliable predictor of breast cancer risks and there are modifiable risks factors; however, there was a disconnect in understanding the significance of modifiable risk factors and their association with breast cancer risk reduction (Kupsik et al., 2019). These findings suggest the important role of genetic testing and counseling and the significance of understanding modifiable risk factors associated with breast and ovarian cancer.

Socioeconomic factors may have influenced the breastfeeding outcomes of this study when considering participants' need to return to work. Approximately 26% of the participants in this study reported a household income below $16,000, which is far less than the median household income for Michigan residents and is below the 2018 U.S. federal poverty threshold for a family of two (U.S. Census Bureau, n.d.b; U.S. Department of Health and Human Services, n.d.). Thus, the financial pressure for low-income households may have sent new mothers back to the workforce prematurely and discouraged continued breastfeeding (Thomas-Jackson et al., 2016; Zhuang et al., 2019). Furthermore, employers may have not offered support to breastfeeding employees, and the overall climate of a workplace may have negatively impacted breastfeeding behavior (Whipps & Honoroff, 2019; Zhuang et al., 2019).

Impact of Receiving Breastfeeding Information and Breastfeeding Outcomes

Although breastfeeding rates for this study are consistent with previous literature, a recent study showed 59% of the African American women who had contact with a WIC peer counselor, at least one time, continued to breastfeed at 30 days postpartum (Assisby-Mensah et al., 2019). Similarly, the women in a prenatal education study tailored toward African American women in Detroit, Michigan, resulted in 67% of the participants breastfeeding at 6 weeks postpartum (Shipp et al., 2019). Overall, these studies provide confirmation that receiving breastfeeding information from a relevant source is conducive toward producing higher breastfeeding duration rates. Nearly 97% of the women in the present study reported they received breastfeeding information from a health care provider, breastfeeding support service, or family and friends, yet the breastfeeding duration rates were far below recommendations. A possible interpretation of this finding is that the information given to these women was not specific or tailored to their individual needs, whereas researchers of recent studies have recommended that breastfeeding education is more effective when it is provided through contact with the individual, is culturally relevant, and is tailored to individual needs (Assisby-Mensah et al., 2019; Shipp et al., 2019; Thomson et al., 2017) Thus, health care professionals and those who support breastfeeding women are responsible for understanding the cultural nuances surrounding breastfeeding among the people they serve, as well as their individual breastfeeding educational needs.

The Role of Health Care Professionals and Family and Friends

Although 96% of the participants received information from one or more of the sources, there is no indication of whether the information was educational or some form of support. Several studies identify the need for health care professionals to be better equipped to promote breastfeeding through education, and family and friends should be equipped to offer support to breastfeeding women. Health care providers are aware of their need to improve breastfeeding education for their patients but are not provided adequate breastfeeding education themselves (Rosen-Carole, et al., 2020, Esselmont et al., 2018). Rosen-Carole et al. (2020) found that 98% of the health care providers in their study were providing general breastfeeding support to their patients, yet 54% of the health care providers did not believe they received adequate breastfeeding education to provide adequate breastfeeding education and support to their patients. In fact, results of recent studies have suggested that participants preferred their health care providers, nurses, and other health professionals be more informed about breastfeeding, and the benefits so they can provide relevant evidence-based information during prenatal and postnatal periods (Blixt et al., 2019; Schindler-Ruwisch et al., 2019). If health care providers are given adequate breastfeeding education, they will be better equipped to educate their patients about breast and ovarian cancer risk reduction through breastfeeding.

On the other hand, some health care professionals may not understand the importance of their role. The opportunity to provide relevant breastfeeding education in a personalized manner to patients may be hindered by how health care providers view their role. Health care providers may not believe they play a significant role in breastfeeding support compared to partners and family members (Biggs et al, 2020) This mindset may discourage health care providers from having important conversations with their patients about relevant breastfeeding topics, such as the maternal health benefit of breast and ovarian cancer risk reduction. Health care professionals who understand their role in educating women about breastfeeding will make it a priority to educate their patients and their support systems and have individualized conversations with them about breastfeeding.

While it is important for health care professionals to understand their role in educating women about breastfeeding, it is just as important for family members and friends to understand their role in supporting a breastfeeding mother. Recent findings suggest that breastfeeding women prefer support from family and friends instead of breastfeeding education (Blixt et al., 2019; Schindler-Ruwisch et al., 2019). In recent studies, researchers have gone further to define specific roles that breastfeeding mothers prefer for their spouses, partners, family, and friends to play in breastfeeding support. Researchers found that longer duration in breastfeeding occurred when women received verbal encouragement and help with household and childcare duties from their partners and family members (Davidson & Ollerton, 2020; Ogbo et al., 2020). Other forms of preferred support included showing sensitivity and responsiveness toward the breastfeeding mother's needs; assistance with managing breastfeeding difficulties; offering emotional, social, and physical support; and general forms of encouragement (Davidson & Ollerton, 2020; Ogbo et al., 2020; Uluğ & Öztürk, 2020). These findings suggest that the role of support is not so obvious and therefore should be specific to the needs of the breastfeeding mother.

Family History of Breast and Ovarian Cancer and Breastfeeding Outcomes

Of the population in this study, 8.3% of the women reported having a first-degree relative with a history of breast or ovarian cancer. Studies show that having a family history of these cancers significantly increases risks of developing breast or ovarian cancer; however, breastfeeding reduces risks (Anstey, Shoemaker et al., 2017; Lin et al., 2019; Ma et al, 2017; Ross-Cowdery et al., 2017). A recent study conducted by Kotsopoulos et al. (2020) that involved women with mutated BRCA 1 or BRCA 2 genes or a personal history of breast or ovarian cancer showed a 23% reduction in breast and ovarian cancer risks when the women initiated breastfeeding and a 32% reduction when they breastfed for 7 or more months. Although the present study consisted of a small percentage of women who reported a family history of breast or ovarian cancer, breastfeeding duration was not influenced by this knowledge. A possible reason for this discrepancy might be that women do not associate breastfeeding with breast and ovarian cancer risk reduction, or they are not aware of the magnitude of the association.

