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Philippine-Based Filipino Women and Breast Cancer

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DOCTOR OF PHILOSOPHY IN NURSING EDUCATION

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Abstract

Background. The rate of breast cancer incidence in the Philippines has increased in recent years. Three out of 100 Filipino women will contract breast cancer before age 75; one out of 100 will die before age 75.

Purpose. The study was used to determine the level of knowledge of the respondents about breast cancer and breast cancer screening modalities, the relationship of the level of knowledge and frequency of breast self-examination (BSE) performance; the predictive ability of their health perceptions; modifying variables for their intent to perform BSE, submit to screening mammography, and engage in clinical breast exam (CBE); their sources of information; and preferred educational platforms.

Theoretical Framework. The health belief model was used to guide the study to ascertain the predictive ability of the respondents' perceptions and modifying variables.

Methods. A quantitative exploratory design utilizing the messaging feature of a social media for recruitment was used. McCance's Breast Cancer Knowledge Test (BCKT), Champion's Revised Susceptibility, Benefits and Barriers Scale for Mammography (RSBBSM), and Sunil et al.'s CBE were the tools used to collect data via Qualtrics. Descriptive static, correlation, and logistic regressions were used.

Results. Breast-cancer-related knowledge was moderate level and has positive correlation with the frequency by which BSE is performed. Breast-cancer-related knowledge and perceptions about barriers to BSE and CBE were predictive of the intent to perform BSE, submit to mammography, and engage in CBE. The modifying variables were found to have no predictive ability.

Conclusion. Understanding respondents' knowledge and perceptions has highlighted areas for improving breast health, such as creation of nursing courses, community outreach and advocacy activities, health policy changes, and further studies on the topic.

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To God be Glory!

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Chapter One

The Problem and Domain of Inquiry

With this quantitative study, the investigator explored the knowledge level of Philippine-based Filipino women for breast cancer and breast cancer screening modalities, including their perceptions about health beliefs for their susceptibility, seriousness/severity of the disease, benefits and barriers of breast self-examination (BSE), screening mammography, and clinical breast examination (CBE). The investigator also explored the relationship between the respondents' knowledge, level, and frequency by which they perform breast self-examination; their current sources of acquiring information; and whether their breast-cancer-related knowledge, perceptions, personal modifying factors, and sources of information were significant predictors of their intent to perform BSE, submit to screening mammography, and engage in CBE.

Despite advances in breast cancer screening technology and multiple efforts to educate women, the risk of developing the disease lingers and is on the rise in developing countries (Omatara, Yahya, Amodu, & Bimba, 2012) like the Philippines. In the Philippines, breast cancer is the number one malignancy in women (Laudico et al. 2010). It has the most number of breast cancer cases among Asian nations (Asia News Monitor, 2015). In the global landscape, economically developing countries of which the Philippines is one, it was projected by GLOBOCON that there were around 691,300 new female breast cancer cases and 268,900 estimated number of deaths from this disease in

2008 (Jemal et al., 2011). It was further reported that there is an increasing trend in the incidence and mortality rates in breast cancer among Asian countries. Sixty percent of deaths from breast cancer are projected to occur in economically developing countries. The breast cancer five-year survival rate from populations from economically developing Asian nations, such as the Philippines, is estimated to be about 50% or less compared with the 75% five-year survival rate from more progressive Asian nations, such as Singapore, South Korea, and some parts of China (Jemal et al., 2011). The Philippine Society of Medical Oncology reported an estimate of three out of 100 Filipino women living in the Philippines will contract breast cancer before age 75, and one out of 100 will die from breast cancer before age 75 (Asia News Monitor, 2015).

Outside of the Philippines, breast cancer remains the leading cause of death among migrant Filipino women in the United States (Office of Minority Health [OMH], 2013). The report of the OMH (2013) is corroborated in part by Simpson, Briggs, and George (2015) in their findings of a retrospective epidemiological cohort study in which they studied migrant Filipino women who were being surgically treated for breast cancer in an urban hospital in Canada from 2002 to 2012. They reported that migrant Filipino women were diagnosed at a significantly younger age (53.2) and that they were more likely to develop the more aggressive type of breast cancer (Simpson et al., 2015) and to die from it (Ho, Muraoka, Cuaresma, Guerrero, & Agbayani, 2010; OMH, 2013). Miller, Chu, Hankey, and Ries (2008) also supported an earlier report, despite lower incidence of

breast cancer among migrant Filipino women compared with other ethnic groups, migrant Filipino women have the highest incidence of mortality from breast cancer. Ooi, Martinez, and Li (2011) confirmed this finding, and they reported that compared with other Asian subgroups, Filipino women had the poorest outcomes and that they were likely to present with advanced stage breast cancer.

Although most of the published studies on breast cancer and Filipino women were conducted outside of the Philippines and involved immigrant Filipino women, some of the barriers to obtaining breast cancer screening of migrant Filipino women can be traced back to their homeland country (Wu & Bancroft, 2006). For instance, Wu and Bancroft (2006) found that migrant Filipino women lack understanding about breast cancer and breast cancer screening modalities. Filipino women have the misconception that breast screening, such as mammography, is associated with the diagnosis of breast cancer because in their country, mammography is used as a diagnostic rather than a screening tool (Simpson et al., 2015). In addition, they are not keen on performing self-breast examination because they claim that they do not know the techniques, and they are not confident in doing it themselves (Simpson et al., 2015). In addition, Philippine-based women in general are more conservative than women from Western countries and topics, such as cancer and touching one's breast is not openly discussed (Simpson et al., 2015). Such lack of understanding and misconceptions has emanated from lack of education, which is the most likely explanation of why Filipino women do not seek breast cancer

screening when they immigrate to a more advanced countries like the United States where breast screening modalities are highly promoted (Wu & Bancroft, 2006; Sim, Seah, & Tan, 2009), which could lead to less or underutilization of breast screening modalities, such as self-breast examination, clinical breast examination, and mammography. Less or underutilization of available screening modalities could be a factor in not seeking early treatment (Sim et al., 2009). Thus, it could also be a contributory factor to breast health disparities in their adopted countries. Mammography as a mass screening tool is cost prohibitive, thus making it not feasible to implement in most developing countries (Jemal et al., 2011). Clinical breast examination has been recommended in resource-limited countries where the number of new cases of breast cancer is increasing (Jemal et al., 2011). Breast self-examination is cost free, simple, non-invasive screening modality that can be carried out by women themselves. For women from developing countries, breast self-examination is the most reasonable and feasible approach in early detection of breast cancer (Shrivastava, Shrivastava, & Ramasmy, 2013).

Wu and Bancroft (2006) also reported that cancer detection education in the Philippines is just evolving. It was only in the 1990s when cancer screening was emphasized in public health in the Philippines. Previous emphases were on communicable diseases and vaccinations, which were the major public health concerns prior to the 1990s. In fact, it was only in June 2015 that a Filipina lawmaker filed a Bill in

the Philippine Congress to make October of every year the Breast Cancer Awareness month to raise public awareness. If the Bill passes, it will mandate the Philippine Department of Health, Department of Education, and Philippine local governments to work together to create a comprehensive public education and awareness program on the prevention, detection and treatment of breast cancer as an effort to curtail the incidence of the disease in the country (Asia News Monitor, 2015). Currently, there are no existing nationwide breast cancer screening or education programs in the Philippines.

A new trend in educating the Philippine public about early detection and breast cancer prevention has emerged in the recent years. For lack of national guidelines compounded by financial constraints, promoting breast cancer awareness is being carried out by immigrant Filipino women from more advanced countries like the United States through generic advertisements via Philippine television and other media (Wu & Bancroft, 2006).

Problem Statement

In the Philippines, there has been a steady increase in breast cancer incidence rate (Kim, Yoo, & Goodman, 2015). The Philippine Breast Cancer Network (PBCN, 2014) and the Philippine Society of Medical Oncology (PSMO, 2015) reported that the Philippines has the highest breast cancer incidence among Asian nations and the highest increase (589% among 187 countries) from 1980 to 2010.

Given the lack of national breast screening guidelines in the Philippines as of this time, the limited resources and the aggressive type of breast cancer that Filipino women

acquire, the investigator sought to investigate the gaps in the Philippine-based Filipino women's breast cancer knowledge, the relationship between their knowledge and frequency of performing BSE, the predictive ability of their perceptions/health beliefs about breast cancer and breast cancer screening modalities; modifying personal variables; and sources of information about breast cancer and breast screening modalities on their intent to perform BSE, submit to screening mammography, and engage in CBE. With these determinations, the investigator has a better understanding of the educational needs of the Philippine-based Filipino women about breast health. The data were used to form the basis for the future development of an educational platform that is geared to the Philippine-based Filipino women's specific learning needs utilizing cost-effective Web-based technologies, thus improving their breast health practices and potentially reducing poor breast health outcomes and breast health disparity.

Purpose of the Study

The purpose of this study was to investigate gaps in the Philippine-based Filipino women's breast cancer knowledge and determine the relationship between their breast cancer-related knowledge and the frequency by which they perform BSE and examine the predictive ability of their perceptions/health beliefs about breast cancer and breast cancer screening modalities, personal modifying variables, current sources of information about breast cancer and breast cancer screening for their intent to perform BSE, submit to screening mammography, and engage in CBE. A quantitative exploratory method was used to collect data that were used for the investigator to identify issues and gaps that will

direct the development of a cost-effective, Web-based, and technology-driven educational intervention (Wu & Bancroft, 2006). Through education, Philippine-based Filipino women can be empowered with necessary resources and information (Wu & Bancroft, 2006). Such empowerment may encourage Philippine-based Filipino women to actively engage in seeking knowledge about breast cancer and practicing breast screening modalities to potentially reduce poor health outcomes, and reduce health disparities from breast cancer in their country and elsewhere they might find themselves in.

Research Questions and Hypotheses

Research Questions

The research questions sought to identify the following:

1. What is the relationship between the breast cancer related knowledge of Philippine-based Filipino women and their frequency of performing BSE?

2. Are the Philippine-based Filipino women's breast cancer related knowledge, perceptions/beliefs about breast cancer and breast cancer screening modalities, personal modifying factors, and sources of information significant predictors of their intent to perform BSE, submit to mammography, and engage in CBE?

Research Hypotheses

1. H_{A1}. There is a significant relationship between Philippine-based Filipino women's breast cancer related knowledge and their frequency of performing BSE.

2. H_{A2}. Philippine-based Filipino women's breast cancer related knowledge, perceptions /beliefs about breast cancer and breast cancer screening modalities, personal modifying factors, and sources of information are significant predictors of their intent to

perform BSE, submit to screening mammography, and engage in CBE within the next year.

Significance of the Study

Nursing Education

The results and findings of this study may be used to shed light for future development of a Web-based, culturally and linguistically sensitive, cost effective, and accessible educational programs and teaching-learning strategies about breast cancer risks and benefits of screening examinations to empower Philippine-based Filipino women, specifically and women in limited-resource countries across the globe to engage in breast cancer screening activities in an effort to improve breast cancer outcomes.

Nursing Practice

The findings of this study can potentially increase the awareness of nurses about cultural variations so that they can provide culturally and linguistically appropriate breast health education to Filipino women who they might encounter as clients in any health care setting. In addition, the results and findings of this study may also interest nurses in practice to explore teachings strategies to promote breast cancer awareness and utilization of breast cancer screening available in their respective localities.

Nursing Research

This investigator has contributed to a limited body of research about Philippine-based Filipino women's breast-cancer-related knowledge, breast cancer screening behaviors, health beliefs, and associated variables that motivate women to engage in breast cancer screening (Secginli & Nahcivan, 2006). Results of this study will also present baseline data that will form the basis for further studies. In addition, this

investigator utilized social media as a method for recruiting participants and providing the study link.

Public Policy

Results of the study present initial data for the first time about the Philippine-based Filipino women's breast-cancer-related knowledge, perceptions/health beliefs, and their intent to participate in breast cancer screening activities. These findings can be used by the Philippine government for health policy to move forward the development of either regional or national breast screening guidelines and breast health educational programs for Philippine-based Filipino women. Additionally, policy guidelines can be developed to empower community health nurses who served Filipino women in marginalized Philippine communities to play an expanded role in breast cancer care (e.g. training and performing CBE).

Philosophical Underpinnings

The philosophical thought that underpinned this dissertation study was post-positivism, which is defined as the search for "warranted assertability" as opposed to truth (Lather, 1990; Phillips, 1990). Post-positivism has an assertion that truth can be conceptualized in many different ways (Clark, 1998). Karl Popper, Jacob Bronowski, Thomas Kuhn, and Charles Hanson were the proponents of post-positivism (Clark, 1998). They recognized that positivism is no longer a viable and defensible option (Crossan, 2003). Post-positivists epistemological belief is that there is no best approach in developing human knowledge. It acknowledges the fallibility of all measurements and emphasizes the importance of multiple measures and observations (Houghton, Hunter, & Meskell, 2012). From the realist perspective, unobservable phenomena are considered to

exist and have the capability that can be used in explaining observable phenomena (Bronowski, 1956; Popper, 1959; Kuhn, 1962).

From the ontological view, post-positivists believe that reality can be known only imperfectly and probabilistically (Denzin & Lincoln, 2000) and that the outcomes of an investigation are an estimation of the truth rather than the truth itself (Popper, 1992). With post-positivism, reality is created by those individuals who are involved in the research, and its construction is influenced by gender, culture, and cultural beliefs (Crossan, 2003). Crossan (2003) succinctly summarized that there is an assumption that post-positivism that reality is multiple, subjective, and mentally constructed by the individual.

This investigator utilized McCance Breast Cancer Knowledge Test (BCKT; McCance, Mooney, Smith, & Field, 1990), Champion's Revised Susceptibility, Benefits and Barriers Scale for Mammography (RSBBSM; Champion,1999), and the perceived barriers to CBE section of Sunil et al.'s (2014) study. The instruments underwent reliability and validity testing, respectively. Champion's health belief model (HBM) scale underwent three revisions with the third one done in 1999 (Champion, 1999). Questions for perceived barriers to CBE were taken from the work of Sunil et al. (2014). Post-positivism has a requirement for precision, logical reasoning, and attention to details (Clark, 1998), hence the use of validated research instruments. Evidence was inferred from self-reports (Bronowski, 1956) that were provided by the Philippine-based Filipino women as they responded to the survey questionnaires.

In the spirit of post-positivism, the investigator acknowledged that the findings from this dissertation study cannot be generalized to all cases and situations. The findings

were viewed contextually and its application will be through induction with reference to probability of similar cases elsewhere (Clark, 1998).

Theoretical Framework

The health belief model was the theoretical framework that guided the investigator in examining the variables of level of knowledge, frequency of performing BSE, perceptions/health beliefs about breast cancer and breast cancer screening modalities, personal modifying factors, current sources of information, and preferred educational platform of Philippine-based Filipino women.

The HBM is both a psychosocial model and a behavioral model (Champion, 1993) and a behavior theory (McEwen & Willis, 2014). It is frequently used to explain health behaviors based on the concepts of susceptibility, seriousness, barriers, benefits, health motivation, and confidence (Hayden, 2014). The model is useful in identifying factors that are associated with women's breast cancer beliefs and screening behaviors (Champion, 1994; Hall, Hall, Pfriemer, Wimberley, & Jones, 2007; Rosenstock, 1965; Parsa et al., 2008; Secginli & Nachivan, 2005).

The original constructs were as follows:

1. Perceived personal vulnerability to or subjective risk of a health condition (susceptibility), which is the perceived beliefs of personal threat or harm related to a health condition. When people perceived greater risk of acquiring a disease, they tended to engage in activities that will reduce their risk (Champion, 1999). However, the opposite can also happen. If the perception of risk is low, people tended to engage in unhealthy or risky behaviors.

2. Perceived seriousness. This construct refers to perceived degree of personal threat related to a health condition. If the person perceives threat to a serious health condition for which there is the presence of a real risk, the person's behavior changes (Hayden, 2014). When both perceived susceptibility and perceived seriousness are present, it results in perceived threat (Stretcher & Rosenstock, 1997).

3. Perceived positive attributes of an action (benefits). This construct is the perceived positive outcomes of changing behavior to decrease the risk of developing the disease, which is usually the personal opinion of an individual about the value or usefulness of the new behavior. This construct has an important role in the adoption of secondary behavior, such as screening.

4. Perceived negative aspects related to an action (barriers). This construct is the person's view of the hindrances that will prevent the person from adopting a new behavior. To adopt the new behavior, the person needs to believe that the benefits of the new behavior outweigh the consequences of continuing the old behavior (Centers for Disease Control and Prevention, 2004). Oftentimes, perceive barriers are most significant in determining behavior change than perceived susceptibility, seriousness, and perceived barriers (Janz & Becker, 1984). The four major constructs of perceptions can be modified by variables, such as culture, education level, past experiences, and motivation. Past experience of a previous illness can increase a person's susceptibility for that illness and will be aware of factors that lead to the development of the disease (Hayden, 2014). On the other hand, the past experience can decrease the person's perception to that disease if the illness was easily treated and there were no untoward consequences of the disease. In addition, the construct of cues to action also influenced behavior. These are the factors

that will lead the person to the path of change behavior, which could take the form of personal or family member's illness, advice from health care providers, mass media campaigns, incentives, and TV ads (Hayden, 2014).

The HBM model has undergone several modifications and revisions, resulting to additional constructs of health motivation (Champion, 1999) and confidence, which was equated with Bandura's self-efficacy construct (Rosenstock, Strecher, & Becker, 1988). The construct of self-efficacy is the belief that one can successfully execute or do something. The implication of this construct is that individual does not engage in doing something new if the individual thinks that he or she cannot do it properly. Health motivation refers to the beliefs and behaviors related to the state of general concern about health (Champion, 1999). In addition, the benefits of mammography and barriers to mammography were added in the 1999 revision along with revising the susceptibility subscale (Champion, 1999).

Based on this model, one can hypothesized that if a woman knows about breast cancer and her associated risks, it will influence on how that woman will perceive her susceptibility and seriousness of the disease. Likewise, if a woman decides to participate in breast screening activities, it stems from her beliefs that certain behaviors will benefit her, and she will try to surpass any barrier (Hall et al., 2007).