In several studies, researchers have recognized an association between knowledge of family history of breast or ovarian cancer and knowledge of risks and risk factors. Sly et al. (2019) found that only 37.8% of pregnant Black women in the study had knowledge of the connection between breastfeeding and breast cancer risk reduction. This finding is congruent with the work of Sims-Mourtada et al. (2019) who found a general lack of knowledge of breast cancer prevention strategies, including the knowledge of breastfeeding as a strategy to reduce breast cancer. These findings are congruent with a much earlier study conducted by Fallowfield et al. (2010), who found that women were less knowledgeable of ovarian and breast cancer risks and risk factors, including family history. The findings from these studies underscore the importance of educational interventions that promote breastfeeding as an aid in breast and ovarian cancer risk reduction (Fallowfield et al., 2010; Sims-Mourtada et al., 2019; Sly et al., 2019).

Interpretation of Findings Based on the Theory of Planned Behavior

TPB was the theoretical framework of this study. Knowledge of family history of breast and ovarian cancer and breastfeeding information received from relevant sources were applied to determine breastfeeding behavior. TPB is made up of four major constructs that determine behavior: (a) attitude toward the behavior, (b) subjective norm, (c) perceived behavioral control, and (d) intention. This study heavily relied on perceived behavioral control, which is determined by an individual’s belief about their ability to pursue the intended behavior (Ajzen, 1991). Based on the results of this study, perceived behavioral control was not substantial enough to facilitate breastfeeding duration among the participants. Perceived behavioral control is presented as a primary TPB construct; however, it may also be an intermediary construct to actual behavioral control when behavior is dependent on having a certain level of behavioral control (Ajzen, 1991). Actual behavioral control describes the level of knowledge, skills, and resources required to achieve the desired behavior; however, more studies rely on perceived behavioral control because it is easier to measure (Ajzen, 1991). When applied to this study, it may be assumed that the participants did not adequately have the knowledge, skills, and/or resources to achieve breastfeeding duration. Recent studies have suggested that knowledge about modifiable risks factors is not associated with behavior. De Araújo Jerônimo et al. (2017) conducted an integrative review of 47 studies on breast cancer risks and concluded that knowledge of prevailing breast cancer risks coupled with knowledge of modifiable risks factors may be key to successful breast cancer prevention campaigns. Despite the conclusion given by de Araújo Jerônimo et al. (2017), Poehls et al. (2019) arrived at a contrasting conclusion. Poehls et al. (2019) conducted a study in 2016 in Germany and found that women with a family history of breast cancer had low breastfeeding rates although they were aware of both their increased risk of the disease and the modifiable risk factors. The researchers suggested that because women today are more career oriented compared to women years ago, the importance of breastfeeding has become diminished if it interferes with career attainment or advancement. Poehls et al. posited that career focused-women often delay childbearing, which ultimately causes them to undermine the importance of breast and ovarian cancer reproductive risk factors. Furthermore, the lack of maternity leave benefits and lack of workplace resources may cause women to discontinue breastfeeding (Lauer et al., 2019). Likewise, employers may not be aware of, or appreciate, the health benefits of breastfeeding and therefore may not allow or support breastfeeding (Obeng et al., 2015; Spencer et al., 2015; Thomas-Jackson et al., 2016). Interventions should include educating employers about the health benefits of breastfeeding, in addition to the subsequent benefits of reduction in lost work hours and health insurance costs (Chai et al., 2018; Lauer et al., 2019). Altogether, the findings from these studies strengthen the assertions of the TPB construct of actual behavioral control, but only when knowledge, skills, and resources can be measured to predict behavior.

Theory of Planned Behavior and Sociocultural Norms

Social and cultural norms are addressed in the TPB constructs, normative beliefs, and subjective norms. These are important factors to consider when predicting breastfeeding behavior and determining educational approaches that will address breastfeeding disparities. Normalizing breastfeeding within the African American community has been a major concern for breastfeeding women because it affects the support needed to navigate through many of the breastfeeding challenges. A common concern is that African American women lack adequate breastfeeding role models as well as social support from other women in their communities to sustain breastfeeding longevity (Alghamdi et al., 2017; Deubel et al., 2019; Kim et al., 2017). In the African American community it is often considered taboo to breastfeed older infants, especially male infants, for fear of making them too attached to the mother (Kim et al., 2017). Additionally, some women believe that breasts are sexualized by men and, as a result, feel uncomfortable with long-term breastfeeding (Kim et al., 2017). Although the PRAMS data set for this study did not contain information about social and cultural norms of breastfeeding mothers, it is acceptable to believe that they serve as contributing factors to the breastfeeding outcomes.

Limitations of the Study

This study had several limitations to consider. One of the main limitations is the use of secondary data. On one hand the PRAMS data set allows researchers access to a large-scale data set with extensive data on maternal attitudes and experiences, which saves time, money, and other resources; however, it does not allow researchers the ability to make sure the information is accurate and complete. In the Michigan PRAMS data set, each variable contained missing information; either the respondent did not know the answer or skipped the question altogether. This missing information did not affect the power of the analyses for each research question, yet if the missing information were available, the results of the analyses may have been different. Another limitation of the study involved the variable, breastfeeding information received from a health care provider, breastfeeding support service, or family and friend. Respondents were not able to specify the type of information or the quality of breastfeeding information received from either of these sources. Therefore, there is no way to verify topics discussed, specifically regarding breastfeeding duration and breast and ovarian cancer risks.

Michigan was selected for this study because it was one of the four states with a high population of African American participants and that collected data on family history of breast and ovarian cancer. Consequently, the results of this study are limited to the state of Michigan. Lastly, as previously noted, the PRAMS questionnaire is administered when participants are between 2-4 months postpartum, which increases the potential for recall bias and the potential for questions to be answered inaccurately or left unanswered. Particularly, memory of breastfeeding information received, likely months before, could be difficult to remember.

Recommendations

Future research will have to address the relationships between knowledge of family history of breast or ovarian cancer, breastfeeding information received from health care providers, breastfeeding support services, and family and friends, in more detail. The results of this study revealed no significant relationships between the variables for the state of Michigan. A comparable study that compares all four states that collect PRAMS data on family history of breast and ovarian cancer would offer insight on educational and policy needs. Significant results from either of the states could bring to light successful programs or policies that encourage women with a family history of breast or ovarian cancer to breastfeed for longer. Thus, states, like Michigan could investigate whether a similar program would benefit their breastfeeding education efforts and improve breastfeeding duration among African American women with a family history of breast or ovarian cancer. Future studies should also address the individual level of influence that each source of breastfeeding information (health care providers, breastfeeding support services, and family and friends) have on breastfeeding duration.

Another recommendation for future research would be to conduct a case-control study where one group of African American women are offered genetic testing and counseling and are informed about their risks and modifiable risk factors for breast and ovarian cancer risk reduction, while the other group is given standard breastfeeding education. Another component to this program would be to invite the family and friends to receive education on breastfeeding and how to support their loved one. This type of study would allow a comparison of breastfeeding outcomes between the two groups, inform breastfeeding education practices and policy, and shed light on the role that genetic counseling and testing plays in improving breastfeeding rates among women with a high risk of breast or ovarian cancer.

Implications for Positive Social Change

The findings from this study suggest that more needs to be done to improve breastfeeding rates among high-risk women, such as improving breastfeeding education for pregnant and breastfeeding individuals. Particularly, improved educational techniques will assist in raising awareness about the connection between breastfeeding, breast and ovarian cancer, and family history of these cancers. The findings from this study may strengthen partnerships between health care providers and community partners that promote and support breastfeeding, such as local hospitals, WIC, and the local La Leche League chapter. This type of collaboration will ensure that breastfeeding information will reach the individual and the community. Likewise, collaborations between organizations that promote breastfeeding and breast and ovarian cancer prevention would improve advocacy for breastfeeding, genetic testing, and screenings for breast and ovarian cancer the community.

For these efforts to reap long-term results, polices that support breastfeeding women to overcome common breastfeeding barriers will need additional reinforcement. One common barrier that women face is the perception of low milk supply. Findings from this study could be used to promote policies that offer in-home lactation sessions to be covered through all insurance plans. Another common barrier that women face with breastfeeding is the need to return to work. Polices could be enacted that will invite employers to establish a detailed plan to support their breastfeeding employees and in return would receive grant funds or qualify for a reduction in insurance premiums on an annual basis.

Recommendations for Practice

Efforts to educate women and their families about the maternal health benefit of breast and ovarian cancer risk reduction is critical, even more for women with a family history of these cancers. These educational efforts must be effective enough to empower individuals to not only consider breastfeeding, but to overcome barriers that may discourage them from initiating and continuing with breastfeeding for the recommended time frame. To achieve such an undertaking, health care providers, breastfeeding support services, and family and friends must be included in these efforts. Health care providers, first, need to be empowered to educate and support breastfeeding. Breastfeeding support services also need to be knowledgeable about how to educate and support women towards their breastfeeding goal. To reach the target population, innovative educational programs through individual conversations, community outreach programs, or marketing through social media are recommended.

Conclusion

Breastfeeding offers numerous health benefits, whereas breast and ovarian cancer risk reduction are significant. Women need to be aware of how breastfeeding can personally benefit their health, yet those most affected by these cancers should be well informed of their risks and the health behaviors that can decrease risks. African American women have the highest mortality rate from breast and ovarian cancers and the lowest breastfeeding rates when compared to other racial groups. Therefore, it is vital that African American women are informed about these risks. The purpose of this study was to determine whether breastfeeding information from health care providers, breastfeeding support services, or family and friends could influence breastfeeding duration among African American women with a family history of breast or ovarian cancer. The findings from this study showed that there is no statistically significant association between these variables. These results suggest there are deficiencies in how African American women are being educated about breastfeeding and breast and ovarian cancer risks. Interventions to improve breastfeeding education quality and techniques, strengthen partnerships among community organizations, encourage employer support, and enact policies to safeguard breastfeeding efforts are recommended. Further studies will need to shed light on the extent to which women are being informed of breast and ovarian cancer risks and modifiable risk factors such as breastfeeding.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Ajzen, I. (2011). The theory of planned behaviour: Reactions and reflections. *Psychology & Health, 26*(9), 1113–1127. https://doi.org/10.1080/08870446.2011.613995

Ajzen, I. (2019). *Theory of planned behavior diagram*. http://people.umass.edu/aizen/tpb.diag.html#null-link

Alghamdi, S., Horodynski, M., & Stommel, M. (2017). Racial and ethnic differences in breastfeeding, maternal knowledge, and self-efficacy among low-income mothers. *Applied Nursing Research, 37*, 24–27. https://doi.org/10.1016/j.apnr.2017.07.009