The following are examples of breast cancer studies in which the health belief model was used as the theoretical framework. Sunil et al. (2014) studied women living in colonias along the Texas-Mexico border and found that the women had higher levels of perceived susceptibility to cancer, lower levels of perceived severity of breast cancer, but reported higher levels of overall benefits of early screening. The respondents of the study

indicated moderate to higher levels of perceived barriers to clinical breast examination and mammography. Secginli and Nachivan (2005) showed that those who performed BSE perceived higher susceptibility to breast cancer, fewer barriers, and were more confident than those who did not perform BSE. Further, the researchers showed that perceived seriousness, perceived benefits, and health motivation were not significantly associated with BSE performance (Secginli & Nachivan, 2005). In terms of use of mammography, perceived barriers and health motivation were not found to be significant. Perceived higher seriousness, higher benefits, higher motivation, and fewer barriers were found to be significantly associated with women who used mammography in the study samples. Hall et al. (2007) also anchored their study by using HBM. Results of the study showed reduction of specific beliefs, such as fear of physical discomfort or pain, perceived inability to remember appointments, and fear of diagnostic results that were perceived as barriers to participation in breast cancer screening. Kara and Acikel (2009) use HBM to study the health beliefs and breast self-examination practices of Turkish nursing students and their mothers. Compared with their daughters, mothers who perform BSE less frequently reported higher barriers, lower motivation, and lower perceived benefits of BSE. These findings are aligned with the HBM model (Kara & Acikel, 2009).

Theoretical Assumptions

The main essence of the health belief model is that personal beliefs influence health behavior (Hayden, 2014). Health-seeking behavior is influenced by a person's perception of a threat that is posed by a health problem and the value that a person associates with actions that will reduce the health threat (Polit & Beck, 2012). The assumptions of the theory are the following:

1. It assumes that people are rational in their thoughts and actions and will take the best health promoting action to reduce the threat to their health.

2. Change in health behavior is affected by the person's perception of threat from the disease and perceived benefits from preventative action.

3. A person's perception of a health threat is influenced by the person's perception of susceptibility to a disease, perception of the seriousness of the diseases, and cues to action.

4. Certain modifying factors, such as age, sex, intelligence, and personality, affect the person's perceptions of susceptibility, perceived seriousness, perceived threat of a disease, and perceived benefits and barriers of adopting new health behavior (Hayden, 2014).

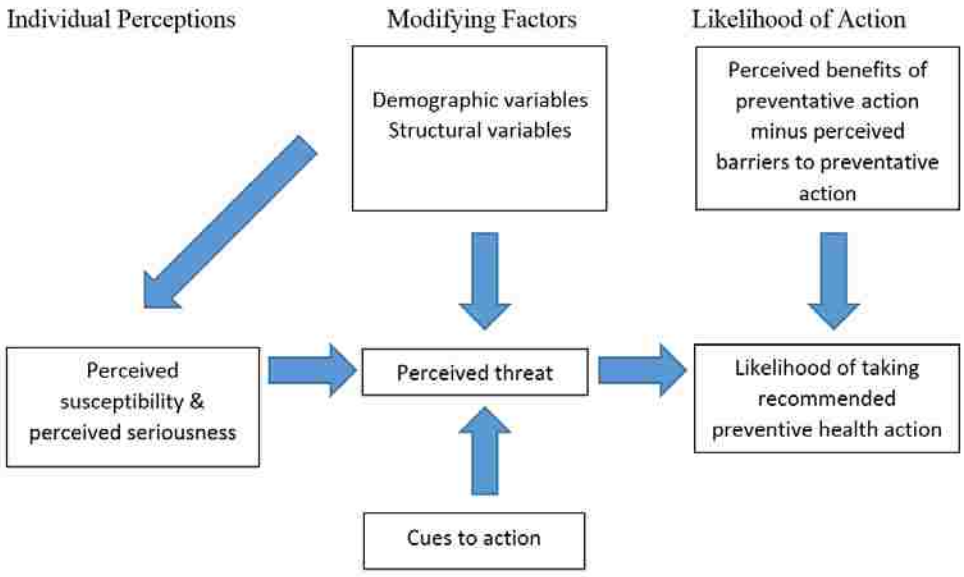

Figure 1. The health belief model. Adapted from *Fundamentals of Nursing: Human and Health Function* (8th ed., p. 230), by R. Craven, C. Hirnle, and C. M. Henshaw, 2017, Philadelphia, PA: Wolters/Kluwer. Copyright 2017 by Wolters/Kluwer.

HBM is known as value-expectancy behavior that is fundamentally based on the premise that an individual's desire to avoid illness, coupled with a belief that a particular health action, would avert the onset of the illness and can be interpreted and explained in relation to a number of diseases (Rosenstock, 1974).

In the context of Philippine-based Filipino women, the investigator assumed that they have differing levels of breast-cancer-related knowledge and different perceptions (health beliefs) about breast cancer and breast cancer screening modalities. The respondents also differed in their personal modifying factors (or demographics which in the dissertation study includes age, educational and income levels, marital status, place of residence, and family history of breast cancer) and sources of information on breast health. These variables interact and influence each other to a certain extent. These interactions are thought to shape the Philippine-based Filipino women's intent to perform BSE, submit to screening mammography, and engage in CBE. The relationships of the variables in this dissertation study are schematically depicted in the conceptual model below.

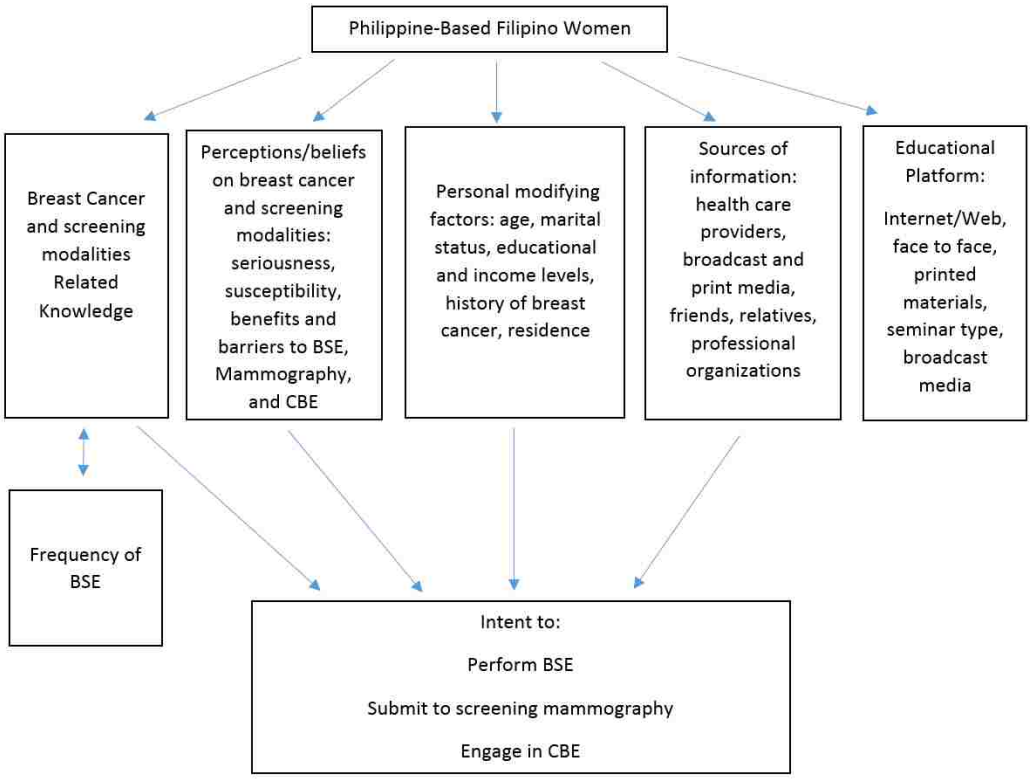

Figure 2. Conceptual framework. Adapted from *Fundamentals of Nursing: Human and Health Function* (8th ed., p. 23), by R. Craven, C. Hirnle, and C. M. Henshaw, 2017, Philadelphia, PA: Wolters/Kluwer. Copyright 2017 by Wolters/Kluwer.

Definition of Terms

The Construct

Theoretical definitions. The variables used in the dissertation study were theoretically defined as follows:

- Knowledge of breast cancer was theoretically defined as the respondents' knowledge of general information about breast cancer and breast cancer screening modalities (McCance et al., 1990).
- Frequency of performing BSE is the number of times an individual examines her breast.

- Perceptions/beliefs are the individuals' beliefs about their susceptibility to a certain illness, the seriousness of the illness, and how threatening the illness is to them. Health beliefs are also the individuals' perceptions of the benefits and barriers of taking preventative action as well as their motivation, self-efficacy, and cues to actions (Champion, 1999).
- Personal modifying factors that translate to demographic factors that influence one's perceptions (Hayden, 2014).
- Sources of information are places, persons, or things from which individuals currently obtain information about breast cancer and breast cancer screening modalities.
- Preferred educational platforms are those learning strategies through which individuals will obtain information about breast cancer and breast cancer screening modalities in the future.
- Personal intention are the individual's resolve or determination to do something about her breast health.
- Philippine-based Filipino women is theoretically defined as those Filipino women living in the Philippines and is the target population of this study.

Operational definitions. The following are the operational definitions of the variables used in this dissertation study:

- Knowledge of breast cancer is operationally defined as the scores obtained by the participants with the McCance Breast Cancer Knowledge Test. The BCKT, which contains 19 multiple choice questions, measures a respondent's knowledge about detection and screening practices for breast cancer. One

point was given if the respondent gave the correct answer to a specific question; zero if the respondent provided incorrect answer or chose “I don’t know” as an answer to a particular question. The number of correct answers were summed up to create a BCKT index. Scores of 19 to 16 were designated as high level knowledge; scores 15 to 10 as moderate level; and score of 9 to zero was designated as low-level knowledge.

- Frequency of performing BSE is the number of times the respondent examines her breast. To collect data for this parameter, the respondents answered a multiple choice question. Correct response was given a score of 1 and zero was given for incorrect answer and “I don’t know” option.
- Perceptions/beliefs were the scores of the respondents on the subscales of susceptibility, seriousness, benefits and barriers to BSE, and benefits and barriers to mammography (Champion, 1993) from Champion’s RSBBSM and scores from Sunil et al.’s benefits and barriers to CBE. The respondents responded to the 6 subscales using the following nominal scale: 1 *strongly disagree*, 2 *disagree*, 3 *neutral*, 4 *agree*, and 5 *strongly agree.* A scale was created by summing up the questionnaire responses for each subscale. The subscale Perceived Susceptibility and Perceived benefits to mammography, each with five items may have 0 to 20 range. A greater score represents greater susceptibility to breast cancer and high advantage of mammography. The subscale for perceived severity with seven items may have a range of score 0 to 28, whereas a higher score may be interpreted as breast cancer being perceived as serious. The subscale Perceived Benefits and Perceived

Barriers of BSE has six items, and each and can have range score of 0 to 24 and that higher score would mean greater advantage of BSE and high barrier to BSE. Both the subscale of confidence and perceived barriers to mammography has 11 items each, and both can have score range from 0 to 44. Higher score for confidence will be associated with higher degree of confidence in performing BSE, whereas high score for barriers high barrier to BSE. The perceived barrier to clinical breast examination has 14 items and score may range from 0 to 64. A high score may be interpreted as high barrier to CBE.

- Personal modifying factors referred to the demographic description of the Philippine-based Filipino women, which included age, educational level, income, marital status, place of residence, and family history of breast cancer. Information for which these variables were collected in Part 1 of the survey questionnaire, whereas the participants were asked to check options related to their circumstance.
- Sources of information were operationally defined as individuals or sources from which the respondents currently obtain information about breast health, which included health care providers, print materials, family members, relatives, friends, and Internet sources. The data for this information was collected by asking the respondents to select from the list provided in the questionnaire.
- Preferred educational platform is the teaching strategies from which the respondents would like to use to obtain information about breast cancer and

breast cancer screening modalities in the future. This preferred educational platform includes doctor, nurse, barangay health care worker/midwife, friends, relatives, Internet, TV, radio, printed materials, professional organization, and others that the respondents wished to include in their responses. The respondents selected options from the list provided in the questionnaire.

- Philippine-based Filipino women, in this dissertation study were defined as those Filipino women age 20 years old and above, living in the Philippines, and are the respondents of the study.

Chapter Summary

Breast cancer still remains as the leading cause of death among women around the world. Compared with other ethnic groups, Philippine-based Filipino women may have lower incidence of breast cancer, but when they do contract the disease they tend to acquire the aggressive types and most likely will die from it. The Philippines is a resource-limited country that has no national guidelines for breast cancer screening as of this time. This investigator explored the Philippine-based Filipino women's breast cancer and breast-cancer-screening-related knowledge, perceptions/health about breast cancer and breast cancer screening modalities, their personal modifying factors, their current sources of breast health information, and their preferred educational platform about breast health. Findings of this study enabled The investigator was able to better understand their educational needs with the findings of the study, which formed the basis for future development of a cost-effective and Web-based educational platform about breast cancer and breast cancer screening modalities geared toward the specific educational needs of

the respondents. Post-positivism is the philosophical underpinning and the health belief model presented the theoretical framework of this study.

Chapter 2

Literature Review

This chapter presents literature that are related to major concepts and variables being examined in this study. It examined studies published in PubMed, CINHAL, Google scholar, Medline, and ResearchGate from 2000 to 2016. Breast cancer, Filipino women, Philippines, health belief model, breast screening were the key words used to search for relevant articles. Literature selected were from the last 5 years; however, older literature were also used for lack of current publications, especially studies conducted in the Philippines. In addition, there is a small number of studies conducted in the United States and other Western nations that involved Filipino migrant women as participants.

Breast Cancer

Despite advancement in medical technology, breast cancer remains the most common malignancy in women worldwide (Azim & Ibrahim, 2015; Dulanas, 2016).

Breast cancer begins as a single transformed cell that grows and multiplies in the epithelial cells lining of one or more of the mammary ducts or lobules. It is a heterogeneous disease, having many forms with different clinical presentations and responses to therapy (Weigel & Dowset, 2010). Some cancers will present as a palpable lump on the breast while others will show up only on a mammogram.

There are two broad categories of breast cancer: invasive and non-invasive. About 20% are noninvasive; the remaining 80% are invasive. As long as the cancer remains in

the duct, it is noninvasive. The cancer is classified as invasive when it penetrates the tissue surrounding the duct. Most of these cancers arise from the intermediate ducts. Metastasis occurs when cancer cells leave the breast via the blood and lymph systems, which permit the spread of these cells to distant sites. The most common metastatic sites for breast cancer are the bones, lungs, brain, and liver. The course of metastatic breast cancer is related to the site affected and to the function impaired (Ignatavicius & Workman, 2013).

Categories of Breast Cancer

Non-invasive types. Ductal carcinoma in situ (DCIS) is an early noninvasive form of breast cancer. In DCIS, cancer cells are located within the duct and has not invaded the surrounding fatty breast tissue. The number of women who were diagnosed with DCIS increased because of mammography. It does not metastasize at this stage but can become invasive breast cancer if left untreated. However, there is no way of finding out which DCIS will become invasive and which one will not.

Lobular carcinoma in situ (LCIS) is a rare cancer type. It is usually identified during biopsy for another problem. Having an LCIS, increases a woman's risk for developing a separate breast cancer later. Traditional treatment for this type of cancer was close observation. There is new evidence that many LCIS lesions will progress to invasive cancer and should be treated with surgical excision (Cangiarella et al., 2008).

Invasive types. Infiltrating ductal carcinoma is the most common type of invasive breast cancer. The disease originates in the mammary ducts and grows in the epithelial cells lining these ducts. Once invasive, the cancer grows into the tissue around it in an irregular pattern. If a lump is present, it is felt as an irregular, poorly defined mass. As the

tumor continuous to grow, fibrosis develops around the cancer. This fibrosis may cause shortening of Cooper's ligaments and the resulting typical skin dimpling that is seen with more advance disease. Another sign that may indicate late-stage breast cancer is peau d'orange.

Inflammatory breast cancer disease is rare, but it is a highly aggressive form of invasive breast cancer. Symptoms include swelling, skin redness, and pain in the breasts. Inflammatory breast cancer (IBC) seldom present as a palpable mass and may not show up on a mammogram. It is usually diagnosed at a later stage and is often harder to treat successfully (American Cancer Society [ACS], 2010).

Breast Cancer Subtypes

This way is a way of classifying breast cancer according to the similarities in their gene-expression profile (Foulkes, Smith, & Reis-Filho, 2010). Medullary breast cancer, so called because of its close resemblance to the brain, which is soft and fleshy. It is more common in women who have BRCA1 mutation and can occur at any age but usually affects women in their late 40s and early 60s and is more common in Japan than in the United States (US). Medullary breast cancer is a rare subtype of invasive ductal carcinoma (Griggs & Hudis, 2016).

BRCA1-related breast cancer occurs in women who carry a deleterious germline mutation in the breast cancer susceptibility gene BRCA1. Triple negative breast cancer, which made its appearance in medical literature only in 2006, is characterized by negative estrogen receptor, progesterone receptor, and human epidermal growth factor receptor (HER2) expression. HER2 is said to be amplified in 15% to 20% of breast cancers (Foulkes et al. 2010). Basal-like breast cancer is characterized by absence or low

levels of expression of estrogen receptors, very low prevalence of HER2 overexpression, and expression of genes that are usually found in the basal or myoepithelial cells of the human breasts. Both triple negative and basal-like are usually high grade invasive ductal carcinomas (Foulkes et al. 2010).

Breast Cancer Types Affecting Women in General

Utilizing the data from 13 Surveillance, Epidemiology and End Results (SEER) databases in the US from January 1, 1993, to December 31, 2002. Redaniel et al. (2010) performed an analysis that showed that Caucasians and Filipino-American women residing in the States had higher incidence of lobular than ductal breast cancer. Japanese, Korean, Hong Kong, Israeli Jews, Malaysian, and Singaporean Chinese women were mostly found to have estrogen positive (ER+) subtype of breast cancer. Malay and Indians living in Malaysia and Singapore had a relatively smaller proportion of ER+ cancer. About half of Indonesian women were diagnosed with ER+ breast cancer (Kim et al., 2015). ER (+) and positive progesterone (PR+) subtype of breast cancer were observed in Indian and Mainland Chinese women. In Kuwaiti women, the estrogen negative type predominates (Kim et al., 2015). Ductal carcinomas are the most common type seen in Egyptian women (Ahmed, Osman, & Abo Elmatti, 2014). Triple negative and basal-like breast cancers commonly afflicts young Black and Hispanic women compared with young women of other racial or ethnic groups (Foulkes et al. 2010).

Filipino women. Redaniel et al. (2010) analyzed the data of all invasive breast cancers from 1993 to 2002 from the Philippine Society-Manila Cancer Registry (PCS-MCR) and from the Department of Health-Rizal Cancer Registry (DOH-RCR). The results of the analysis showed that Filipino women living in the Philippines have the

highest proportion of ductal cancers and lowest proportion of lobular cancers. In addition, Philippines is one of the less developed Asian countries in which there is high number of "unknown" stage of breast cancer at the time of diagnosis (Kim et al., 2015).

Risk Factors for Breast Cancer

The literature showed that the etiology of breast cancer is multifactorial and that there is significant interactions between endogenous (genetics and hormonal) and exogenous factors (environmental; Ahmed et al., 2014; Shrivasta et al., 2013). Age, parity, practice of late initiation of breastfeeding, oral contraceptives and hormone replacement therapy, high dietary fat, excessive alcohol consumption, positive family history, age at menarche, menopausal status, age at first live birth, genetic mutations and benign breast disease were risk factors cited in literature that are implicated in breast cancer development (Shrivasta et al. (2013).

Age

The chances of contracting breast cancer increase with advancing age (Dulanas, 2015) and an upward trend of its incidence rate starts at age 30 (Laudico et al., 2010). The median age of Asian women at the time of diagnosis with breast cancer is 49 years to 50 years old and are 6 years to18 years younger at breast cancer diagnosis than non-Hispanic. The explanation put forth for this is age-specific-period cohort effect in the rapid changes in breast cancer profiles allied with westernized lifestyle (Kim et al., 2015).

According to Assi et al. (2013), breast cancer among young women is more likely to be that of the aggressive type like triple-negative or HER2 positive breast cancer. Breast cancers that do not have an estrogen receptor (ER), progesterone receptor (PR), or HER2 expression are referred to as triple-negative breast cancer. This type is a type of

invasive breast cancer that occur more often in young Black and Hispanic women and has a relatively poor outcome (Foulkes et al., 2010). Further, the cancer is more likely to present at an advanced stage, which is attributed to the following: the cancer is of the biological aggressive subtype, the individual has low index of suspicion, and delayed diagnosis (Assi et al., 2013).

Filipino women were diagnosed at a younger age of around 53 years old compared with 55 years of age and 58 years old for their Asian and Caucasians counterparts, respectively (Simpson et al., 2015). Increase in age-specific breast cancer incidence rate in the Philippines is identical to the pattern that is observed in western countries. This pattern reflects the earlier westernization of the country as compared with other Asian countries (Kim et al., 2015). Gibson et al. (2010) noted that incidence was particularly high among women in younger age groups living in Manila. The observed high rate of breast cancer among young Filipino women was unexpected (Gibson et al., 2010).

Educational Level

Gibson et al. (2010) designed a case-control study of educational level of the participants that was used as proxy for socio-economic status (SES). When used in this manner, educational level was found to be significant predictor of risk for breast cancer. The cases in the intervention cohort were more educated than those who were in the control group. The findings showed that the risk for those who reached the tertiary level doubled compared with those who had less education. It is also interesting to note that the risk also increased for those who pursued education after 13 years of age (Gibson et al., 2010), which may be explained by saying that the more educated women are, the most

likelihood that they will engage in breast screening methods (Ramathuba, Ratshirumbi, & Mashamba, 2015) and subject themselves to medical treatment. This was also confirmed by Kim et al. (2014) who found that the educational level of Filipino, Japanese, Chinese, Mongolians, Vietnamese, and Cambodian immigrant women in Korea was found to be an important predictor for mammography compliance

Income

Poverty is associated with poorer breast cancer outcome worldwide (Ramathuba et al., 2015). In countries with advance economy, the risk for breast cancer increases with early menarche, late menopause, low parity, and delayed first pregnancy (MacMahon, 2006). The rate of breast cancer is high among women from high-income Asian countries due to the increasing adoption of Western lifestyle (Sankaranayaranan, Ramadas, & Qiao, 2014). Asian countries like Korea, Taiwan, and Singapore experienced a rapid societal change due to rapid economic development in the past 30 years. This improvement in the economic status increased the standard of living of the people (Gibson et al., 2010) and has led to a variety of lifestyle and dietary practices that may affect breast cancer risks and health seeking behavior (Ramathuba et al., 2015). On the other hand, Kim et al. (2014) found that Asian immigrant women in Korea who had less than 2,000,000 Korean won per month had significantly lower score on the perceived benefits of mammography.

It is not the case in the Philippines. It did not experience the same economic boom like the other Asian countries, so the increase in breast cancer incidence rate in the country is not supported by an improved economy (Gibson et al., 2010). The income of

Filipino women was not associated with breast cancer risk as Gibson et al. (2010) found in their study.

Family/Personal History of Breast Cancer

Having relatives with breast cancer increase a woman's risk for developing the disease. This risk increases twofold for a woman who has a mother, sister, or daughter with the disease (ACS, 2016).

The relationship between genetic factors, such as polymorphism, family history and BRAC mutation, and breast cancer risk among Asian women had been studied. In a replication study for 70 single polymorphism (SNPs), only half of the 67 independent breast cancer susceptibility loci genetic risk variants were initially reported in White females that were associated with breast cancer risk in the East Asian population (Zheng et al., 2013). Results from small case-controlled studies showed gene-environment interactions for breast cancer risk among Asian women. Genetics may vary among Asian subgroup populations living in geographically isolated areas (Kim et al., 2015).

Gibson et al. (2010) found that 2% of the 138,392 Filipino women in the interventional cohort reported a positive history of either breast or ovarian cancer. However, only 28 women reported previous benign breast cancer restricting evaluation of its ability to predict breast cancer risk (Gibson et al., 2010).

Place of Residence

Azim and Ibrahim (2014) compared breast cancer incidence between rural and urban China and Egypt. The result showed that there is a higher increase of breast cancer incidence in urban places in both countries among women 45 years old and above. The same observation is seen in the registries of rural Barshi and the city of Mumbai. The

urban population in developing countries might have more exposure to xenoestrogens, which is linked to the development of hormone positive breast cancer (Brody et al., 2007). Gomez et al. (2010) found a there may be a strong environmental cancer risk in U.S.-born Filipino women.

Race/Ethnicity

Female breast cancer incidence rates vary substantially by race or ethnicity. In the United States from 2006 to 2010, non-Hispanic White women had the highest incidence rate, and lowest incidence rate came from the Asian/Pacific Islander group (DeSantis, Ma, Bryan, & Jemal, 2014). Gomez et al. (2010) reported that 21,147 women from six Asian ethnic groups taken from population-based California Cancer Registry Records from 1988 to 2004 were diagnosed with primary invasive breast cancer of which 35.9% (7,583) were Filipina women, followed by Chinese women with 27.1% (5,732), Japanese women 18.4% (3,888), Vietnamese women with 7.1% (1510), Korean women with 6.2% (1,304), and the remaining 5.3% (1,130) represented women from other Southeast Asian countries. Among Hawaiian population, Filipino women have high breast cancer mortality rate compared with the other Asian Americans living in the state although they do not have the highest incidence (Ho et al., 2010). A little over 34% of Filipino women present late stage of breast cancer at the time of diagnosis compared with 29% of Chinese and 22.4% of Japanese women (Ho et al., 2010).

Breast Cancer Statistics

The incidence of breast cancer is 1.67 million worldwide, which is supported by DeSantis et al. (2014) who reported that breast cancer is the second leading cause of cancer death among women.

United States and Asian Statistics

In the United States, 232, 340 was the estimated number of new cases of invasive breast cancer while the estimated number of deaths from breast cancer was 39,620 by 2013. In terms of age, 79% of new cases and 88% of cancer deaths were projected to be among U.S. women aged 50 years and older. In situ breast cancer was projected to be about 64,640 new cases in 2013 (De Santis et al., 2014).

Kim et al. (2015) reported that in 2012, Asia had 651,000 number of women with incident breast cancer (38.8% of all cases globally), followed by Europe with 27.7% of all cases, and North America with a 15.3% of all cases. Historically, Asian countries have low incidence of breast cancer compared with Western countries. These findings are in contrast to the previous reports, wherein breast cancer incidence has been highest in Northern America, Western and Northern Europe, and Australia/New Zealand with rates ranging from 85.8% to 96%.

The Asian average rate was 29.1%, which is about one quarter to one third of the rates in the traditionally high risk countries (Kim et al., 2015). While breast cancer rates in the United States and England have stabilized, Asia has a sharp increase in its breast cancer incidence rates (Shin et al., 2010). The cause of the increase rate was thought to be due to economic development and adaptation of “westernized” lifestyle (Kim et al., 2015). Asian countries, however, differ in the magnitude and type of changes in breast cancer risk factors. For example, in the years between 1993 and 2002, South Korean women had an increase of 44.9%, 24.2% among Singaporean women, and Filipino women had 5.2% increase based on the age standardized rate (ASIR). These findings have shown that Asian women should not be considered as a homogenous group (Kim et

al., 2015). Assi et al. (2013) cited a report in Globocon 2008 that more than 146, 660 new cases of breast cancer have been diagnosed in women less than 40 years of age worldwide, and 77% of these are from developing countries. Mortality rates from breast cancer in all age groups had been declining since the late 1990s in Australia, Denmark, United States, and United Kingdom (UK; Kim et al., 2015).

Philippine Breast Cancer Statistics

The Philippines has seen steady increase in breast cancer incidence rate (Kim et al., 2015). Gibson et al. (2010) noted from the Manila Cancer Registry data that breast cancer incidence among Filipino women was exceptionally high compared with other Asian populations. There was no direct explanation to the high incidence of breast cancer in Manila. It can only be inferred that the increasing trend is associated with changes in lifestyle that occurred in urban Manila since the 1960s (Gibson et al., 2010). The Philippine Breast Cancer Network (2014) and The Philippine Society of Medical Oncology (2015) stated that the Philippines has the highest breast cancer incidence among Asian nations. It has the highest increase of about 589% among 187 countries from 1980 to 2010. The Philippine Department of Health and the Philippine Cancer Society (PCS) reported that 16% of 80,000 new cases of cancer is attributed to breast cancer (Tubianosa, 2015). It is further reported that one out of 13 Filipino women will develop breast cancer in her lifetime (PBCN, 2014; PSMO, 2015) and one out of 100 will die before age 75 (PSMO, 2013). Gibson et al. (2010) reported that from 1993 to 1997, age-adjusted incidence of breast cancer in Filipino women was 55.1 per 100,000, which was similar to the 52.0 per 100,000 rate seen in UK from 1983 to 1987, which was prior to the introduction of breast cancer screening in the country. The world’s age

standardized rate (ASR) incidence was truncated at 74 (Gibson et al., 2010). Age-standardized rates is a measure of a rate that a population would have if it had a standard age structure (Lauby-Secretan et al., 2015). Age standardization is important because it has powerful influence on the risk of cancer, especially when several populations are being compared (Dulanas, 2016). In 2012, developing countries like the Philippines had seen an increase of 12% ASR or 47 per 100,000 women, compared from 10 years ago (Trieu, Mello-Tomas, & Brennan, 2015). Gomez et al. (2010) found that breast cancer rates for U.S.-born Filipino women exceeded those for non-Hispanic White women. In particular, the researchers found that among premenopausal and perimenopausal women, Filipino women breast cancer rates were higher than those of non-Hispanic White women (Gomez et al., 2010).

In terms of mortality from breast cancer, Filipino women experienced a sharp increase of rate from 1995 through 2009 (Kim et al., 2015). This finding is corroborated by the 2008 Pfizer report that the Philippines has the highest breast cancer mortality rate and low survival rate from breast cancer (Pfizer Facts, 2008). The five-year relative survival rate for breast cancer in the Philippines was reported as 58% to 59%. This rate is low compared with Hong Kong, Tainjin, Korea, and Japan, and with more than 80% survival rate, there is Shanghai, Singapore, Izmir with 75% to 80% survival rate, Israel (Jews) 71% while Thailand, Israel (non-Jews), Jordan, and Saudi Arabia has 60% to 65% relative survival rate (Kim et al., 2015).

Breast Cancer Screening Modalities

Screening is the systematic application of a screening test in a presumably asymptomatic population for the purpose of identifying individuals with an abnormality

suggestive of cancer (Philippine Council for Health and Research Development [PCHRD], 2015). Breast self-examination, clinical breast examination, and mammography are the three existing breast cancer screening modalities (Ahmed et al., 2014; Edgar, Glackin, Hughes, & Rogers, 2013; Kayode, Akande, & Osagbemi, 2005, but women's participation and positive attitude are necessary and important for these screening modalities to be effective (Chan, 2007).

Breast Self-Examination

U.S. and Asian countries. This modality showed lack of evidence in improving breast cancer mortality rates (Mahony et al., 2014; Smith et al., 2006). Nevertheless, the American College of Obstetricians and Gynecologists (Newton, 2016), The World Health Organization (WHO, 2014), and Smith et al. (2006) recommend BSE as a means of increasing breast self-awareness among women. It is also true that despite advancement in screening technologies, 90% of breast cases are discovered by women themselves, which makes BSE a good tool to learn the topography of one's breast (Kayode et al., 2005). In the 2016, updated breast screening guidelines from the U.S. Preventive Services Task Force (USPSTF) included a recommendation that clinicians are no longer required to teach BSE to women. The recommendation was based on studies in which teaching BSE did not reduce breast cancer mortality but resulted in added imaging and biopsies (Newton, 2016). Health care workers in Malaysian health clinics are no longer teaching BSE. However, BSE is encourage as part of breast awareness program and is made available upon request. In lieu of BSE, Malaysian women are taught to *Look* for any breast changes, *Feel* for any lump, and *Response* to the change by reporting to the nearest clinic (Dahlui, Ramli, & Bulgiba, 2011). ~~In the 2006 study conducted by~~ Wu, West,

Chen, and Hergert (2006) found that among women of Asian descent in three counties in Southeastern Michigan that 51% (n = 47) Filipino American women participants performed BSE, according to the recommendation by ACS. Compliance with ACS recommendations was found to be associated with the length of stay of these women in the US. Longer residency would mean more exposure to ACS recommendations (Wu et al., 2006).

Philippines. The Philippine Cancer Society (2014) still recommends and encourages Filipino women to perform self-breast examination once a month, starting at 25 years of age and to continue until the post-menopausal period. For premenopausal women, the recommendation to perform breast self-exam is 5 to 7 days after menstruation and for postmenopausal women at the end of each month (PCS, 2014). The Philippine Department of Health (2000) conducted a survey and showed that most women from urban areas perform BSE compared with women from rural areas. The Philippine government continues to campaign for monthly BSE until such time that mammography becomes available and affordable for the target population (Ngelangel & Wang, 2002).

Mammography

U.S. and Asian countries. In the 1980s, the United States had a rapid increase in the incidence rate of breast cancer, which was attributed to the increase use of mammography screening (DeSantis et al., 2014). This widespread uptake of mammography screening led to an inflated incidence rate of breast cancer because they are being diagnosed 1 to 3 years earlier than before. In addition, screening mammography also led to detection of indolent breast cancer (DeSantis et al., 2014). However, between

2002 and 2003, the incidence rate declined sharply, which may be partly due to a decline in mammography screening and decrease use of menopausal hormones (DeSantis et al., 2014). The World Health Organization (2016) stated that population-based mammography screening programs can reduce the breast cancer mortality by 25%. The recently published screening guidelines by the U.S. Preventive Services Task Force recommend biennial screening mammography for women aged 50 to 74 years of age. For women aged 40 to 49 years old, screening mammography is not required. However, if regular biennial screening mammography is to be started before 50 years of age, it should be individualized and should take into account the patient's context and values about specific harm related to the procedure (Newton, 2016).

Asia, Singapore, Korea, and Taiwan have implemented national breast cancer screening program managed by their respective governments. Low- and middle-income Asian countries lack facilities for mammographic screening (Kim et al., 2015). Singapore recommends that the age to start screening mammography is 40 years (Sim et al., 2009). Malaysia is currently practicing opportunistic screening for breast cancer (Dahlui et al., 2011). Mammography as an early detection tool is indicated for women who are considered high risk. Women who had history of breast atypia on previous breast biopsy, history of cancer in one breast and/or ovary, and women with family history of breast cancer in one or more first or second degree relatives before the age of 50 are said to be high risk. Mammography done in government facilities is free for high risk women only. Otherwise the cost for non-high risk women is RM 100 to RM 120 (~US $30). Mammography for women under the age of 40 can be done at the discretion of the physician or if the patient wishes to have it (Dahlui et al., 2011). In Vietnam, a national

breast cancer control program as recommended by the WHO has yet to be realized. According to Trieu et al., there is little evidence that breast cancer screening through mammography will be effective in the South East Asian setting, particularly in Vietnam. High quality data are needed to inform decision on choice of radiologic modality, frequency of examination, and group of women to be prioritized (Trieu et al., 2015). Likewise, in Malaysia, population-based screening mammography is not recommended due to limited resources and lack of local statistics on mammography and breast cancer (Dahlui et al., 2011). Added to these, Asian women tend to have denser breasts, which may increase false-negativity of mammography. Sensitivity of mammography is increased with the use of other diagnostic procedures, such as ultrasound (Kim et al., 2015).

Philippines. Like Vietnam (Dahlui et al., 2011), Egypt (Ahmed et al., 2014), and Turkey (Secginli & Nachivan, 2005), the Philippines has no established nationwide screening program (Redaniel et al., 2010). Although, mammography is already available in the country, it is cost-prohibitive for the majority of Filipino women, and government/public hospitals do not offer the service for free. Dulanas (2016) cited a report from the Philippine Department of Health (DOH) that only 2% of Filipino women had annual mammography in 2000. In addition to cost, other barriers to screening mammography involving Filipinos living outside of the Philippines were lack of time (Ko, Sadler, Ryujin, & Dong, 2003), accessibility issues, belief that mammography is needed only when there are symptoms, and embarrassment (cultural beliefs of not wanting to talk about breast; Wu & Bancroft, 2006). Similar barriers were also

demonstrated by Malaysian study participants (Parsa et al., 2008). Oftentimes the use of mammography in the Philippines is diagnostic in nature (PCS, 2014).

Clinical Breast Examination

United States and Asian Countries. Newton (2016) reported that the 2016 United States Preventative Task Force recommendation concluded that current evidence is insufficient to assess the additional benefits and harms of CBE. However, both the American College of Obstetrician and Gynecologists and the American Cancer Society continue to recommend its use (Newton, 2016), especially for women younger than 40 years of age.

In Asian countries where mammography facility is limited and costly, annual clinical breast examination alone may be a cost-effective option (Kim et al., 2015). In Malaysia, CBE is recommended and encouraged for women above 20 years up to 39 years of age to be done every 3 years by trained health care workers. For women above 40 years of age and for high risk women regardless of age, the recommendation is an annual CBE (Dahlui et al., 2011). In India, annual CBE was found to be as effective as the biennial mammography and does not cost much (Okonkwo, Draisma, & der Kinderen, 2008).

Philippines. In the Philippines, breast cancer screening by CBE is advocated by the Philippine government (Redaniel, 2010; Ngelangel & Wang, 2002). CBE is used to confirm the positive findings from breast self-examination (PCS, 2014). An attempt to determine the efficacy of the annual CBE performed by trained nurses and midwives in the Philippines through a randomized clinical trial took place from 1996 to 1997 with 151,168 Filipino women as participants (Smith et al., 2006). The study was short-lived

due to multiple issues but offered some valuable lesson in terms of introducing CBE screening. The lessons learned were to have realistic expectations about the necessity of ongoing training and monitoring of examiners, greater levels of experience for newly trained personnel, and to identify and overcome culturally health related beliefs (Smith et al., 2006).