Akinyemiju, T. F., Soliman, A. S., Copeland, G., Banerjee, M., Schwartz, K., & Merajver, S. D. (2013). Trends in breast cancer stage and mortality in Michigan (1992–2009) by race, socioeconomic status, and area healthcare resources. *Plos One, 8*(4), e61879. https://doi.org/10.1371/journal.pone.0061879

American Academy of Pediatrics. (2012). Policy statement: Breastfeeding and the use of human milk. *Pediatrics, 129*(3), e827–e841. https://doi.org/10.1542/peds.2011-3552

American Academy of Pediatrics. (2021). *Breastfeeding: Benefits of breastfeeding*. https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Breastfeeding/Pages/Benefits-of-Breastfeeding.aspx

Andrews, L., & Mutch, D. G. (2017). Hereditary ovarian cancer and risk reduction. *Best*

Practice & Research Clinical Obstetrics & Gynaecology, 41, 31–48. https://doi.org/10.1016/j.bpobgyn.2016.10.017

Anstey, E. H., Chen, J., Elam-Evans, L. D., & Perrine, C. G. (2017). Racial and geographic differences in breastfeeding — United States, 2011–2015. *Morbidity and Mortality Weekly Report MMWR, 66*, 723–727. https://doi.org/10.15585/mmwr.mm6627a3

Anstey, E. H., Shoemaker, M. L., Barrera, C. M., O'Neil, M. E., Verma, A. B., & Holman, D. M. (2017). Breastfeeding and breast cancer risk reduction: Implications for Black mothers. *American Journal of Preventive Medicine, 53*(3S1), S40–S46. https://doi.org/10.1016/j.amepre.2017.04.024

Assibey-Mensah, V., Suter, B., Thevenet-Morrison, K., Widanka, H., Edmunds, L., Sekhobo, J., & Dozier, A. (2019). Effectiveness of peer counselor support on breastfeeding outcomes in WIC-enrolled women. *Journal of Nutrition Education and Behavior, 51*(6), 650–657. https://doi.org/10.1016/j.jneb.2019.03.005

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173–1182. https://doi.org/10.1037/0022-3514.51.6.1173

Bertoni, N., de Souza, M. C., Crocamo, S., Szklo, M., & de Almeida, L. M. (2019). Is a family history of the breast cancer related to women's cancer prevention behaviors? *International Journal of Behavioral Medicine, 26*(1), 85–90. https://doi.org/10.1007/s12529-018-9737-9

Biggs, K. V., Fidler, K. J, Shenker, N. S., & Brown, H. (2020). Are the doctors of the future ready to support breastfeeding? A cross-sectional study in the UK. *International Breastfeeding Journal, 15*(1), 1–8. https://doi.org/10.1186/s13006-020-00290-z

Blixt, I., Johansson, M., Hildingsson, I., Papoutsi, Z., & Rubertsson, C. (2019). Women's advice to healthcare professionals regarding breastfeeding: "offer sensitive individualized breastfeeding support"- an interview study. *International Breastfeeding Journal, 14*(1), 1–12. https://doi.org/10.1186/s13006-019-0247-4

Breastcancer.org. (2018). *What is breast cancer?* https://www.breastcancer.org/symptoms/understand_bc/what_is_bc

Brown, A. (2017). Breastfeeding as a public health responsibility: A review of the evidence. *Journal of Human Nutrition and Dietetics, 30*(6), 759–770. https://doi.org/10.1111/jhn.12496

Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research*. Houghton Mifflin.

Centers for Disease Control and Prevention. (2020). *Breastfeeding: Call to action*. https://www.cdc.gov/breastfeeding/resources/calltoaction.htm

Centers for Disease Control and Prevention. (2018). *Breastfeeding report card*. https://www.cdc.gov/breastfeeding/data/reportcard.htm

Centers for Disease Control and Prevention. (2020). *Nationwide breastfeeding goals*. https://www.cdc.gov/breastfeeding/data/facts.html

Centers for Disease Control and Prevention. (2019). *National Center for Health*

Statistics. https://www.cdc.gov/nchs/data/databriefs/db346-h.pdf

Centers for Disease Control and Prevention. (2021). *PRAMS*. https://www.cdc.gov/prams/index.htm

Canicali Primo, C., de Oliveira Nunes, B., de Fátima Almeida Lima, E., Marabotti Costa Leite, F., Barros de Pontes, M., & Gomes Brandão, M. A. (2016). Which factors influence women in the decision to breastfeed? *Investigation & Education*, *34*(1), 198–217. https://doi.org/10.17533/udea.iee.v34n1a22

Chai, Y., Nandi, A., & Heymann, J. (2018). Does extending the duration of legislated paid maternity leave improve breastfeeding practices? Evidence from 38 low-income and middle-income countries. *BMJ Global Health, 3*(5). https://doi.org/10.1136/bmjgh-2018-001032

Davidson, E. L., & Ollerton, R. L. (2020). Partner behaviours improving breastfeeding outcomes: An integrative review. *Women & Birth*, *33*(1), e15–e23. https://doi.org/10.1016/j.wombi.2019.05.010

Deubel, T. F., Miller, E. M., Hernandez, I., Boyer, M., & Louis-Jacques, A. (2019). Perceptions and practices of infant feeding among African American women. *Ecology of Food & Nutrition*, *58*(4), 301. https://doi.org/10.1080/03670244.2019.1598977

Eastin, A., & Sharma, M. (2015). Using social cognitive theory to predict breastfeeding in African-American Women. *American Journal of Health Studies*, *30*(4), 196–202.

Esselmont, E., Moreau, K., Aglipay, M., & Pound, C. M. (2018). Residents' breastfeeding knowledge, comfort, practices, and perceptions: results of the Breastfeeding Resident Education Study (BRESt). *BMC Pediatrics*, *18*(1), 1–7. https://doi.org/10.1186/s12887-018-1150-7

Fallowfield, L., Fleissig, A., Barrett, J., Menon, U., Jacobs, I., Kilkerr, J., Farewell, V., & UKCTOCS Trialists. (2010). Awareness of ovarian cancer risk factors, beliefs and attitudes towards screening: baseline survey of 21 715 women participating in the UK Collaborative Trial of Ovarian Cancer Screening. *British Journal of Cancer*, *103*(4), 454– 461. https://doi.org/10.1038/sj.bjc.6605809

Faul, F., Erdfelder, E., Lang, A., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behavior Research Methods, *39*(2), 175-191. https://doi.org/10.3758/bf03193146

Faupel-Badger, J. M., Arcaro, K. F., Balkam, J. J., Eliassen, H., Hassiotou, F., Lebrilla, C. B., Michels, K. B., Palmer, J. R., Schedin, P., Stuebe, A. M., Watson, C. J., & Sherman, M. E. (2013). Postpartum remodeling, lactation, and breast cancer risk: Summary of a national cancer institute–sponsored workshop. *Journal of the National Cancer Institute*, *105*(3), 166–174. https://doi.org/10.1093/jnci/djs505

Furman, L., Matthews, L., Davis, V., Killpack, S., & O'Riordan, M. (2016). Breast for success: A community–academic collaboration to increase breastfeeding among high-risk mothers in Cleveland. The Johns Hopkins University Press, *3*, 341-353. https://doi.org/10.1353/cpr.2016.0041

Gaitskell, K., Green, J., Pirie, K., Barnes, I., Hermon, C., Reeves, G. K., Beral, V. (2018).

Histological subtypes of ovarian cancer associated with parity and breastfeeding in the prospective Million Women Study. *International Journal of Cancer*, *142*(2), 281–289. https://doi.org/10.1002/ijc.31063

Gluz, O., Liedtke, C., Gottschalk, N., Pusztai, L., Nitz, U., & Harbeck, N. (2009). Triple-negative breast cancer--current status and future directions. *Annals of Oncology: Official Journal of the European Society for Medical Oncology*, *20*(12), 1913–1927. https://doi.org/10.1093/annonc/mdp492

Guo, F., Kuo, Y., Shih, Y. C. T., Giordano, S. H., & Berenson, A. B. (2018). Trends in breast cancer mortality by stage at diagnosis among young women in the United States. *Cancer*, *124*(17), 3500–3509. https://doi.org/10.1002/cncr.31638

Guo, J. L., Wang, T. F., Liao, J. Y., & Huang, C. M. (2016). Efficacy of the theory of planned behavior in predicting breastfeeding: Meta-analysis and structural equation modeling. *Applied Nursing Research*, *29*, 37–42. https://doi.org/10.1016/j.apnr.2015.03.016

Ham, Y., Oh, H. Y., Seo, S. S., & Kim, M. K. (2016). Association between health behaviors and a family history of cancer among Korean Women. *Cancer Research and Treatment*, *48*(2), 806–814. https://doi.org/10.4143/crt.2015.083

Hayes, A.F. (2017). *Introduction to mediation, moderation, and conditional process analysis* (2nd ed). Guilford Press.

Islami, F., Liu, Y., Jemal, A., Zhou, J., Weiderpass, E., Colditz, G., Boffetta, P., Weiss, M. (2015). Breastfeeding and breast cancer risk by receptor status-a systematic review and meta-analysis. *Annals of Oncology*, *26*(12), 2398–2407.

https://doi.org/10.1093/annonc/mdv379

Jacobson, L. T., Twumasi-ankrah, P., Redmond, M. L., Ablah, E., Hines, R. B., Johnston, J., & Collins, T. C. (2015). Characteristics associated with breastfeeding behaviors among urban versus rural women enrolled in the Kansas WIC program. *Maternal and Child Health Journal*, *19*(4), 828-839. https://doi.org/10.1007/s10995-014-1580-2

Johnson, A. M., Rooks, A. J., Kirk, R., & Muzik, M. (2016). Enhancing breastfeeding through healthcare support: Results from a focus group study of African American mothers. *Maternal and Child Health Journal*, 20S92- S102. https://doi.org/10.1007/s10995-016-2085-y

Jones, M. R., Kamara, D., Karlan, B. Y., Pharoah, P. D. P., & Gayther, S. A. (2017). Genetic epidemiology of ovarian cancer and prospects for polygenic risk prediction. *Gynecologic Oncology*, *147*(3), 705–713. https://doi.org/10.1016/j.ygyno.2017.10.001

Jordan, S. J., Cushing-Haugen, K. L., Wicklund, K. G., Doherty, J. A., & Rossing, M. A. (2012). Breast-feeding and risk of epithelial ovarian cancer. *Cancer Causes & Control, 23*(6), 919–927. https://doi.org/10.1007/s10552-012-9963-4

Kim, J. H., Fiese, B. H., & Donovan, S. M. (2017). Breastfeeding is natural but not the cultural norm: A mixed-methods study of first-time breastfeeding, African American mothers participating in WIC. *Journal of Nutrition Education and Behavior*, *49*(72), S151–S161. https://doi.org/10.1016/j.jneb.2017.04.003