Knowledge/Beliefs about Breast Cancer and Breast Cancer Screening

Lack of basic knowledge about breast cancer and breast screening methods for early detection continue to negatively affect the outcomes of breast health for women. Knowledge is a necessary component for early detection (Ramathuba et al., 2015).

Sunil et al. (2014) recruited 933 Hispanic women living in colonias located along a 150-mile range in the U.S.-Mexico border. Colonias can be likened to developing countries in terms of disparities in lack of sanitation and high susceptibility to illness. The findings of the study showed that the women had low to moderate levels of breast cancer knowledge. The same low level of knowledge or awareness on breast cancer is also reported as regard to the Filipino women (Philippine Council for Health and Research Development, 2008). Sim et al. (2009) conducted a study in Singapore with 1,000 Asian women who showed that the respondents had high scores for general knowledge on breast cancer and disease progression but had poor knowledge level on risk factors, screening, and treatment. Increasing age, Malay race, lower educational level, small housing, and not knowing anyone with breast cancer were found to be associated with lower knowledge scores (Sim et al., 2009). Likewise, Ryu, Crespi, and Maxwell (2013) stated that a low level of education is associated with low mammography screening rates among Asian-American immigrants that include Filipino women residing in California. A

similar finding in UK was also put forth by Edgar et al. (2013). Parsa et al. (2008) found that a high level education did not correlate with high level of knowledge about breast cancer symptoms and risk factors. The level of knowledge of the teacher-participants in the study on breast cancer screening methods was low to moderate, which is in contrast with Funke, Krause-Bergmann, Pabst, and Nave (2008) who found that women with a lower degree of education were found to examine their breasts more often than once a month than women with higher degree.

Sim et al. (2009) found that most respondents thought that absence of any risk factor for breast cancer means not developing the disease. Interestingly, most of the respondents still believe in the local myth that a large breast is a risk factor for breast cancer (Sim et al., 2009). A diagnosis of breast cancer is still viewed by many Filipino women as life threatening (Redaniel et al., 2010).

Sim et al. (2009) found that normal BSE is regarded by about 27% respondents as not needing further screening and that radiation from mammography was dangerous and can increase one's risk. Ramathuba et al. (2015) found that most respondents have never performed breast cancer diagnostic tests. However, it was found that women with higher levels of knowledge about symptoms and screening methods demonstrated high performance rates of BSE (Parsa et al., 2008). Kayode et al. (2005) found a positive attitude towards BSE but low practice rate. Wu et al. (2006) found in their study of women of Asian descent, including Filipino women, residing in Southeastern Michigan that these women shared common barriers to clinical breast examination. These barriers identified were being examined by male practitioner and having their breast touched by a stranger. The participants also identified being exposed to unnecessary radiation as a

barrier to screening mammography. In addition to these barriers, Filipino women in the study added that they were “afraid that mammography will find cancer” (Wu et al., 2006).

Sources of Information for Breast Cancer and Screening Modalities

From whom and where women obtain their information may also influence whether they will engage in a particular screening or not. Sunil et al. (2014), for instance, found that the study respondents’ preference as the primary source for health related information was the physicians and their first point of contact when a breast lump was found is their family physician. Sim et al. (2009), on the other hand, reported that most respondents received information about breast cancer from television, followed by posters, family members, family physician, and formal teaching. Media was also the main source of information about breast cancer in Ramathuba et al.’s study although it was not specified the type of media used. The respondents in that study listed medical doctor, a traditional doctor, or a prophet are whom they will consult in the event that any noticeable changes in their breast was found (Ramathuba et al., 2015). Similarly, British Caucasian women’s primary source of information is media sources while Black minority women preferred their general practitioners (GPs) as their primary source of breast health information (Sim et al., 2009). In a Malaysian study, the respondents’ main sources of information on breast cancer and breast cancer detection methods were mass media, followed by brochures, friends, and doctors/nurses (Parsa et al., 2008). It is interesting to note that Kayode et al. (2005) found the respondents reported that their least source of their health information was the health personnel. Boxwala, Bridgemohan, and Griffith (2010) studied Asian Indian women in Metro Detroit and confirmed other studies’

findings. The recommendation of a health care provider, especially a physician, for a mammogram is an important predictor of breast cancer screening adherence. Health care providers are considered as trusted resource of health information (Boxwala et al., 2010). The television or electronic media was listed as the respondents' first source of information followed by radio (Kayode et al., 2005). In a cross-sectional study involving Malaysian female undergraduate students, it was reported that the most common source of information about BSE were printed media and from medical health personnel (Akhtari-Zavare, Juni, Ismail, Said, and Latiff (2010).

Educational Programs/Teaching Strategies for Breast Cancer

Education is a marker of specific traits, such as intelligence, acquisition of adaptive skills, or awareness of risky health behavior and may influence one's knowledge about breast cancer and breast cancer screening methods. Health education can empower women to take a proactive approach in to regard for their health (Ramathuba et al., 2015; Ryhanen et al. 2012). Cognitive factors that may influence mammography uptake rates regardless of demographic characteristics can be manipulated through educational initiatives intended to improve knowledge on breast cancer and benefits of breast screening and early detection (O'Mahony et al., 2014)

Current information and education to increase breast cancer awareness are either directed to high risk women or women in general (O'Mahony et al., 2014). It is suggested that information and education be tailored to women's specific need (Edgar et al., 2013) and individualized considering patient's knowledge expectations (Ryhanen et al. 2012). Wu and Bancroft (2006) and Edgar et al. (2013) strongly suggested that culturally specific method of outreach programs intended to improve adherence to breast screening

be considered by health care professionals. Hall et al. (2007) had alignment with this suggestion. To increase Hispanic women's knowledge about breast cancer, the researchers employed a multifaceted, culturally sensitive, readable, and linguistically appropriate educational program to provide breast cancer materials. The educational program utilized community-based Hispanic interpreters, and the researchers collaborated with community partners where the study was conducted. Byrne and Robles-Rodriguez (2009) expressed the need to develop more innovative strategies to promote breast cancer awareness. One such innovative strategies is Educational Parties developed to educate underserved and uninsured women in New Jersey. Gaming strategies like Breast Cancer Bingo, Fact or Myth? and self-created version of Breast Cancer Risks were incorporated in these Educational Parties (Byrne & Robles-Rodriguez, 2009). The Asian Grocery Store-Based Education Program that was implemented from 2000 to 2004 for Asian American women (Chinese, Filipino, Korean, and Vietnamese) in California was designed as a brief repetitive intervention to increase breast cancer awareness and knowledge of the participants for the purpose of motivating them to follow recommended screening guidelines (Sadler et al., 2012). These educational programs used a brief face-to-face education session, flyer with information on the state's free cancer screening program, an in-depth and easy-to-read educational packets mailed to the participants, and a second complementary packets of information that was also mailed. The result showed that non-adherent women in the intervention group were most likely to have scheduled a screening mammogram in the 2 months following the intervention (Sadler et al., 2012). Han, Lee, Kim, and Kim (2009) used trained lay health workers to recruit Korean women respondents and to deliver breast health education to the study participants in the

language that the participants could understand. The study showed that using lay health care workers resulted to an increase adherence to breast screening guidelines (Han et al., 2009). Meanwhile, Hall et al. (2007) employed a multi-media educational format to provide a readable culturally sensitive and materials to Hispanic women living in the United States. The educational program utilized Hispanic interpreters from the community where the study was conducted. Determining the effectiveness of nurse-delivered breast health was the focus of Secginli and Nahcivan (2011), which showed that the nurse-delivered breast health promotion program is not a strong enough intervention to overcome barriers to having a CBE and mammography for the population of the study. It was recommended that health system infrastructure and access to available health care issues need to be considered in the development of a breast health program (Secginli & Nahcivan, 2011). In a similar study conducted in Jordan, Taha et al. (2010) found that there is a need to explore women's experiences and socio-cultural barriers to breast-health-seeking behavior. Although group educational lectures were found to be effective for improving breast health knowledge, there were low breast health practices among the participants. Increase in knowledge did not correlate with increase in practice (Taha et al., 2010).

As the threat of increasing morbidity and mortality from breast cancer continues to loom over Asian nations, Kim et al. (2015), reported that increasing breast cancer awareness through public education, increasing availability of trained health staff, and identifying high risk women were useful and cost-effective strategies for secondary prevention in resource limited countries, such as the Philippines.

Web-Based Educational Programs About Breast Cancer

The use of the Internet as the main source of information and education for many people began in the mid-1990s (Grassley & Bartoletti, 2009; Ryhanen et al., 2012). It is anticipated that growth and proliferation of online education programs in nursing will continue moving forward (Grassley & Bartoletti, 2009). The use of social media networking sites, such as Facebook (FB), by health organizations to communicate health messages and encourage user participation is increasingly becoming a popular platform. Its effectiveness in health promotion is still slowly emerging in the literature (Abramsom, Keefe, & Chou, 2015). Ryhanen et al. (2012) implemented an Internet-based patient educational programme called Breast Cancer Patient Pathway (BCPP) to Finnish women who were newly diagnosed with breast cancer. Both control and intervention groups received oral and written patient education materials. In addition, the intervention group had an education with the researcher who taught them about the use and content of the Web page for BCPP. The participants in the intervention group were given a username and a password. After the initial session, participants in the intervention group were able to use BCPP program during their treatment process. On the other hand, D'Agostino et al. (2012) focused on the differences for women with a difference in breast cancer in discussing or not discussing cancer-related issues over the Internet. Bock et al. (2012) utilized a secure Web-based health questionnaire in their study. This Web-based questionnaire enabled breast cancer patients who have care at the clinic to provide and update their health history and symptoms. This update was also done for each follow-up clinic visit. The results showed that the program increased symptom reporting by patients and facilitated patient-provider communication (Bock et al., 2012). The Hispanic women's knowledge about breast cancer increased after a two-part educational program

was implemented by Hall et al. (2007) that used readily available selected sections from Susan G. Komen Breast Cancer Foundation interactive Web site on Anatomy of Breast Cancer as the first of two components of their study. In a qualitative study, Abramson et al. (2015) analyzed the entries on a Facebook page of a non-profit organization that is dedicated to raising awareness about breast cancer. The researchers specifically evaluated the content of the dialogue between the organization and the users of the Facebook page based on the Wall posts during the 2010 Breast Cancer Awareness Month. The purpose was to determine the interactions and behaviors surrounding health promotion efforts. The researchers used a grounded theory approach and found five main themes: Facebook as an open space for self-expression, promoting awareness with scarce health information, commodification of breast cancer (marketing of the organizations' breast cancer related products), unpredictable location and evolution of conversation, and gendered images and language (Abramson et al., 2015).

Chapter Summary

This chapter presented the pathophysiology, statistical data of breast cancer rates, and incidence in the Philippines and how these rates compared with those in the US and other Asian countries. Although the incidence rate in the Asian countries in general is still low compared with the Western countries, there is an upward trend in the Philippines rate compared with other countries in the Asian region. In addition, as of this time, there is no national screening guidelines established in the Philippines. There are limited studies about knowledge of breast cancer and breast cancer screening modalities among Filipino women. Most of the studies reviewed included Filipino women living outside of the Philippines as the study participants. Among the studies reviewed, only one study

included Filipino women living in the Philippines as participants. The investigator focused on Filipino women living in the Philippines. No researchers focused on Philippine-based Filipino women's level of knowledge, the predictive ability of their perceptions/beliefs about breast cancer and breast cancer screening modalities, modifying factors, and sources of information about their intent on performing BSE, submit to screening mammography, and engage in CBE

Chapter 3

Methods

The purpose of this study was to investigate the following: relationships of Philippine-based Filipino women's level of breast cancer related knowledge, and their frequency of performing BSE, and if the variables of breast-cancer-related knowledge, perceptions/health beliefs about breast cancer and breast cancer screening modalities, personal modifying factors, and sources of information are significant predictors of the respondents' intent to perform BSE, submit to screening mammography and engage in clinical breast examination.

Specifically, this investigator attempted to answer the following questions:

1. What is the relationship between the breast-cancer-related knowledge of Philippine-based Filipino women and their frequency of performing BSE?

2. Are the Philippine-based Filipino women's breast-cancer-related knowledge, perceptions/health beliefs about breast cancer and breast cancer screening modalities, personal modifying factors, and sources of information significant predictors of their intent to perform BSE, submit to screening mammography, and engage in clinical breast examination?

The quantitative data collected presented valuable information that helped the investigator identify issues or gaps in breast-cancer-related knowledge, perceptions/beliefs about breast cancer and breast cancer screening modalities of the

respondents. The investigator used the identified gaps to better understand breast health educational needs. These data will be used by the investigator to direct future development of a cost-effective and Web-based educational intervention that is geared to the Philippine-based Filipino women's specific educational needs, culture, and beliefs (Wu & Bancroft, 2006). Aim of the educational interventions is for improving the Philippine-based Filipino women's breast health outcomes.

Research Design

This investigator used quantitative exploratory method. This approach was chosen in congruence with the post-positivism philosophy that underpinned the study. The specific design that was used was nonexperimental descriptive method design. This design is appropriate because the focus of the study was to determine the relationships among the study variables and whether these variables can be used as predictors of the respondents' intent to perform BSE, submit screening mammography, and engage in CBE (Polit & Beck, 2012).

Research Assumptions

Research assumptions are things that are understood to be true by the investigator without proof, but they are important to the study (Simon, 2011).

The assumptions of this study were the following:

1. The survey questionnaire will measure the intended measurements as regard to the variables being investigated in this study.

2. The respondents in this study will respond to the survey questions with integrity and honesty.

3. Data that will be obtained from women living in the Philippines will be a representative of Philippine-based Filipino women.

4. Responses to the questions will reflect the Philippine-based Filipino women's true ability plus some errors. This error can be the results of the instrument, examiner, examinee, or the environment (Miller & McIntire, 2006).

Setting

This study was conducted in the Philippine setting. The Republic of the Philippines is an archipelagic country composed of 7, 107 islands located in the South Eastern Asia region just east of Vietnam and bordered by the Philippine Sea and Pacific Ocean to the east, the South China Sea to the west, the Bashi Channel to the north, and by the Celebes Sea to the south. The three biggest islands are Luzon, Visayas, and Mindanao (Asian Info, 2016). The country is also divided into 18 administrative regions with 33 highly urbanized cities, 14 of which are in the Metro Manila area in the National Capital Region. There are 1,489 municipalities and 81 provinces (Asian Info, 2016). The respondents of the study were from the different provinces, cities, and municipalities of the country although the places were not equally represented.

Sampling Plan

Sampling Strategy

Changes in technology have given rise to newer versions of nonprobability sampling methods. One of these newer methods called respondent-driven sampling (RDS), which is a form of snowball sampling that relies on referrals from the initial nonprobability sample to recommend additional respondents This method is usually used

to select samples of members of social network when complete list of the members is nonexistent (Battaglia, 2011).

The investigator posted information about the study on her existing Facebook private messenger page. Individuals who were interested in learning more about the study were encouraged to respond. The initial sample included individuals from the investigator's existing Facebook contacts who agreed to participate and met the criteria. This sample was the initial convenience sample. Additional individuals were recruited by asking initial respondents to recruit other eligible participants. They were requested to ask contacts of theirs who may be interested in learning about the study to contact the investigator through the investigator's private FB messenger. Recruitment continued until the targeted numbers of respondents had been reached. The purpose of the study and risks and benefits were explained to those who contacted the investigator for more information.

To successfully recruit participants, it was emphasized that participation in this study was voluntary, and the investigator explained the benefits of the study for both the participants and the society. In addition, responding to the questionnaires was at the respondents' convenience; the questionnaires were delivered through the Internet via Qualtrics. Respondents were assured that their responses were reported in aggregate and that the anonymity and confidentiality of their responses were maintained. The use Qualtrics software increased the anonymity of the respondents.

Eligibility Criteria

Inclusion criteria. The respondents in the study were Filipino women living in the Philippines, aged 20 years old and above, able to read and understand English, have

access to the Internet, have a Facebook account, and know how to navigate this social media. According to PSA (2016), 61.0% of the total Philippine population uses the Internet and 56% of the population have a social networking account.

Exclusion criteria. Philippine based Filipino women who had been diagnosed with breast cancer or currently diagnosed with breast cancer and undergoing any form of breast cancer treatment were not included in the study.

Determination of Sample Size

Power analysis. In order to reduce Type II error and strengthen statistical conclusion validity, a power analysis was performed prior to the conduct of the study. In the dissertation study, the level of significance was set at $\alpha = .05$, which is an acceptable level for the type of study being proposed (Polit & Beck, 2012). For this study, a medium effect size (ES, .50) was chosen based on some studies that used similar effect size (or by convention) as suggested by Cohen (1988). In dissertation study, power .80 was used. To calculate the sample size (*N*) for this study the following parameters were used: $\alpha = .05$, $1-\beta = .80$, and ES = .05, which resulted to approximately 300 respondents.

Protection of Human Subjects

The study commenced after the approval of the Institutional Board (IRB) was secured. An invitation to participate in the study was posted in the investigator's personal Facebook private messenger and was sent to the investigator's existing personal FB messenger contacts. Once the contacts responded positively to the invitation, they were provided with the link to a detailed description of the study and their required involvement. The detailed description included the purpose, the overall significance of

the results of the study, collection data procedure, confidentiality, and data management (see Appendix B).

The respondents were assured that their responses were reported as a group. They were also assured that they could withdraw their participation at any point if they wish to do so. The respondents was given the choice to continue their participation by selecting the Continue button or the Cancel button if they wished not to continue with their participation. The Continue or Cancel buttons were also available on each page of the questionnaires for the respondents' use at any point in the study.

The respondents were aware that they could contact the investigator at any time through FB private messenger chat or video call. These features are free to both the respondents and investigator. All of these communications occurred in the dedicated and encrypted FB messenger. The respondents were not asked to divulge any identifier when they were provided with the study link.

Risks and Benefits of Participation

The risk of participating in the study included the time that the respondents spent in answering the questionnaire, which is considered minimal. The respondents spent a maximum of approximately 30 minutes to complete the questionnaire. There are no direct benefits for participating in this study. However, the data gathered from the responses provided by the respondents will help the investigator to better understand the respondents' level of knowledge, perceptions/beliefs, sources of information, and preferred educational platforms about breast cancer and breast cancer screening modalities. The data will be the basis for future development of educational interventions that are aimed to improve breast health outcomes.

Data Storage

All data were encrypted, password protected, and stored electronically in the investigator's personal laptop. Electronic storage reduced the use of physical storage space, paper, and increased ease of accessibility of the data to the investigator. Data will be kept for at least 3 years post dissertation defense.