Kotsopoulos, J., Gronwald, J., McCuaig, J. M., Karlan, B. Y., Eisen, A., Tung, N., Bordeleau, L., Senter, L., Eng, C., Couch, F., Fruscio, R., Weitzel, J. N., Olopade, O., Singer, C. F., Pal, T., Foulkes, W. D., Neuhausen, S.L., Sun, P., Lubinski, J., & Narod, S.A. (2020). Breastfeeding and the risk of epithelial ovarian cancer among women with a BRCA1 or BRCA2 mutation. *Gynecologic Oncology*. https://doi.org/10.1016/j.ygyno.2020.09.037

Lau, C. Y. K., Lok, K. Y. W., & Tarrant, M. (2018). Breastfeeding duration and the theory of planned behavior and breastfeeding self-efficacy framework: A systematic review of observational studies. *Maternal & Child Health Journal*, *22*(3), 327–342. https://doi.org/10.1007/s10995-018-2453-x

Lauer, E.A., Armenti, L., Henning, M., & Sirois, L. (2019). Identifying barriers and supports to breastfeeding in the workplace experienced by mothers in the New Hampshire Special Supplemental Nutrition Program for Women, Infants, and Children utilizing the Total Worker Framework. *International Journal of Environmental Research and Public Health, 16*(4). https://doi.org/10.3390/ijerph16040529

LaVecchia, C., & Franceschi, S. (1999). Oral contraceptives and ovarian cancer. *European Journal of Cancer Prevention*, *8*, 297-304.

Lane-Claypon, J.E. (1926). A further report on cancer of the breast with special reference to its associated antecedent conditions. *Ministry of Health: Reports of Public Health and Medical Subjects*, *32*, 1–189. HMSO.

Lind, J. N., Perrine, C. G., Li, R., Scanlon, K. S., & Grummer-Strawn, L. M. (2014). Racial disparities in maternity care practices that support breastfeeding—United

States, 2011. *Morbidity and Mortality Weekly Report, 63*(33), 725–728. https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6333a2.htm

Louis-Jacques, A., Deubel, T. F., Taylor, M., & Stuebe, A. M. (2017). Racial and ethnic disparities in U.S. breastfeeding and implications for maternal and child health outcomes. *Seminars in Perinatology*, *41*, 299–307. https://doi.org/10.1053/j.semperi.2017.04.007

Luan, N. N., Wu, Q. J., Gong, T. T., Vogtmann, E., Wang, Y. L., & Lin, B. (2013). Breastfeeding and ovarian cancer risk: A meta-analysis of epidemiologic studies. *The American Journal of Clinical Nutrition*, *98*(4), 1020–1031. https://doi.org/10.3945/ajcn.113.062794

Ma, H., Ursin, G., Xu, X., Lee, E., Togawa, K., Duan, L., Lu, Y., Malone, K. E., Marchbanks, P. A., McDonald, J. A., Simon, M. S., Folger, S. G., Sullivan-Halley, J., Deapen, D. M., Press, M. F., & Bernstein, L. (2017). Reproductive factors and the risk of triple-negative breast cancer in white women and african-american women: A pooled analysis. *Breast Cancer Research*, *19*(1), 1–14. https://doi.org/10.1186/s13058-016-0799-9

Malvezzi, M., Carioli, G., Rodriguez, T., Negri, E., & La Vecchia, C. (2016). Global trends and predictions in ovarian cancer mortality. *Annals of Oncology*, *27*(11), 2017–2025. https://doi.org/10.1093/annonc/mdw306

McGinnis, S., Lee, E., Kirkland, K., Miranda-Julian, C., & Greene, R. (2018). Let's talk about breastfeeding: The importance of delivering a message in a home visiting program. *American Journal of Health Promotion*, *32*(4), 989– 996.

https://doi.org/10.1177/0890117117723802

Meisel, S. F., Fraser, L. S. M., Side, L., Gessler, S., Hann, K. E. J., Wardle, J., & Lanceley, A. (2017). Anticipated health behaviour changes and perceived control in response to disclosure of genetic risk of breast and ovarian cancer: A quantitative survey study among women in the UK. *BMJ Open*, *7*(12). https://doi.org/10.1136/bmjopen-2017-017675

Michigan Department of Health and Human Services. (2019). *Cancer Epidemiology*. https://www.michigan.gov/mdhhs/0,5885,7-339-71550_5104_5279_71397_93321---,00.html

Michigan Department of Health and Human Services. (2017). Michigan Health Statistics. http://www.mdch.state.mi.us/osr/Index.asp

Michigan Department of Health and Human Services. (2020). Michigan PRAMS Report. https://www.michigan.gov/mdhhs/0,5885,7-339-73971_4911_21428-456262--,00.html

Modugno, F., Goughnour, S. L., Wallack, D., Edwards, R. P., Odunsi, K., Kelley, J. L., Moysich, K., Ness, R. B., Brooks, M. M. (2019). Breastfeeding factors and risk of epithelial ovarian cancer. *Gynecologic Oncology*, *153*(1), 116–122. https://doi.org/10.1016/j.ygyno.2019.01.017

Momenimovahed Z, Tiznobaik A, Taheri S, & Salehiniya H. (2019). Ovarian cancer in the world: epidemiology and risk factors. *International Journal of Women's Health*, *287*. https://doi.org/10.2147/IJWH.S197604

Montaño, D.E., & Kasprzyk, D. (2015). Theory of reasoned action, theory of planned behavior, and the integrated behavioral model. In Glanz, K., Rimer, B. K., & Viswanath, K. (Eds.), Health behavior: Theory, research, and practice (5th ed., pp. 95–124). Jossey-Bass.

Moorman, P. G., Alberg, A. J., Bandera, E. V., Barnholtz-Sloan, J., Bondy, M., Cote, M. L., Funkhouser, E., Peters, E. S., Schwartz, A. G., Terry, P., Crankshaw, S., Wang, F., & Schildkraut, J. M. (2016). Reproductive factors and ovarian cancer risk in African-American women. *Annals of Epidemiology*, 26654–662 https://doi.org/10.1016/j.annepidem.2016.07.004

National Ovarian Cancer Coalition (NOCC). (n.d.). *What is ovarian cancer?* http://ovarian.org/about-ovarian-cancer/what-is-ovarian-cancer

Obeng, C. S., Emetu, R. E, & Curtis, T. J. (2015). African American women's perceptions and experiences about breastfeeding. *Frontiers in Public Health*, *3*, 518–531. http://doi.org/10.3389/fpubh.2015.00273/full

Ogbo, F. A., Akombi, B. J., Ahmed, K. Y., Rwabilimbo, A. G., Ogbo, A. O., Uwaibi, N. E., Ezeh, O. K., & Agho, K. E. (2020). Breastfeeding in the community-how can partners/fathers help? A systematic review. *International Journal of Environmental Research and Public Health, 17*(2). https://doi.org/10.3390/ijerph17020413

Okeke, N., Saxton, D., & Mandell, D.J. (2013). 2011 Annual report: Texas Pregnancy Risk Assessment Monitoring System. *Texas Division for Family and Community Health Services, Texas Department of State Health Services.* https://dshs.texas.gov/mch/pdf/PRAMS_2011AnnualReport_Final_072214.doc

Rehman, R., Malik, F. R., Sabiha, Z. A., & Rehman, Z. (2017). Awareness of mothers regarding duration and benefits of breastfeeding. *Gomal Journal of Medical Sciences*, *15*(2), 78–82.

Reno, R., Barnhart, S., & Gabbe, P. T. (2018). A critical inquiry of breastfeeding attitudes, barriers, and experiences of African American women living in poverty. *Journal of Poverty*, *22*(6), 518–536. https://doi.org/10.1080/10875549.2018.1496374

Reyes, C., Barakat-Haddad, C., Barber, W., & Abbass-Dick, J. (2019). Investigating the effectiveness of school-based breastfeeding education on breastfeeding knowledge, attitudes and intentions of adolescent females. *Midwifery*, *70*, 64–70. https://doi.org/10.1016/j.midw.2018.12.010

Rodriguez, V. M., Gyure, M. E., Corona, R., Bodurtha, J. N., Bowen, D. J., & Quillin, J. M. (2015). What women think: Cancer causal attributions in a diverse sample of women. *Journal of Psychosocial Oncology*, *33*(1), 48–65. https://doi.org/10.1080/07347332.2014.977419

Rosen-Carole, C., Allen, K., Thompson, J., Martin, H., Goldstein, N., & Lawrence, R. A. (2020). Prenatal provider support for breastfeeding: Changes in attitudes, practices, and recommendations over 22 years. *Journal of Human Lactation*, *36*(1), 109–118. https://doi.org/10.1177/0890334419830996

Ross-Cowdery, M., Lewis, C. A., Papic, M., Corbelli, J., & Schwarz, E. B. (2017). Counseling about the maternal health benefits of breastfeeding and mother's intentions to breastfeed. Maternal and Child Health Journal, *21*(2), 234-241.

https://doi.org/10.1007/s10995- 016-2130-x

Sauter, E. R. (2018). Breast cancer prevention: Current approaches and future directions. *Journal of Breast Health*, *14*(2), 64–71. https://doi.org/10.5152/ejbh.2018.3978

Schindler-Ruwisch, J., Roess, A., Robert, R. C., Napolitano, M., Woody, E., Thompson, P., & Ilakkuvan, V. (2019). Determinants of breastfeeding initiation and duration among African American DC WIC recipients: Perspectives of recent mothers. *Women's Health Issues*, *29*(6), 513–521. http://doi.org/10.1016/j.whi.2019.07.003

Shafrir, A. L., Schock, H., Poole, E. M., Terry, K. L., Tamimi, R. M., Hankinson, S. E., Rosner, B.A., & Tworoger, S. S. (2017). A prospective cohort study of oral contraceptive use and ovarian cancer among women in the United States born from 1947 to 1964. *Cancer Causes & Control*, *28*(5), 371–383. https://doi.org/10.1007/s10552-017-0876-0

Sheridan, W., Scott, T., Caroline, S., Yvonne, Z., Vanessa, B., David, V., Karen, G., & Stephen, C. (2014). Breast cancer in young women: Have the prognostic implications of breast cancer subtypes changed over time? *Breast Cancer Research and Treatment*, *147*(3), 617– 629. https://doi.org/10.1007/s10549-014-3125-1

Shipp, G., Weatherspoon, L., Comstock, S., Norman, G., Alexander, G., & Kerver, J. (2019). Breastfeeding self-efficacy of African American women in late pregnancy as a predictor of breastfeeding intensity at 6 weeks postpartum...Food & Nutrition Conference & Expo, 26-29 October 2019, Philadelphia, PA. *Journal of the Academy of Nutrition & Dietetics*, *119*(9), A72.

https://doi.org/10.1016/j.jand.2019.06.209

Shulman, H. B., D'Angelo, D. V., Harrison, L., Smith, R. A., & Warner, L. (2018). The Pregnancy Risk Assessment Monitoring System (PRAMS): Overview of Design and Methodology. *American Journal of Public Health*, *108*(10), 1305–1313. https://doi.org/10.2105/AJPH.2018.304563