Procedures

A private Facebook messenger page dedicated to the study was created with the help of an online instructional designer. This page hosted the link to the study's survey questionnaires. Once the study linked was accessed, it opened to a Qualtrics page in which the respondents answered the questionnaires. Qualtrics is a research program that allow researchers to design sophisticated and customizable online surveys. It does not record the names of the respondents thus ensuring anonymity; it eliminates respondents' bias by not showing other respondents who are completing the surveys (Carr, 2013). The questionnaires were presented in small sections or chunks so as to not overwhelm the respondents with questions presented all at once. Likewise, progress to completion of the other questions was ensured by affording the participants to go back with ease to the previous questions that were missed or unanswered, which eliminated incomplete data thus decreasing wastage of potential data and time to clean the data.

Initial recruitment of respondents occurred through the investigator's private Facebook messenger page exclusive to relatives and friends. The invitation about the investigator's plan to conduct a study about breast cancer and breast cancer screening modalities was sent to the investigator's personal contacts in the FB messenger (see Appendix C).

Those individuals who expressed interest in obtaining information about the study were directed to complete a screening questionnaire in Qualtrics (see Appendix D).

If the responses to the screening questionnaires met all the inclusion criteria, then the respondent was directed to select the link to a detailed description of the study and his or her required involvement. On the other hand, respondents who did not meet inclusion criteria were presented a screen with a "Thank you for your time" message displayed, and the screen closed automatically.

Each respondent's responses to the questionnaires were recorded in the Qualtrics system in real time, which facilitated economical and accurate data entry and easy access and retrieval of data. The pooled data were exported to SPS and R for statistical analysis. Respondent recruitment and data collection commenced after the approval of the Institutional Review Board was issued.

Instrumentation

Part I of the survey questionnaire has six questions about the respondents' personal modifying factors: age, educational level, income level, family history of breast cancer, marital status, and place of residence. For the question about age, the respondents quantitatively supplied the answer. Income, educational levels, marital status, and place of residence were placed in categories. For the history of breast cancer, the respondents chose either Yes or No.

One multiple question for the frequency of examining their breast by BSE was asked. Multiple answer questions about the current sources of information and their preferred educational platforms for breast cancer and breast cancer screening modalities were also included in this section. A Yes or No question was used for the dependent

variables of intent to perform BSE, submit to mammography screening, and engage in CBE (see Appendix E).

Part II of the survey questionnaire is the Breast Cancer Knowledge Test developed by McCance et al. (1990). This tool was used to determine the respondents' level of knowledge about breast cancer and breast cancer screening modalities (see Appendix F).

Part III of the questionnaire included

1. Champion Revised Susceptibility, Benefits, and Barrier Scale for Mammography (Champion, 1999).

2. Sunil et al.'s study instrument (2014) about CBE's benefit and barriers.

These questionnaires were used to determine the respondents' perceptions/health beliefs about breast cancer and breast screening modalities (see Appendix G).

McCance Breast Cancer Knowledge Test

The Breast Cancer Knowledge Test was used to determine the Philippine-based Filipino women's breast cancer and breast cancer screening related knowledge. BKCT was developed by McCance et al. in 1990 as an expansion of Stillman's knowledge questionnaire. The BCKT contains 19 multiple choice question; it measures a respondent's knowledge about detection and screening practices for breast cancer. Initially, the pretested instrument contained a total of 30 items that included questions pertaining to BSE, mammography, and professional examination or clinical breast examination. These items were generated based on Stillman's instrument (McCance et al., 1990). The validity of the BCKT content was established by four experts: a medical oncologist and noted authority on public education programs for cancer control, a nurse

researcher in health education and cancer nursing, a medical oncologist who was the president of the American Cancer Society at the time of BCKT research, and a clinical nurse specialist and researcher in cancer nursing. After the content was validated, pilot testing was conducted with 20 women participants who were from church organizations and church volunteers who were not nurses (McCance et al., 1990). The respondents provided feedback on readability, clarity, and format problems. Reliability testing was conducted on a convenience sample of 101 women aged 50 or older. The reported internal consistency reliability for the selected 18 items using the Kuder-Richardson 20 statistic (Kr20) was .81, which is considered a high degree of internal consistency and reliability.

The data obtained from this test and from the other instruments will be used to design educational interventions for promoting breast cancer and breast cancer screening related knowledge. This same instrument can be used to evaluate the effectiveness of the intervention later on (McCance et al., 1990).

Champion Revised Susceptibility, Benefits, and Barriers Scale for Mammography

The development of the Revised Susceptibility, Benefits, and Barriers for Mammography, which was anchored on the health belief model's constructs of susceptibility, seriousness, benefits, barriers, health motivation, and confidence in the context of breast cancer and breast cancer examination, was started in 1984 by Victoria Champion (Champion, 1993). The initial instrument focused on breast cancer and BSE (Champion, 1993). The 1984 BSE-related health belief model scale was re-evaluated in 1993, and a new scale to measure confidence was developed. The addition of the confidence scale was based on the reconceptualization of HBM, which incorporated self-

efficacy (Champion, 1993). The instrument underwent another revision in 1999 that included revision of the susceptibility construct and the inclusion of perceived benefits and barriers to mammography, which were not included in the previous scales. The 1999 revision took place within a large intervention study to increase breast screening in women age 50 and over.

The revised RSBBSM contains a total of 58 items and utilizes a five-point Likert scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. The 1999 revised instrument contains six subscales*: susceptibility* with five items, *seriousness* with seven items, *benefits* (BSE has six items and mammography five items), and *barriers* (to BSE has six items and to mammography has 11 items). The construct of *confidence* has 11 items while general health *motivation* has seven items (Champion, 1999).

1. Seriousness subscale has seven items. This subscale measures the perceived degree of personal threat related to breast cancer. Internal consistency Cronbach alpha is .80 and re-test reliability of .45 (Champion, 1993).

2. Susceptibility subscale has five items. This subscale measures the perceived personal risk of contracting breast cancer. The susceptibility scale has an internal consistency reliability of .87 and a test-retest reliability at .62, which was considered acceptable (Champion, 1999).

3. Benefits subscale is divided into two. Benefits of breast self-examination and mammography.

3a. Benefit of breast self-examination subscales has six items. This subscale measures perceived benefits of breast self-examination. Cronbach alpha is .80 and the test-retest reliability was .45 (Champion, 1993).

3b. Benefits of mammography has 5 items. This subscale measures perceived benefits of mammography. The Cronbach alpha was .79 and test-retest reliability of .61 (Champion, 1999).

4. Barriers subscale is divided into two: barrier to BSE and barrier to mammography.

4a. Barrier to BSE has six items. This scale measures the perceived negative components of BSE. The internal consistency for the barrier scale is .88. The test-retest reliability for the barrier to BSE scale was .71 (Champion, 1993).

4b. Barriers subscale to mammography has 11 items. This measures perceived negative components of mammography. The reported Cronbach alpha was .79 and test-retest reliability was .71 (Champion, 1999).

5. Confidence subscale has 11 items. This measures the perceived procedural competence to perform breast self-examination with the perceived ability to detect abnormal lumps. The reported Cronbach alpha was .88 and test-retest reliability was .65 (Champion, 1993).

6. General health motivation subscale. This subscale measures the beliefs and behavior related to the state of general concerns about health. Cronbach alpha was .83 and test-retest reliability was .67 (Champion, 1993).

Overall, items reflected strong internal consistency reliability and test-retest reliability. The reliability information relating to the six subscales are listed below:

This investigator used the seriousness, susceptibility, benefits, and barriers (to BSE and mammography) subscales to determine the perceptions/beliefs of the respondents about breast cancer and breast cancer screening modalities. The items on

these scales were presented in a randomized in Qualtrics such that the construct under which each item belongs was not identified. The subscales on confidence and general health motivation were not used in this dissertation study.

Perceived Barriers to CBE

To augment Champion's RSBBSM questionnaire, Perceived Benefits and Barriers to CBE (Sunil et al., 2014) questionnaire was also used. There are 14 items related to CBE barriers and one item that pertains to benefits of CBE. Sunil et al.'s questionnaire was anchored with the health belief model and the questions were phrased similarly to Champion's mammography questions.

Sunil's et al. (2014) reported CBE barrier scale ranged from 0 to 64 with Cronbach's alpha = .945. In this scale, the responses were based on a five-point Likert scale with 0 = *Strongly Disagree,* 1 = *Disagree,* 2 = *Neutral,* 3 = *Agree,* and 4 = *Strongly Agree.* In this dissertation study, the scale followed that of RBSSM. The five-point Likert scale anchors of scale were: 1= *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, and 5 = *strongly agree*. With this scale, the CBE barrier range score is 14 and 70, and for the benefit of CBE, the range score would be 1 to 5 because there is only question for this subscale.

Scoring

Personal modifying variables. The responses of the respondents to the personal modifying variables were coded as follows for statistical purposes:

1. Marital status. 0 will be given for responses of not married (single, widow, and separated and 1 = married or in a relationship responses.

2. Income level. 0 = for Php 9,000.00 or less income and 1 = for more than Php 9,000.00 income.

3. For educational level. 0 = elementary graduate or less, 1 = some high school and high school graduate, 2 = some college and college graduate, 3 = some graduate studies and masters/doctoral graduate.

4. Family history of breast cancer, which has a dichotomous answer of Yes or No, will be coded 0 = for No answer and 1 = for a Yes answer.

5. The same coding will be used for the dependent variables of performing breast self-examination, engaging in clinical breast examination, and submitting for mammography screening, which will be also answered with a dichotomous Yes or No. For the variable sources of information, the code will be as follows:
0 = non-health care provider, 1= nurse/midwife/barangay health care worker, and 2 = physician responses.

6. For place of residence the code will be as follows: 1 = urban, large city; 2 = small city; and 3 = town/municipality.

7. Age will not be coded because the information will be collected as quantitative data.

BCKT. For this instrument, 1 was assigned to the question that the participant provided the correct answer, 0 if the respondent answered the item incorrectly, and NA (not applicable) for other responses, such as I don't know. Possible correct answers ranged from 0 to 19. The number of correct answers were summed up to create a BCKT index. Scores of 19 to 16 were designated as high level knowledge, scores 15 to 10 as moderate level, and score of 9 to zero was designated as low-level knowledge. An item

analysis was also be conducted to yield information on the performance and quality of the individual test items. Performing item analysis was used to provide opportunity to improve the test item and overall test quality.

RSBBSM and perceived barriers to CBE. The items in both the RSBBSM and Perceived Benefit and Barriers to CBE scale are formatted with a five-point Likert scale ranging from *strongly agree to strongly disagree*: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, 5 = *strongly agree*. Each subscale was scored such that a high score would mean greater susceptibility, seriousness, benefits, and barriers. A scale was created by summing up the questionnaire responses for each subscale. For example, the subscale of perceived susceptibility has five items, and the score may range from 5 to 25, whereas a greater score will represent greater susceptibility to breast cancer. The same scoring procedure was followed for the seriousness and benefits subscales for BSE, mammography, and CBE.

General Statistical Strategy

Responses to the questionnaire were aggregated by Qualtrics, which was then exported to Statistical Package SS version 18 or R. Parametric data was subjected to analyses to assure they had met the basic assumptions of normal distribution and homogeneity of variance.

Data Cleaning

Data cleaning was done by software system Qualtrics. The survey questions were administered via Qulatrics, which was hosted in a secure Facebook page dedicated to this study. The questions were deployed in a format such that the respondents were able to check their answer to each question before proceeding to the next question. This format

eliminated the issue of missing data and incomplete questionnaires. The use of Qualtrics eliminated error, volunteer bias, and guaranties of anonymity of the respondents.

In the event that there were outliers, they were evaluated as to the type of information they provided. The data were analyzed in two ways: with and without the outliers in the distribution. The outliers were ignored if the results are similar. However, if the results were dissimilar, statistical analysis that is resistant to outliers like median and interquartile range (IQR) will be used (Plichta & Kelvin, 2005).

Descriptives

Descriptive statistics were used for the independent variables of the study, which were the respondents' level of knowledge; perceptions/health beliefs about breast cancer and breast cancer screening modalities; personal modifying factors (age, marital status, income, educational level, family history of breast cancer, place of residence, and sources of information); preferred educational platform; intent to perform BSE, submit to mammography, and engage in CBE.

Reliability Testing

Cronbach's alpha was used to establish the reliability of the instruments used in the dissertation study. Cronbach's alpha is an index of reliability measure of the internal consistency of the scale, which is expressed as number from 0 to 1. In this dissertation study, Cronbach's alpha was calculated for the BCKT and for the subscale of susceptibility, seriousness, benefits and barriers to BSE and mammography, and benefit and barriers to CBE. The acceptable values for alpha ranged from .70 to .95 and was followed in this study. Values below 0.70 would mean unreliable and, therefore, were not included.

Hypothesis Testing

The investigator used the following statistical measures to test the hypotheses put forth in this study.

1. Hypothesis 1. Is there is a significant relationship among the Philippine-based Filipino women's breast-cancer-related knowledge and their frequency of performing BSE?

For this hypothesis, Pearson product-moment correlation (Pearson R) was employed. The investigator was interested if the respondents' breast-cancer and breast-cancer-screening-related knowledge and the frequency of performing BSE were significantly related and how strong that relationship was.

2. Hypothesis 2. Are Philippine-based Filipino women's breast cancer and breast-cancer-screening-related knowledge, perceptions/beliefs about breast cancer and breast cancer screening modalities, personal modifying factors and sources of information are significant predictors of their intent to perform BSE, submit to screening mammography, and engage engaging in CBE?

In this hypothesis, the predictive ability of the four independent variables (breast cancer and breast-cancer-screening-related knowledge, perceptions/beliefs about breast cancer and breast cancer screening modalities, personal modifying factors, and current sources of information) was determined to predict the dependent variables that were the respondents' intent to perform BSE, submit to screening mammography, and engage in CBE. Logistic regression techniques were used. According to Salkind (2005), prediction is an activity that computes future outcomes from present ones. Other statistical techniques that were employed prior to the use of logistic regression techniques were

standard deviations, means, odds to determine the probability of the respondents' intent to perform BSE, submit to screening mammography, and engage in CBE. The descriptive statistics were used for the knowledge, perceptions/health beliefs and personal modifying factors, sources of information, and preferred educational platforms on breast health of the respondents.

Limitations

The extent to which appropriate inferences from the study can be made is the concern of study validity (Polit & Beck, 2012). Threats to validity are reasons why inferences could be wrong. There are two types of threats that need to be considered by the investigator (Polit & Beck, 2012).

Threats to Internal Validity

One perceived threat for this study was selection bias. In non-experimental designs in which the respondents are not assigned to either control or intervention group, selection bias is the most problematic and frequently encountered threat to internal validity. The threat of selection bias may be reduced by the use of the respondent-driven nonprobability. In the dissertation study, the respondents were selected based on a set of criteria (Filipino women living in the Philippines, aged 20 and over, speaks and understands English, has an Internet connection, has a FB account, and has skill to navigate their account). The initial sample was from the investigator's personal FB messenger contact. The geographical locations from where the participants were located was thought to be representatives of the other geographical locations in the Philippines. Statistical control like the analysis of covariance and utilizing a homogenous sample can

be employed as needed to remove the effect of variability on confounding variable (Polit & Beck, 2012).

Threats to External Validity

Two of these threats are interaction between relationship and people interaction between causal effects and treatment variation (Polit & Beck, 2012). By virtue of the criteria that must be satisfied by the respondents in order to participate in the study, the results may not be generalized to Filipino women not living in the Philippines, those who do not speak and understand English, and those who do not have an Internet or FB messenger account. According to the PSA (2016), 61% of the Filipino population uses the Internet, and 56% of the population has social networking account. The intended settings of the study, especially the highly urbanized cities in Metro Manila, may provide a microcosm of the Filipino women because those cities have highly diversified population. The urban city and municipality selected can also mirror the other municipalities and other urban cities in the country.

Chapter Summary

A quantitative exploratory method research design and respondent-driven sampling (snowballing) method was used in the study. The main instruments employed were BCKT, RSBBSM, and Sunil et al.'s CBE instrument as a supplement to RSBBSM. These instruments determined the Philippine-based Filipino women's breast-cancer-related knowledge, perceptions/beliefs about breast cancer, and breast cancer screening modalities. Part I of the questionnaire was used to elicit information as to the respondents' personal modifying factors; frequency of BSE performance; current sources of information; preferred educational platform; and intent to perform BSE, submit to

mammography, and engage in CBE. Power yielded 300 respondents. The questionnaires were deployed utilizing Qualtrics software, the link of which was hosted in a dedicated FB created for the study. All data collected were polled by Qualtrics ensuring accurate and real-time data entry and at the same time maintaining anonymity and confidentiality of the respondents. Descriptive statistic, Pearson R correlation, and logistic regression were used for statistical analyses. Reliability of the instruments used was ensured by Cronbach's alpha. Threats to the validity was controlled with the use of power analysis, homogenous sample, and respondent-driven sampling method.

Chapter Four

Results

The results of the data analysis for this quantitative exploratory study are reported and discussed in this chapter. The purpose of this dissertation study was to investigate the level of knowledge of Philippine-based Filipino women about breast cancer and breast screening modalities, their beliefs/perceptions by measuring their perceived susceptibility, severity/seriousness, benefits and barriers of breast self-examination, benefits and barrier of mammography benefits, and benefits and barriers of clinical breast examination. The investigator also identified their current sources of acquiring information on breast cancer and breast cancer screening modalities, the respondents' intent on performing breast self-examination, submitting to mammography, and engaging in clinical breast examination. The respondents' preferred breast health educational platform was also identified in this study.

Data were collected with a survey that included questions to collect modifying variables (demographics), three descriptive questions based on current sources of information, intent for performing breast screening modalities, educational platform on breast health, Breast Cancer Knowledge Test, Champion's Revised Susceptibility, Seriousness of Breast Cancer and Barriers to Breast Cancer Screening Modalities scale, and Sunil et al.'s CBE questionnaire scale.

Study Participants

Filipino women living in the Philippines were recruited via the messaging feature of a social media platform. Recruitment commenced after IRB approval was obtained (see Appendix A) and completed until a total of 300 respondents were enrolled. The study survey link was sent to approximately 600 potential participants through their personal FB messenger. A total of 334 participants accessed the survey link; 18 of whom did not provide any information or opted not to give their consent to participate after accessing the survey link. In order to capture all the information that was provided by the participants, 316 surveys were included in the data analysis.

Data Cleaning

The survey results of 316 respondents were included in the data analysis. However, there were omitted responses in 136 of the surveys collected. For example, in the demographics section of the questionnaire, a total of 292 out of 316 respondents identified their specific age, and 24 chose not to. Similarly, in the history of breast cancer question, 300 (N = 316) indicated their choice while 16 opted not to make their history known. When reporting the data, both the total number of respondents who responded to the individual questions and those who omitted the responses were identified.

Descriptive Information

Description of the Sample

The modifying variables (demographic data) of the Philippine-based Filipino women were collected to describe their characteristics. The majority of the respondents were older than 20 years of age, married, and reported no personal and family history of breast cancer. Tables 1 and 2 present the summaries of the respondents' age, marital status, and family history of breast cancer. Table 3 presents the summary of the

respondents' educational and income levels, and place of residence while Table 4 is the respondents' sources of information on breast cancer and breast cancer screening modalities.

Table 1
Range, Mean, and Standard Deviation of the Respondents' Age

Age	Range of age	Mean	*SD*
Philippine-based Filipino women	18-81	38.97	13.13

Note: Mean ± standard deviation

Table 2
Summary of Respondents' Marital Status and Family History of Breast Cancer

Status	Number (%)
Marital status*	
Married	145 (63.3%)
Non-married	84 (36.7%)
Family history of breast cancer**	
No history	185 (80.4%)
Positive history	45 (19.6%)

Note: *N = 229. **N = 230

Most of the respondents are college graduates or had some college education, had an annual income above 10,000 pesos (approximately 200 USD), and resided in a town or municipality. The data also demonstrated that a little over a quarter of the total number of participants chose not to give information to the demographic questions.

Table 3
Summary of Respondents' Education Level, Income, and Place of Residence

Status	*n* (%)
Education Level	
Some high school	1 (0.3%)
High school graduate	9 (2.8%)
Some college	39 (12.3%)
College graduate	131 (41.5%)
Some graduate studies	19 (6.0%)
Masters or doctorate	29 (9.2%)
Missing	88 (27.8%)
Income	
Below Php 9,000	9 (2.8%)
Php 6,000 – 10,000	21 (6.6%)
Above Php 10, 000	197 (62.3%)
Missing *n*	89 (28.2%)
Residence	
Town/Municipality	113 (35.8%)
Small city	35 (11.1%)
Urban, Large city	82 (25.9%)
Missing *n*	86 (27.2%)

Note: N = 316.

Results of the survey for current sources of information indicated that most of the respondents preferred doctors as their primary source of obtaining information about breast cancer, breast self-examination, clinical breast examination, and mammography screening over all the other sources. However, the difference between those who chose doctors and those who chose the Internet was less than 1%. The next preferred sources were printed materials (books, brochures, magazines, and newspapers) followed by television, friends, nurse, relatives, BHCW/midwife, professional organizations, and radio. Pharmaceutical industry, company information drive, and self were individually reported by some of the respondents.

Table 4
Respondents' Current Sources of Information

Sources of information	Number (%)
Doctor	149 (65.6%)
Internet	147 (64.8%)
Printed materials	111 (48.9%)
TV	102 (44.9%)
Friends	91 (40.1%)
Nurse	64 (28.2%)
Relatives	61 (26.9%)
BHCW/Midwife	32 (14.1%)
Professional organizations	25 (11.0%)
Radio	16 (7.0%)

Note: N = 227. BHCW = Barangay Health Care Worker. TV = television.

Table 5 presents the results of the survey about the levels of knowledge for breast cancer and breast cancer screening modalities of the respondents showed that 114 of the respondents (52.55%, n = 219) had moderate level of knowledge, 91 of the respondents (41.55%, n = 219) were classified under the low-level category, and 14 (6.39%, n = 219) of the respondents belong to the high-level category.

Table 5
Respondents' Level of Knowledge of Breast Cancer and Breast Screening Modalities

Level of Knowledge	Frequency	%
High	14	6.39 %
Moderate	114	52.55%
Low	91	41.55%

Note: n = 219.

Reliability Testing and Descriptive Analysis

Reliability Testing

The reliability estimates of the survey tool for the variables of breast cancer knowledge, health beliefs/perceptions (RSSBM scale and Sunil et al.'s CBE scale) were

determined using SPSS Version 18 (2009). In this study, the interpretation of the Cronbach's alpha output followed the rule of George and Mallery (2008), which resulted in greater than .9 = Excellent, greater than .8 = good, greater than .7 = acceptable, greater than .6 = questionable, greater than. 5 = poor, and less than .5 = Unacceptable.

The Cronbach's alpha of each of the subscale that comprised the Champion's Revised Susceptibility, Seriousness of Breast Cancer and Barriers to Breast Screening Modalities were determined. The results included perceived susceptibility subscale with Cronbach's alpha of .904, perceived severity subscale .732, barriers to BSE subscale .853, benefits to BSE subscale .782, barriers to mammography subscale .891, and benefits to mammography .744. For Sunil et al.'s benefits and barriers to clinical breast examination scale the Cronbach's alpha is .804 and .921, respectively. All values of Cronbach's alpha showed confirmation of the consistency and reliability of all the survey tools used in this study and were consistent with McCance et al. (1990), Champion (1993), and Sunil et al. (2014).

To measure overall test reliability of the Breast Cancer Knowledge Test, the Kuder-Richardson (K-R 20) was performed that yielded a Cronbach's alpha of .756. This value indicates that BCKT items have strong relationship and are therefore reliable.

Measures of frequency were the descriptive statistics used for the collected data about the participants' intent to perform BSE, submit for mammography screening, and engage in clinical breast examination within the next year. It was also used to determine the respondents' preferred educational platform for breast health.

Descriptive Analysis

Intent to perform BSE, submit for mammography, and CBE. One hundred seventy three (83.17%, *n* = 208) of the respondents indicated that they will perform BSE in the next year while 35 (16.83%, *n* = 208) indicated that they do not intend to perform BSE in the next year. For the intent to engage in clinical breast examination, 129 of the respondents (67.19%, *n* = 192) indicated they intend to engage in clinical breast examination while 63 of the respondents (32.81%, *N* = 192) indicated that they do not intend to engage in clinical breast examination. For screening mammography, 123 of the respondents (64.06%, *n* = 192) intended to submit to screening mammography while 69 (36.46%, *n* = 192) of the respondents indicated they do not intend to submit to screening mammography.

As shown in Table 6, among the three screening modalities, most of the respondents were inclined to perform breast self-examination within the next year. Between screening mammography and CBE, most respondents intend to engage in CBE than submit to screening mammography.

Table 6
Summary for the Respondents' Intent to Perform BSE, Submit to Mammography, and Engage in CBE

Intent	Number (%)
BSE*	
Yes	123 (64.06%)
No	35 (16.83%)
Mammography**	
Yes	123 (64.06%)
No	69 (35.94%)
CBE***	
Yes	129 (67.19%)
No	63 (32.81%)

Note: **N* = 208. ***N* = 192. ****N* = 192. BSE = Breast self-examination. Mammo = Mammography. CBE = Clinical breast exam.

Preferred educational platform for breast health. As to the preferred educational platform survey, the findings showed that the Internet or Web-based information was the most preferred educational platform by 168 (376.01%, *N* = 221) of the respondents. The printed materials, such as flyers, brochures, and handouts, are preferred methods by 108 (48.87 %, *N* = 221) respondents. Seminar-type of instruction and face-to-face formal instruction were preferred by 108 (48.87%, *N* = 221), and 92 (41.63%, *N* = 221) respectively. Radio or television programs as an educational platform for disseminating information about breast cancer and breast cancer screening modalities was chosen by 72 (32.56%, *N* = 221) of the respondents. Three respondents specified that they preferred education be delivered during annual physical examination, and actual observations from those who had actually had the disease.

Responses to the Measurements

The respondents were requested to respond to a total of 98-item survey questionnaire that included questions to collect modifying variables/demographics (age, marital status, personal and family history of breast cancer, educational and income levels, and place of residence), the McCance Breast Cancer Knowledge Test, Champion Revised Susceptibility, Seriousness of Breast Cancer and Barriers to Screening Modalities, and Sunil et al.'s Clinical Breast Examination scale. The descriptive questions inquired as to the respondents' current sources of information about breast cancer and breast screening modalities, their intent of performing BSE, submitting to screening mammography, engaging in clinical breast examination in the next year, and their preferred educational platform for breast health.

The McCance Breast Cancer Knowledge Test consisted of 19 items. Item questions that were left blank were omitted in the analysis. The mean BCKT score of the respondents was 59.21 with standard deviation (*SD*) of 21.96, and range of 17. The highest mean response emerged on Question 3: How much difference does regular breast cancer screening make in the chance of curing breast cancer? (183 correct responses, 83.6%) while the lowest mean response emerged on Question 8: Mammography is recommended every 2 years for women 50 years and over (56 correct responses, 25.6%). See Appendix I for the BCKT summary. Table 7 presents the overall mean, range, and standard deviation of the level of knowledge of the respondents for breast cancer and breast cancer screening modalities.

Table 7
Breast Cancer and Breast Cancer Screening Modalities Knowledge of the Participants

	Overall mean	Range	Standard deviation
BCKT	59.21	17	21.96

Note: BCKT-Breast Cancer Knowledge Test.

Champion Revised Susceptibility, Seriousness of Breast Cancer and Barrier to Breast Screening Modalities survey questionnaire was also given to the respondents to collect data about their perceptions on susceptibility, seriousness of breast cancer, and barriers to breast screening modalities. This survey is a five-point Likert survey questionnaire, and the 54 questions were distributed among the following eight constructs: five questions for Perceived Susceptibility to Breast six questions for Perceived Benefits of Breast Self-Examination (BenBSE), six questions for Perceived Barriers to Breast Self-Examination (BarBSE), five questions for Perceived Benefits of

Mammography (BenM), and 11 questions for Perceived Barriers to Mammography (BarM). Reverse coded questions were recoded before data analysis.

The highest mean response (M = 3.55, SD = 0.62) emerged for Perceived Benefits of Mammography. The lowest mean response (M = 2.09, SD = 0.68) emerged for Perceived Barriers of Breast Self-Examinations. Table 8 presents the means and standard deviations for each construct of the RSSBM scale.

Table 8
Revised Susceptibility, Benefits, and Barrier Scale Means and Standard Deviations

Variables (constructs)	Mean	Standard deviation
SusBC	2.24	0.81
SerBC	3.16	0.74
BenBSE	3.53	0.68
BarBSE	2.09	0.68
BenMam	3.55	0.62
BarMam	2.52	0.68

Note: SusBC = Susceptibility Breast Cancer. SerBC = Seriousness of Breast Cancer. BenBSE = Benefits of Breast Self-Examination. BarBSE = Barriers to Breast Self-Examination. BenMam = Benefits of Mammography. BarMam = Barriers to Mammography.

Sunil et al.'s Clinical Breast Examination Questionnaire was given to the respondents to gather data about their perceptions for the perceived benefit and barriers to Clinical Breast examination. This survey questionnaire has one question for Perceived Benefit of Clinical Breast Examination, and 14 questions for Perceived Barriers to Clinical Breast Examination. Respondents submitted their responses to this questionnaire on a five-point Likert scale. The reported mean for Barriers to CBE was 2.45 (SD = 0.73), which is higher compared with the mean of Benefits of CBE, which is 2.29 (SD = 0.82). This result is presented in Table 9 below.

Table 9
Sunil et al.'s Clinical Breast Examination Scale Mean and Standard Deviations

Constructs	Mean	Standard deviation
BenCBE	2.29	0.82
BarCBE	2.45	0.73

Note: BenCBE = Benefits to Clinical Breast Examination. BarCBE = Barriers to Clinical Breast Examination

Hypothesis Testing

Pearson correlation coefficient (Pearson's r) was used to measure the linear correlation between the respondents' level of knowledge about breast cancer and breast cancer modalities and their frequency of performing breast self-examination**.** This test was used to show the association between the two variables (Salkind, 2005).

The investigator used direct standard logistic regression to determine the nine predictors (BCKT, SusBC, SerBC, BenBSE, BarBSE, BenMam, BarMam, BenCBE, and BarCBE) to predict respondents' intent to perform BSE, submit to mammography, and engage in CBE within the next year. Logistic regression analysis was used for analyzing a data set in which there were one or more independent variables that determine an outcome. The outcome is measured with a dichotomous variable (Meyers, Gamst, & Guarino, 2013) as is in the case in this study. The binary logistic regression using SPSS version 23 was specifically performed to ascertain the predictive ability of the respondents' 7 modifying factors (age, marital status, educational level, income level, family history of breast cancer, place of residence, and sources of information) and the respondents' intent to perform BSE, submit to screening mammography, and engage in CBE. Binary logistic regression was the static test of choice in this study because the outcome variable has only two categories, YES or No and there were multiple

independent variables represented by the respondents' modifying factors (Meyers, et al., 2013; Pallant, 2013).

Hypothesis 1 stated the following: The level of knowledge of the Philippine-based Filipino women about breast cancer and breast screening modalities and their frequency of performing BSE have significant relationship. This hypothesis demonstrates that knowledge of breast cancer and breast cancer screening will correlate significantly with the frequency of performing BSE by the respondents. The correlation between knowledge level for breast cancer and breast screening results and frequency of performing BSE was found to be statistically significant r (.436) = .000, $p < .01$, two-tailed. Therefore, the null hypothesis is rejected in favor of the alternative. Table 10 presents the relationship between the level of breast cancer knowledge and frequency of performing BSE.

Table 10
Relationship Between Level of Breast Cancer Knowledge and Frequency of Performing BSE

		Level of BCK	BSE frequency
BCK level	Pearson Correlation	1	.436**
	Sig. (2-tailed)	219	.000
	N		219
BSE frequency	Pearson Correlation	.436**	1
	Sig. (2-tailed)	.000	
	N	219	219

Note: BCK= breast cancer knowledge. BSE = breast self-exam.
**correlation significant at .01 level (2-tailed).

Hypothesis 2 stated the following: Philippine-based Filipino women's breast cancer related knowledge, perceptions/health beliefs (RSSBM scale: susceptibility, seriousness, benefits, and barriers) about breast cancer and breast cancer screening modalities, modifying variables (age, marital status, educational level, income level, family history,

place of residence, and source of information) are significant predictors of their intent to perform BSE, submit to screening mammography, and engage in clinical breast examination. In this hypothesis, the investigator posited that these variables will act as the "push" factors that will move the respondents to take positive action towards their breast health by their intent to perform BSE, screening mammography, and engaging in CBE within the next year.

A direct logistic regression analysis was performed on intent to perform a BSE as the outcome of nine predictors: Breast Cancer Related Knowledge test score, mean score for perceived susceptibility to breast cancer (SusBC), mean score for the perceived seriousness of breast cancer (SerBC), perceived benefits of breast self-examinations (BenBSE), perceived barriers to breast self-examinations, perceived benefits of mammography, perceived barriers to mammography, perceived benefits of clinical breast examinations, and perceived barriers to clinical breast examinations. After deletion of 149 cases with missing values, data from $n = 167$ respondents was available for analysis: 141 (84.4%) respondents classified as intending to conduct a BSE within the next year, and 26 (15.6%) respondents classified as not intending to conduct a BSE within the next year. Missing data appeared to be scattered randomly across categories of outcome and predictors and did not significantly change the percentage of respondents classified as intending or not intending to conduct BSE within the next year. Analysis was performed using R (R Core Team, 2015).

A test of the full model with all nine predictors against a constant-only model was statistically reliable, $\chi^2 (10) = 46.9$, $p < .001$, indicating that the set of predictors did not reliably distinguish between those who did and did not intend to conduct BSE within the

next year. The variance accounted for is excellent with McFadden's rho = .25, *df* = 11. Prediction success (using 0.5 as the threshold) was impressive with 149 of 167 cases (89.2%) accurately classified or predicted correctly with sensitivity and specificity values of 0.38 and 0.99, respectively.

Table 11 shows regression coefficients, Wald statistics, odds ratios, and 95% confidence intervals for odds ratios for each of the nine predictors. According to the Wald criterion, BCKT score and mean response on the barriers to clinical breast examination reliably predicted intent to perform a BSE, $z = 2.21$, $p < .05$, $z = -2.09$, $p < .05$, respectively. The odds ratios of 1.03 and 0.19 indicated moderate change in the likelihood of conducting a BSE in the next year on the basis of a one-unit change in BCKT and average of BarCBE, respectively. Variance Inflation Factors (VIFs) ranged from 1.33 (SusBC) to 3.56 (BarMam), indicating that multicollinearity was not a problem. Examination of the significance levels of the additional predictors created by examining the interaction between each predictor and the log of itself (Hosmer & Lemeshow, 1989) indicated that a linear relationship between the predictor variables and the logit of intent to perform a BSE may be assumed.

Based on the standard logistic regression findings, knowledge about breast cancer and barriers to clinical breast examination are the two variables that predicted the respondents' intent to perform breast self-examination in the next year. Findings also indicated that the variables of susceptibility, seriousness, benefits to BSE, barriers to BSE, benefits and barriers to mammography, and benefits to CBE can be putative predictors of the respondents' intent to perform BSE in the next year. Therefore, the null hypothesis is rejected in favor of the alternative.

Table 11
Logistic Regression Analysis of Intent to Perform BSE

Variables	*B*	Wald (z-ratio)	Odds ratio	*p* value	95% CI Lower	95% CI Upper
BCKT	0.034	2.207	1.034	.027*	1.004	1.067
SusBC	0.427	1.341	1.533	.180	0.831	2.936
SerBC	-0.443	-1.004	0.366	.316	0.266	1.533
BenBSE	-0.138	-0.277	0.758	.782	0.318	2.280
BarBSE	0.588	1.177	3.245	.239	0.676	4.865
BenMam	0.220	0.456	1.578	.649	0.487	3.283
BarMam	-0.345	-0.441	0.643	.659	0.148	3.274
BenCBE	0.443	1.252	3.497	.210	0.796	3.242
BarCBE	-1.636	-2.090	0.124	.037*	0.038	0.832
(CONSTANT)	3.188	1.211	3.357	.226	0.166	5263.793

Note: BCK= breast cancer knowledge. BSE= breast self-exam. SusBC = Susceptibility Breast Cancer. SerBC = Seriousness of Breast Cancer. BenBSE = Benefits of Breast Self-Examination. BarBSE = Barriers to Breast Self-Examination. BenMam = Benefits of Mammography. BarMam = Barriers to Mammography. *$p < .05$.

A significant relationship has emerged between Philippine-based Filipino women's breast cancer related knowledge and their perceptions and health beliefs (susceptibility, seriousness, barriers and benefits to BSE, barriers and benefits to mammography, and barriers and benefits to CBE) and their intent to seek a mammography.

On average, respondents who intended to perform a mammography scored higher on the BCKT ($M = 65.41$, $S = 20.40$) than respondents who did not intend to perform a

mammography (M = 53.03, S = 20.04). The difference was significant $t(108.4) = -3.60$, $p < .001$. The difference represented a medium-sized effect, $r = .33$.

A direct logistic regression analysis was performed on intent to perform a mammography as the outcome with nine predictors: Breast Cancer Related Knowledge test score, mean score on perceived susceptibility to breast cancer, mean score on the perceived seriousness of breast cancer, perceived benefits of breast self-examinations, perceived barriers to breast self-examinations, perceived benefits of mammography, perceived barriers to mammography, perceived benefits of clinical breast examinations, and perceived barriers to clinical breast examinations. After deletion of 165 cases with missing values, data from n = 151 respondents was available for analysis: 98 (64.9%) respondents were classified as intending to conduct a mammography within the next year, and 53 (35.1%) respondents were classified as not intending to conduct a mammography within the next year. Missing data appeared to be scattered randomly across categories of outcome and predictors and did not significantly change the percentage of respondents classified as intending or not intending to conduct a mammography within the next year. Analysis was performed using R (R Core Team, 2015).