Sims-Mourtada, J., Catts, Z., Swanson, P., & Katurakes, N. (2019). Engaging African Americans in breast cancer prevention strategies: A partnership between a community cancer center and the African American community in Delaware [Editorial]. *Cancer Stud Mol Med Open J*, *5*(1), E1- E3. https://doi.org/10.17140/CSMMOJ-5-e007

Sly, J. R., Miller, S. J., Thelemaque, L., Yazdanie, F., Sperling, R., Sasan, F., Howell, E. A., Loudon, H., & Jandorf, L. (2020). Knowledge of the relationship between breastfeeding and breast cancer risk among racial and racial and ethnic minority women. *Journal of Cancer Education: The Official Journal of the American Association for Cancer Education*, *35*(6), 1193–1196. https://doi.org/10.1007/s13187-019-01580-9

Sopik, V., Iqbal, J., Rosen, B., & Narod, S. A. (2015). Why have ovarian cancer mortality rates declined? Part I. Incidence. *Gynecologic Oncology*, *138*(3), 741–749. https://doi.org/10.1016/j.ygyno.2015.06.017

Spector, D., DeRoo, L. A., & Sandler, D. P. (2011). Lifestyle behaviors in black and white women with a family history of breast cancer. *Preventive Medicine*, *52*(5), 394–397. https://doi.org/10.1016/j.ypmed.2011.03.001

State of Michigan. (2019). *Michigan counties list*. https://www.michigan.gov/som/0,4669,7-192-29701_31713_31714-97053--,00.html

Statistics Solutions. (2013). *Data analysis plan: Mediation analysis*. http://www.statisticssolutions.com/academic-solutions/member-resources/member-profile/data-analysis-plan-templates/data-analysis-plan-mediation-analysis/

Stuebe, A. M., & Schwartz, E. B. (2010). The risks and benefits of infant feeding practices for women and their children. *Journal of Perinatology*, *3*, 155–62. https://doi.org/10.1038/jp.2009.107

Sung, H. K., Ma, S. H., Choi, J. Y., Hwang, Y., Ahn, C., Kim, B. G., Kim, Y. M, Kim, J. W., Kang, S., Kim, J., Kim, T. J., Yoo, K. Y., Kang, D., Park, S. (2016). The effect of breastfeeding duration and parity on the risk of epithelial ovarian cancer: A systematic review and meta-analysis. *Journal of Preventive Medicine and Public Health*, *49*(6), 349–366. https://doi.org/10.3961/jpmph.16.066

Thomas-Jackson, S. C., Bentley, G. E., Keyton, K., Reifman, A., Boylan, M., & Hart, S. L. (2016). In-hospital breastfeeding and intention to return to work influence mothers' breastfeeding intentions. *Journal of Human Lactation: Official Journal of International Lactation Consultant Association*, *32*(4), NP76–NP83. https://doi.org/10.1177/0890334415597636

Thrower, A. C., & Peoples, M. (2015). Creating tipping points to eliminate breastfeeding barriers. *International Journal of Childbirth Education*, *30*(4), 28–30.

Uluğ, E., & Öztürk, S. (2020). The effect of partner support on self-efficiency in breastfeeding in the early postpartum period. *American Journal of Family Therapy, 48*(2), 211-219. https://doi.org/10.1080/01926187.2019.1697973

U.S. Census Bureau. (n.d.a). *American Community Survey*. https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/

U.S. Census Bureau. (n.d.b). *Quick facts Michigan*. https://www.census.gov/quickfacts/MI

U.S. Department of Health and Human Services. Office of the Assistant Secretary for Planning and Evaluation. (n.d.). *2018 Poverty Guidelines*. https://aspe.hhs.gov/2018-poverty-guidelines

U.S. Department of Health and Human Services. Office of Disease Prevention and Health Promotion. (2014). *Healthy People 2020*. https://www.healthypeople.gov/2020/topics-objectives/topic/maternal-infant-and-child-health

United States Department of Agriculture. (2017, Aug 10). *WIC breastfeeding data local agency report*. https://fnsprod.azureedge.net/sites/default/files/wic/FY2016-BFDLA-Report.pdf

Walsh, T., Casadei, S., Lee, M. K., Pennil, C. C., Nord, A. S., Thornton, A. M., Roeb, W., Agnewy, K. J., Stray, S. M., Wickramanayake, A., Norquist, B., Pennington, K. P., Garcia, R. L., King, M. C., & Swisher, E. M. (2011). Mutations in 12 genes for inherited ovarian, fallopian tube, and peritoneal carcinoma identified by massively parallel sequencing. *Proceedings of the National Academy of Sciences* *of the United States of America*, *108*(44), 18032–18037. https://doi.org/10.1073/pnas.1115052108

Whipps, M. D. M., & Honoroff, J. (2019). Time off work after childbirth and breastfeeding supportive workplaces: Associations with near-exclusive breastfeeding trajectory membership. *Women's Health Issues*, *29*(6), 506–512. https://doi.org/10.1016/j.whi.2019.08.006

Williams, E. K., & Smith, E. (2018). Lactation: Defense for maternal health. *International Journal of Childbirth Education*, *33*(4), 23–25.

Young, S. R., Pilarski, R. T., Donenberg, T., Shapiro, C., Hammond, L. S., Miller, J., Brooks, K. A., Cohen, S., Tenenholz, B., DeSai, D., Zandvakili, I., Royer, R., Song, L., & Narod, S. A. (2009). The prevalence of BRCA1 mutations among young women with triple-negative breast cancer. *BMC Cancer*, *9*(86), 1913–1927. https://doi.org/10.1186/1471-2407-9-86