A test of the full model with all nine predictors against a constant-only model was statistically reliable, χ^2 (10) = 31.8, $p < .001$, indicating that the set of predictors reliably distinguished between those who did and did not intend to conduct a mammography within the next year. The variance accounted for was low with McFadden's rho = .17, df = 10. Prediction success (using 0.5 as the threshold) was moderate with 112 of 151 cases

(74.2%) accurately classified or predicted correctly with sensitivity and specificity values of 0.51 and 0.87, respectively.

Table 12 displays the regression coefficients, Wald statistics, odds ratios, and 95% confidence intervals for odds ratios for each of the nine predictors. According to the Wald criterion, only perceived barriers to mammography has emerged as a reliable predictor of the intent to submit to screening mammography, $z = -3.15$, $p < .01$. The odds ratio of 0.13 indicates a very large change in the likelihood of conducting a mammography in the next year on the basis of a one-unit change in BarMam. Variance Inflation Factors ranged from 1.09 (SusBC) to 3.76 (BarMam), indicating that multicollinearity was not a problem. Examination of the significance levels of the additional predictors created by examining the interaction between each predictor and the log of itself (Hosmer & Lemeshow, 1989) indicated that a linear relationship between the predictor variables and the logit of intent to perform a mammography may be assumed.

The subscale barriers to mammography was found to be the sole predictor of the respondents' intent to submit to screening mammography within the next year based on the findings of the standard logistic regression analysis. The predictive ability of the remaining variables of susceptibility, seriousness, benefits and barriers to BSE, benefits to mammography, and benefits and barriers to CBE can only be assumed as demonstrated by the findings. Therefore, the null hypothesis is rejected in favor of the alternative.

Table 12
Logistic Regression Analysis of Intent to Submit to Screening Mammography

Variables	*B*	Wald (z-ratio)	Odds ratio	*p* value	95% CI Lower	95% CI Upper
BCKT	0.02	1.57	1.02	.116	1.00	1.04
SusBC	0.39	1.57	1.48	.116	0.92	2.46
SerBC	0.38	1.13	1.47	.259	0.76	2.90
BenBSE	-0.39	1.13	0.68	.286	0.32	1.36
BarBSE	0.80	1.90	2.23	.058	1.00	5.26
BenMam	0.15	0.39	1.16	.693	0.56	2.45
BarMam	-2.03	-3.15	0.13	.01**	0.03	0.44
BenCBE	0.09	0.31	1.09	.760	0.61	1.97
BarCBE	-0.14	-0.28	0.87	.782	0.32	2.36
(CONSTANT)	2.05	1.01	7.78	.310	0.16	482.43

Note: BCK= breast cancer knowledge. BSE = breast self-exam. SusBC = Susceptibility Breast Cancer. SerBC = Seriousness of Breast Cancer. BenBSE = Benefits of Breast Self-Examination. BarBSE = Barriers to Breast Self-Examination. BenMam = Benefits of Mammography. BarMam = Barriers to Mammography. ** $p < .01$.

A significant relationship has emerged between Philippine-based Filipino women's breast cancer related knowledge and their perceptions and health beliefs (susceptibility, seriousness, barriers and benefits to BSE, barriers and benefits to mammography, barriers and benefits to CBE) with their intent to perform a CBE.

On average, respondents who intended to perform a CBE scored higher on the BCKT ($M = 66.29$, $S = 19.26$) than respondents who did not intend to perform a CBE ($M = 51.29$, S = 20.27). The difference was significant $t(83.91) = -4.27$, $p < .001$. The difference represents a medium-sized effect, $r = .42$.

A direct logistic regression analysis was performed on intent to perform a CBE as the outcome with nine predictors: Breast Cancer Related Knowledge test score, mean score on perceived susceptibility to breast cancer, mean score on the perceived seriousness of breast cancer, perceived benefits of breast self-examinations, perceived barriers to breast self-examinations, perceived benefits of mammography, perceived

barriers to mammography, perceived benefits of clinical breast examinations, and perceived barriers to clinical breast examinations. After deletion of 163 cases with missing values, data from n = 153 respondents was available for analysis: 106 (69.3%) respondents were classified as intending to engage in CBE within the next year, and 47 (30.7%) respondents were classified as not intending to engage in CBE within the next year. Missing data appeared to be scattered randomly across categories of outcome and predictors and did not significantly change the percentage of respondents classified as intending or not intending to engage in CBE within the next year. Analysis was performed using R (R Core Team, 2015).

A test of the full model with all nine predictors against a constant-only model was statistically reliable, χ^2 (10) = 36.1, $p < .001$, indicating that the set of predictors reliably distinguished between those who did and did not intend to conduct a CBE within the next year. The variance accounted for is very good with McFadden's rho = .25, df = 10. Prediction success (using 0.5 as the threshold) was impressive with 121 of 153 cases (79.1%) accurately classified or predicted correctly with sensitivity and specificity values of 0.57 and 0.89, respectively.

Table 13 displays the regression coefficients, Wald statistics, odds ratios, and 95% confidence intervals for odds ratios for each of the nine predictors. According to the Wald criterion, perceived barriers to breast self-examinations) and perceived barriers to mammography reliably predicted the intent to engage in CBE, z = 2.66, $p < .01$, z = -3.16, $p < .01$, respectively. The odds ratios of 3.31 and 0.1 indicate a large change in the likelihood of engaging in CBE in the next year on the basis of a one-unit change in BarBSE and BarMam, respectively. Variance Inflation Factors (VIFs) ranged from 1.09

(SusBC) to 3.61 (BarMam), indicating that multicollinearity is not a problem. Examination of the significance levels of the additional predictors created by examining the interaction between each predictor and the log of itself (Hosmer & Lemeshow, 1989) indicated that a linear relationship between the predictor variables and the logit of intent to perform a CBE may be assumed.

Barriers to BSE and barriers to mammography were found to be significant predictors of the respondents' intent to engage themselves to CBE within the next year. The other variables of breast cancer knowledge, susceptibility, seriousness, benefits to BSE and mammography, and benefit and barriers to CBE were found not to significantly predict the respondents' intent to submit themselves to CBE within the next year. Therefore, the null hypothesis is rejected in favor of the alternative.

Table 13
Logistic Regression Analysis of Intent to Engage in CBE

Variables	*B*	Wald (z-ratio)	Odds ratio	*p* value	95% CI Lower	95% CI Upper
BCKT	0.02	1.92	1.02	.055	1.00	1.05
SusBC	0.21	0.79	1.24	.429	0.74	2.12
SerBC	0.10	0.27	1.11	.790	0.53	2.35
BenBSE	-0.07	-0.17	0.93	.863	0.42	2.01
BarBSE	1.20	2.66	3.31	.01**	1.40	8.27
BenMam	0.46	1.10	1.58	.274	0.71	3.66
BarMam	-2.24	-3.16	0.11	.01**	0.02	.40
BenCBE	0.26	0.89	1.30	.385	0.72	2.40
BarCBE	-0.37	-0.64	0.69	.525	0.21	2.14
(CONSTANT)	0.98	0.46	2.66	.649	0.04	204.05

Note: BCK = breast cancer knowledge. BSE = breast self-exam. SusBC = Susceptibility Breast Cancer. SerBC = Seriousness of Breast Cancer. BenBSE = Benefits of Breast Self-Examination. BarBSE = Barriers to Breast Self-Examination. BenMam = Benefits of Mammography. BarMam = Barriers to Mammography. $^{**}p < .01$.

A significant relationship has emerged between Philippine-based Filipino women's modifying variables (age, marital status, educational level, income level, place of residence, family history of breast cancer, and sources of information) with their intent to perform BSE.

A standard binary logistic regression was performed to model the binary variable of the respondents' intent to perform a BSE. The predictor variables in this study are the modifying variables of the respondents: age, marital status, educational level, income level, place of residence, family history of breast cancer, and sources of information. Based on the predicted probability of .5, results of the logistic analysis indicated that the two predictor models did not provide a statistically significant prediction of intent to perform BSE, X^2 (5, N =196) = 5.434, $p < .001$. The Nagelkerke R^2 indicated that the model accounted between 2.7% and 4.5% of the variance in the dependent variable (intent to perform BSE), which is explained by the independent variables (modifying factors) in the model. Table 14 presents the partial regression coefficients, the Wald test, odds ratio Exp (*B*), Sig *(p* value), and the 95% confidence intervals (CI) for odd ratios for each predictor.

The findings indicated that the modifying variables (age, marital status, educational level, income level, place of residence, family history of breast cancer, and sources of information) do not have predictive ability of the respondents' intent to perform BSE within the next year. Income level ($p = .255$) and family history of breast cancer ($p = .256$) are the only variables that approached the significant level thus, maybe considered to exert influence in the respondents' intent to perform BSE with a large sample size. The null hypothesis failed to be rejected.

Table 14
Logistic Regression Analysis of Intent to Perform BSE

Variable	*b*	SE *b*	Wald	*df*	Sig	Exp (B)	95% CI Exp (B)
Age	0.011	0.017	0.482	1	.487	1.012	[0.979, 1.045]
MS	0.091	0.429	0.045	1	.832	1.095	[0.472, 2.541]
Ed level	-0.157	0.439	0.128	1	.720	0.854	[0.361, 2.021
Inc level	-0.900	0.790	1.297	1	.255	0.407	[0.086, 1.1913]
PlofRes	0.140	0.215	0.423	1	.516	1.150	[0.754, 1.754]
FamHxBC	0.667	0.587	1.292	1	.256	1.948	[0.617, 6.150]
SrcofInfo	-0.270	0.430	0.395	1	.530	0.763	[0.329, 1.772]
Constant	2.202	1.381	2.543	1	.111	9.040	

Note: MS-Marital Status; Ed Level-educational level; Inc Level-income level; PlofRes-Place of residence; FamHxBC-Family History of Breast Cancer; SrcofInfo-source of information

A significant relationship has emerged between Philippine-based Filipino women's modifying variables (age, marital status, educational level, income level, place of residence, family history of breast cancer, and sources of information) with their intent to submit to screening mammography.

A standard binary logistic regression was performed to model the binary variable of the participants' intent to submit to screening mammography. The predictor variables are the modifying variables of the participants' age, marital status, educational level, income level, place of residence, family history of breast cancer, and sources of information. Based on the predicted probability of .5, results of the logistic analysis indicated that the two predictor models did not provide a statistically significant prediction of intent to submit to mammography, X^2 (5, N = 180) = 7.221, $p < .001$. The Nagelkerke R^2 indicated that the model accounted between 3.9% and 5.4% of the variance in the dependent variable (intent to submit to mammography), which is explained by the independent variables (modifying factors) in the model. Table 15

presents the partial regression coefficients, the Wald test, odds ratio Exp (*B*), Sig *(p* value), and the 95% confidence intervals (CI) for odd ratios for each predictor.

The findings indicated that the modifying variables (age, marital status, educational level, income level, place of residence, family history of breast cancer, and sources of information have no predictive ability in the respondents' intent to submit to mammography within the next year. Marital status (p = .149) is the only significant (p value of .01) and maybe considered to exert influence in the respondents' intent to submit to screening mammography. The null hypothesis is rejected in favor of the alternative.

Table 15
Logistic Regression Analysis of Intent to Submit to Screening Mammography

Variable	*b*	SE *b*	Wald	*df*	Sig	Exp (B)	95% CI Exp (B)
Age	.002	0.003	0.439	1	.508	1.002	[0.996, 1.007]
MS	-.508	0.352	2.083	1	.149	0.601	[0.302, 1.200]
Ed level	-.387	0.352	1.157	1	.282	0.679	[0.336, 1.200]
Inc level	.651	0.541	1.445	1	.229	1.917	[0.663, 5.541]
PlofRes	.073	0.181	0.163	1	.687	1.076	[0.755, 1.533]
FamHxBC	.028	0.418	0.449	1	.500	1.333	[0.578,3.073
SrcofInfo	-.038	0.403	0.009	1	.963	1.323	[0.437, 2.123]
Constant	.983	1.068	0.848	1	.357	2.673	

Note: MS = marital status. Ed level = educational level. Inc level = income level. PlofRes = place of residence. FamHxBC = family history of breast cancer. SrcofInfo = source of information.

A significant relationship has emerged between Philippine-based Filipino women's modifying variables (age, marital status, educational level, income level, place of residence, family history of breast cancer, and sources of information) with their intent to engage in CBE.

A standard binary logistic regression was performed to model the binary variable of the participants' intent to engage to CBE. The predictor variables are the modifying variables of the participants' age, marital status, educational level, income level, place of

residence, family history of breast cancer, and sources of information. Based on the predicted probability of .5, results of the logistic analysis indicated that the two predictor models did not provide a statistically significant prediction of intent to engage to CBE, X^2 (5, N = 181) = 8.447, $p < .001$. The Nagelkerke R^2 indicated that the model accounted between 4.6% and 6.3% of the variance in the dependent variable (intent to engage in CBE), which is explained by the independent variables (modifying factors) in the model. Table 16 presents the partial regression coefficients, the Wald test, odds ratio Exp (*B*), Sig *(p* value), and the 95% confidence intervals (CI) for odd ratios for each predictor.

The findings indicated that the modifying variables (age, marital status, educational level, income level, place of residence, family history of breast cancer, and sources of information) have no predictive ability in the respondents' intent to engage in CBE within the next year. The null hypothesis failed to be rejected. Family history of breast cancer (p = .097) is the only variable that approached the p = .05 and thus maybe considered to be predictive of the respondents' intent to engage in CBE with a bigger sample size.

Table 16
Binary Logistic Regression Results of Intent to Engage in CBE

Variable	*b*	SE *b*	Wald	*df*	Sig	Exp (B)	95% CI Exp (B)
Age	0.001	0.003	0.165	1	.685	1.001	[0.996, 1.007]
MS	-0.244	0.354	0.477	1	.490	0.738	[0.392, 1.566]
Ed level	-0.069	0.356	0.036	1	.850	0.933	[0.457, 1.907]
Inc level	-0.802	1.390	1.390	1	.238	0.448	[0.118, 1.701]
PlofRes	-0.070	0.149	0.149	1	.700	0.932	[0.654, 1.330]
FamHxBC	0.767	2.756	2.756	1	.097	2.154	[0.871, 5.329]
SrcofInfo	-0.307	0.602	.0602	1	.438	0.735	[0.338, 1.599]
Constant	2.058	3.188	3.188	1	.074	7.828	

Note: MS = marital status. Ed level = educational level. Inc level = income level. PlofRes = place of residence. FamHxBC = family history of breast cancer. SrcofInfo = source of information.

Chapter Summary

This chapter presented the report of the results of the data analysis for this quantitative study. The purpose of this study was to determine the level of knowledge of Philippine-based Filipino women; the relationship of their level of knowledge; frequency with which they performed BSE; their current sources of information; preferred educational platform for breast health; the predictive ability of their health beliefs/perceptions; and their modifying variables for their intent to perform BSE, submit to screening mammography, and engage in CBE.

The McCance BCKT questionnaire was used to gather data about the respondents' level of knowledge, while Champion RSSBM and Sunil et al.'s CBE scales were used to collect data for the respondents' health beliefs/perceptions. The respondents' modifying variables, current sources of information, and preferred educational platform were also identified. The collected data were analyzed using frequencies, Pearson-correlation, direct logistic regression, and binary logistic regression.

Results of the statistical analyses indicated that the respondents of the present study were mostly over the age of 20, married, college educated, belonged to the middle income class, lived in urban areas, and most had no family history of breast cancer. The respondents' level of knowledge about breast cancer and breast cancer screening modalities were classified as moderate. Results of this study showed that there is a significant relationship between the respondents' level of knowledge and their frequency of breast self-examination. The null hypothesis for this research question failed to be rejected. The doctor and the use of the Internet were considered by the respondents as

their primary sources of information on breast cancer and breast cancer screening modalities. The nurse and the Barangay health care worker/midwife were chosen by less 50% of the respondents. Accordingly, the respondents preferred the Internet or Web-based format as the educational platform for delivery of information about breast cancer and breast health.

The respondents' knowledge about breast cancer and breast cancer screening modalities, and their health beliefs/perceptions for barriers to BSE, mammography, and CBE were found to be predictive of their intent to perform BSE, submit to screening mammography, and engage in CBE. The null hypothesis was rejected in favor of the alternative. It is interesting to note that susceptibility to and seriousness of breast cancer, benefits of BSE and mammography, and benefits to CBE were not found to be predictive of the respondents' intent to perform BSE, submit to screening mammography, and engage in CBE. The respondents' modifying variables of age, educational level, income level, place of residence, family history of breast cancer, and sources of information were found not to be predictive of the respondents' intent to perform BSE, submit to screening mammography, and engage in CBE. The null hypothesis for this research problem was failed to be rejected. However, the variables of family history of breast cancer, marital status, and income level approached the significance level and may have predictive ability with large sample size.

Chapter 5

Discussion and Summary

In the Philippines**,** breast cancer is the number one malignancy among women (Laudico et al., 2010) with a reported increased rate of up to 5.2% between 1993 to 2003 (Kim et al., 2015) and a five-year survival rate of only 58 to 59% (Kim et al., 2015). It is projected that 1 in every 13 Filipino women will develop breast cancer in her lifetime (Trieu, Mello, Thoms, & Brennan, 2015). This alarming trend was aptly captured in Meneses' speech delivered during the 1999 World Conference on Breast Cancer in Ottawa, Canada. Meneses (1999) claimed that being born in a developing country poses a great risk of contracting breast cancer. She further stated that being a woman in the Philippines is a big risk factor for not surviving cancer (Meneses, 1999). The literature had a scant number of studies that involved Philippine-based Filipino women as participants or subjects of research studies. The dissertation study is the first study of this nature to be conducted.

The purpose of this study was to investigate the knowledge level of Philippine-based Filipino women about breast cancer; their health beliefs; breast cancer behaviors by measuring their perceived susceptibility, severity/seriousness, benefits and barriers of breast self-examination, benefits and barriers of clinical breast examination and mammography; their intent to perform BSE; submit to screening mammography; and engage in CBE. The predictive ability of the respondents' modifying variables (age,

educational level, income level, place of residence, family history of breast cancer, and sources of information) were also ascertained. The investigator identified their current sources of acquiring information on breast cancer, breast cancer screening methods, breast health, and preferred breast health educational platform.

The dissertation study was anchored with the health belief model. HBM is both a psychosocial model (Champion, 1993) and a behavior theory (McEwen & Willis, 2014) that is utilized to explain health behaviors based on the concepts of susceptibility, seriousness, barriers, benefits, health motivation, and confidence (Hayden, 2014). HBM is also known as value-expectancy behavior that is fundamentally based on the premise that an individual's desire to avoid illness, coupled with a belief that a particular health action would avert the onset of the illness, can be interpreted and explained in relation to a number of diseases (Rosenstock, 1974), including breast cancer. In the dissertation study, it was hypothesized that the level of knowledge about breast cancer and breast cancer screening modalities, health perceptions/beliefs (perceived susceptibility, severity/seriousness, benefits and barriers of breast self-examination, benefits and barriers of clinical breast examination and mammography), and respondents' modifying variables (age, educational level, income level, place of residence, family history of breast cancer, and sources of information) may exert certain degree of influence on their intent to perform BSE, submit to screening mammography, and engaging in CBE. The Breast Cancer Knowledge Test by McCance et al. (1990), Champion's (1999) Revised Susceptibility, Benefits and Barriers Scale for Mammography, and Sunil et al.'s (2014) Clinical Breast Examination Questionnaire were the survey tools used to gather data. Data on the respondents' modifying variables (age, educational level, income level, place

of residence, family history of breast cancer, and sources of information) were also collected. The results of the dissertation study supported the theoretical framework.

Summary of the Findings

This study is the first study that dealt with Philippine-based Filipino women as the focus of the study and their level of knowledge about breast cancer; breast cancer screening modalities; frequency of performing BSE; their health beliefs/perceptions of this disease; their intent to perform BSE, submit to screening mammography, and engage in clinical breast examination within the next year; their current sources of information; and preferred educational approaches on breast health.

In this section, synthesis and integration of the findings with previous literature is presented. Studies about Philippine-based Filipino women and breast cancer were limited. The investigator was not able to find more recent studies on the topic. Therefore, older studies were cited in the discussion of integration of findings with previous literature.

Modifying Variables (Demographic Profile)

The study results showed that the mean age of the respondents was approximately 39 years old, which can be considered as young. Most of them resided in urban areas, are highly educated, married, and belonged to middle income families. Individuals belonging to the younger generation are more adept in the use of the popular social media platform, which was used to collect data for this study. The questionnaires were delivered in the English language, which may be the reason why most of those who accessed the study link had college education. Income level and living in urban areas were the variables that may have enabled the respondents to access the study link via the Internet. Accessing the

Internet involved some cost for data usage and some of the respondents may have only certain amount of data (load) for a certain period of time. This factor may have prevented them to complete the study questionnaire in its entirety or in a timely fashion. Internet connections are more reliable in the urban areas than in rural areas which made it easier for respondents living in the urban areas to access the study link.

Integration of the Findings with Previous Literature for Level of Knowledge

The chances of contracting breast cancer increase with advancing age (Dulanas, 2015). The mean age of the respondents of this study placed them at high risk for developing breast cancer in several years. It was projected by the Philippine Society of Medical Oncology that three out of 100 Filipino women living in the Philippines will contract breast cancer before age 75, and one out of 100 will die from breast cancer before age 75 (Asia News Monitor, 2015). Ngelangel and Wang (2002) reported that the peak incidence of breast cancer for Filipino women has decreased from 47 years old from 1991 to 1998 period to 44 years old from 1997-2000 period. Laudico et al. (2010) reported that the median age among Asian women at time of breast cancer diagnosis is 49-50 years old. They also reported that the upward trend of breast cancer incidence rate among Filipino women starts at age 30 (Laudico et al., 2010). In the study of Simpson, Briggs, & George (2015) Filipino women in Canada were diagnosed with breast cancer at a younger age of 53 years old compared with Asian women at 55 years old and Caucasian women at 58 years old.

Knowledge level of the participants' about breast cancer and breast cancer screening modalities. The knowledge level of the respondents on breast cancer and breast cancer screening modalities was categorized as moderate. There are implications

that the respondents may have a good grasp of breast cancer and screening modalities which they may have acquired from various resources some of which may not offer accurate information. In addition, Philippine-based Filipino women can gain access to information on breast cancer and breast cancer screening modalities through the Internet. Access to information through the internet has become easier for most Filipino women in recent years.

Knowledge is a necessary component for early detection; lack of basic knowledge about breast cancer and breast cancer screening modalities can negatively affect the outcomes of breast health for women (Ramathuba et al., 2015). In 2008, the Philippine Council for Health and Research Development reported that Filipino women have low level of knowledge on breast cancer. This finding is in contrast with the findings of the dissertation study in which it was found that the Philippine-based Filipino women possess moderate level of knowledge about breast cancer and breast cancer screening modalities**.** The increase in the level of knowledge of the Philippine-based Filipino women may be attributed to the accessibility of the information in the Internet. Moreover, most of the respondents were college graduates and may have had more exposure to educational materials about breast cancer through their place of studies or workplaces.

Sources of Information and Preferred Educational Platform

The primary sources of information about breast cancer and breast cancer screening modalities of the respondents of this study were the doctor and the Internet. Less than 50% of the respondents chose nurses or Barangay health care workers/midwife as their sources of information. Other sources included printed materials, TV, friends, relatives, professional organizations, and radio. The findings may imply that doctors are

regarded as the health care professional that can be trusted to provide accurate information on breast cancer and breast cancer screening modalities. On the other hand, the respondents may not yet be aware of the role of other health care providers like the nurse in health education and disease prevention. The explosion of the Internet and social media has reached developing countries like the Philippines. Information from the Internet can easily be accessed anytime as needed for a minimal cost or for free if the participants uses free Internet access from business establishments.

Respondents of the study preferred the Internet or Web-based format as the educational platform for education about breast cancer, breast cancer screening modalities, and breast health in general. Other educational platforms chosen were printed materials, seminar type, face-to-face formal instructions, and radio or TV program. The choice of the Internet or Web-based platform by the respondents may be influenced by the availability, ease of access, and cost-effectiveness of this technology. Use of the Internet will not involve travel cost and time to the educational sites or bookstores. They can access educational sessions as often and anytime as they wish.

Integration of the Findings with Previous Literature for Finding Information

From whom and where women obtain their information may also influence whether they will engage in a particular screening or not. Sunil et al. (2014); Ramathuba et al. (2015); Boxwala, Bridgemohan, and Griffith (2010) had findings that were similar to the dissertation study in that a doctor, physician, a health care provider, and/or general practitioner was the first choice of the participants as their primary source of information about breast cancer and breast screening modalities. In the dissertation study, nurses and midwives/barangay health care worker were ranked 6th and 7th, respectively by the

participants. This finding was similar to the study findings of Parsa et al. (2008), Kayode et al. (2005); however, doctors, nurses and other health personnel were either chosen least or listed last by the respondents as their primary source of information. Other sources listed by the participants were also the sources of information as cited by Sim et al. (2009) about their study participants, including television, posters, family members, and formal teaching; media, television and electronic media, media, television, electronic media, printed media, and medical health personnel (Akhtari-Zavare, Juni, Ismail, Said, & Latiff, 2010 Boxwala et al., 2010; Kayode et al., 2005; Parsa et al., 2008; Ramathuba et al., 2015).

Health education can empower women to take a proactive approach as regard to their health (Ramathuba et al., 2015; Ryhanen et al., 2012). According to Wu and Bancroft (2006) cancer detection education in the Philippines is just evolving. It was only in the 1990s when cancer screening was emphasized in public health in the Philippines. In fact, it was only in June 2015 that a Filipina lawmaker filed a Bill in the Philippine Congress to make October of every year as Breast Cancer Awareness month in order to raise public consciousness about the disease (Asia News Monitor, 2015). The respondents of the dissertation study preferred the Internet as their first choice of educational platform for breast cancer and breast health education. Ryhanen et al. (2012) implemented an Internet-based patient educational program called Breast Cancer Patient Pathway (BCPP) for newly diagnosed Finnish women who were able to use the BCPP program during their treatment process. Bock et al. (2012) used a secured Web-based health questionnaire that enabled breast cancer patients being followed-up in a clinic to

provide and update their health history and symptoms. The results showed that the program increased symptom reporting by patient and facilitated patient-provider communication. Hall et al. (2007) showed an increased in Hispanic women's knowledge about breast cancer with the utilization of the interactive Web site of the Susan G. Komen Foundation. In a qualitative study, Abramson et al. (2015) analyzed the content of the dialogue between an organization and users of the organization's Web page posted in Facebook during the 2010 Breast Cancer Awareness Month. Among the themes that emerged in the study were Facebook as an open space for self-expression and promotion of awareness with scarce health information (Abramson et al., 2015).

In Breast Cancer Bingo, Fact or Myth?, incorporated in the Educational parties was developed to educate underserved and uninsured women about breast cancer awareness (Byrne & Robles-Rodriguez, 2009). Face-to-face education sessions; flyers with information on free cancer screening programs; and in-depth, easy to read packets mailed to participants were used in the Asian Grocery Store-Based Education program intended to increase breast cancer awareness and knowledge of the respondents to motivate them to follow recommended screening guidelines (Sadler et al., 2012). Using trained lay health care workers to recruit respondents and deliver breast health education in the language that the participants can understand resulted in an increase in adherence to breast screening guidelines (Han et al., 2009). A nurse-delivered breast health promotion program was found not to be a strong enough intervention to overcome barriers to having a CBE and mammography among the population of their study (Secginli & Nachivan, 2011).

Research Question 1. What is the relationship between the breast-cancer-related knowledge of Philippine-based Filipino women and their frequency of performing BSE?

Findings showed that there was a positive significant relationship between levels of breast cancer knowledge of the participants with the frequency with which they performed BSE. These results are reflective of the participants' level of knowledge about when to perform BSE. It is also possible that the respondents have been exposed to information about breast cancer and breast cancer screening modalities, especially BSE during high school and even in higher education health education courses. In addition, information about breast cancer and breast cancer screening modalities and the frequency of performing BSE may also have been obtained through the Internet and other sources of information. Further, BSE is cost effective, a familiar method, and can be done in the privacy of the respondents' homes.

The findings of the dissertation study was in accordance with the recommendation of the Philippine Cancer Society (PCS, 2014) that BSE be performed once a month starting from age 25 and 5 to 7 days after menstruation and for post-menopausal women at the end each of month. Filipino-American women who participated in the study conducted by Wu et al. (2006) in Southeastern Michigan were reported to perform BSE according the recommendations by ACS. The findings of the dissertation study are similar to Parsa et al. (2008) who reported that women with higher levels of knowledge of symptoms and screening methods demonstrated high performance rates of BSE. The findings of the present study were dissimilar to Funke et al. (2008) that showed that women with lower degree of education were compliant in examining their breasts once a month compared with women with higher educational degree. The U.S. Preventative

Services Task Force (2016) recommended that it is no longer required of clinicians to teach BSE to women. However, the American College of Obstetricians and Gynecologists (ACOG; Newton, 2016) and WHO (2014) recommend BSE as a means of increasing breast self-awareness among women. Kayode et al. (2005) reported that 90% of breast cases were discovered by women themselves; therefore, BSE is a good tool to learn the topography of one's breasts. In the Philippines, the government continues to campaign for monthly BSE (Ngelangel & Wang, 2002).

Research Question 2. Are the Philippine-based Filipino women's breast-cancer-related knowledge, perceptions (health beliefs) about breast cancer and breast cancer screening modalities, personal modifying factors, and sources of information significant predictors of their intent to perform BSE, submit to screening mammography, and engage in clinical breast examination?

Standard logistic regression analysis results showed that knowledge of breast cancer and barriers to BSE, barriers to mammography, and barriers to clinical CBE were shown in the dissertation study to predict the respondents' intent to perform BSE, submit to screening mammography, and engage in CBE in the next year. The variables of susceptibility, seriousness, benefits to BSE, benefits to mammography, benefits to CBE were found not to have predictive ability.

Integration of the Findings with Previous Literature for Health Belief Model

The health belief model was used as the guiding theoretical framework of the dissertation study to examine which variables would be predictive of the participants' intent on performing BSE, submit to screening mammography, and engage in CBE. Secginli and Nachivan (2005) found out that perceived seriousness, perceived benefits,

and health motivations were not significantly associated with BSE. This result was similar to the dissertation study in which perceived seriousness and perceived benefits to BSE were found not to be predictive of the respondents' intent to perform BSE in the next year. Perceived seriousness was found to be significantly associated with women who used mammography (Secginli & Nachivan, 2005), whereas the result of the dissertation study showed that perceived seriousness does not have predictive ability for the respondents' intent to submit to screening mammography. Wu et al. (2006) stated that a barrier for Filipino women participants in obtaining screening mammography was that they were "afraid that mammography will find cancer" (p. 63). In the dissertation study, barriers to mammography were found to be predictive of their intent to submit for screening mammography. Wu et al. (2006) conducted a study in Southeastern Michigan and found Filipino women and other Asian participants identified being examined by male practitioners and having their breast touched by strangers as barriers to CBE. In the dissertation study, barriers to CBE, such as being examined by a male practitioner and breasts being touched by strangers, were found to be predictive of the respondents' intent to engage in CBE in the next year.

The respondents' modifying variables of age, marital status, educational level, income level, place of residence, family history of breast cancer, and sources of information were found not to be predictive of the respondents' intent to perform BSE, submit to screening mammography, and engage in CBE in the next year. Among these variables, however, a family history of breast cancer, income, and marital status did not reach significance but approached significance, which could imply that they may have predictive ability with large sample size. A family history of breast cancer may become a

predictor to perform BSE and CBE, especially for those respondents who have a family history of breast cancer.

Integration of the Findings with Previous Literature for Education Level

Educational level was found to be a significant predictor of breast cancer in by Gibson et al. (2010). Gibson et al. (2010) found that those who participated in clinical breast examination were more educated than those who did not participate in CBE. Breast cancer screening by CBE is advocated by the Philippine government (Ngelangel & Wang, 2002; Redaniel et al., 2010). In developing Asian countries, CBE alone maybe a cost-effective option (Kim et al., 2014). In India, CBE was found to be as effective as biennial mammography (Okonkwo et al., 2008). In the Philippines, an attempt to study the efficacy of CBE as performed by trained nurses and midwives, involving 151,168 Filipino women, was conducted from 1996 to 1997. The study was short-lived due to multiple issues, and there was no concrete findings reported as to the efficacy of CBE (Smith et al., 2006).

The educational level of Filipino immigrant women in Korea was found to be an important predictor for mammography compliance. Filipino women with higher educational level were found to have mammographies done (Kim et al., 2014). The Philippine Department of Health reported that only 2% of Filipino women had annual screening mammography, despite its availability in the country (Dulanas, 2016). Mammography may still be cost-prohibitive for many Filipino women, and screening mammography is not readily available in the rural areas of the Philippines (Ngelangel, 1994). Ryu et al. (2013) reported that low level of education is associated with low mammography screening rates among Asian-American immigrants that include Filipino

women residing in California. Most women from urban areas of the Philippines perform BSE compared with women living in the rural areas (Philippine Department of Health, 2000). While the focus of the dissertation study was about the predictive ability of the participants' modifying variables for the respondents' intent to perform BSE, submit to screening mammography, and engage in CBE, the findings of the previous studies were in contrast with the dissertation study in which educational level, income level, and place of residence were not found to be predictive of the respondents' intent to submit to mammography and engage in CBE.

Implications of the Findings

The dissertation study is the first to be conducted with the focus on Filipino women living in the Philippines, their level of knowledge, frequency of BSE, their perceptions or health beliefs about breast cancer, breast cancer modalities, modifying variables and the predictive ability of these variables on the respondents' intent on performing BSE, submitting to screening mammography, and engaging in CBE. The implications of this study are discussed in the following sections.

Implications for Nursing Education

The results and findings shed light on the preferred educational platform for breast health. The findings can be used by schools of nursing to design programs to include courses that will develop nursing students' competence for teaching individuals and the community the risk and benefits of BSE, CBE, and screening mammography. Educational programs about breast health may also be developed and administered through multiple avenues like the Internet, printed materials, broadcast media, and face-to-face interactions.

Implications for Nursing Practice

The findings of this study showed that nurses were not regarded as the primary source of information for breast cancer, breast cancer screening modalities, and breast health in general. Local practicing nurses need to explore teaching activities that will promote nurses' teaching role in health education. In addition, registered nurses (RNs) can engage in community activities that will highlight the visibility of RNs as health educators.

Implications for Nursing Research

Results of this study provide baseline for multiple potential follow-up studies. One such study would be to translate the tools used in the dissertation study to the Filipino language in order to include those Filipino women who have very limited ability to comprehend and speak the English language. Other methodologies for collecting data, comparing different educational platforms for effectiveness in delivering breast health education, and determining efficacy of virtual simulation as strategy for training nursing students on CBE are examples of some trajectories for further research. It is also recommended that future studies about the intent to perform BSE, submit to mammography, and engage in CBE include fear and cultural factors that were not included in the dissertation study.

Implications for Public Policy

Findings of the dissertation study could be used by The Philippine Nurses Association and local nursing associations in spearheading advocacy activities in support of legislation promoting breast health among Filipino women that could include implementing breast screening guidelines. In addition, the local Philippine Department of

Health can initiate publication of trustworthy Internet Web sites for breast health that is free to the public.

Limitations

The strength of the dissertation study is derived from the usage of reliable survey tools that include McCance Breast Cancer Knowledge Test, Champion's Revised Susceptibility, Seriousness of Breast and Barriers to Breast Cancer Screening Modalities scale, and Sunil et al.'s CBE questionnaire scale. It was also the belief of the investigator that using the messaging feature of the popular social media platform was an innovative and cost-effective way of collecting data that will increase the turnaround time for the return of respondents' survey results.

There are several limitations that were identified in this study. The process of recruitment and data collection were carried out through the messaging feature of a popular social media platform. Around 600 potential respondents were contacted, 316 consented to participate, and 188 participants completed the entire survey. One of the issues reported was Internet connectivity and reliability, especially in the rural areas of the Philippines. This problem was compounded when the country was hit by a typhoon in 2017 when collection of data had just begun. The natural disaster included power outages and unreliable Internet connections. Although the messaging feature of the social media used is free and all of the respondents own or have access to computers, lap tops, and smart phones, all of them were using data that was associated with certain cost. Answering the questionnaire meant a fraction of their "data" were used. No study incentive was offered to those who participated in the study. Responses to the survey questionnaires were self-reported; therefore, the responses may have been influenced by

the respondents' overall well-being at the time of data collection. Although power analysis called for 300 respondents, 316 participated but with missing data that were scattered randomly across categories and outcomes. Only 188 respondents completed the survey in its entirety. Significant results and findings from the dissertation study cannot be generalized to different populations and should be used cautiously.

Chapter Summary

This dissertation study was carried out to determine the Philippine-based Filipino women level of knowledge about breast cancer and breast cancer screening modalities, their perceptions/health beliefs, predictive ability of their health perceptions and the modifying variables on their intent to perform BSE, submit to screening mammography, and engage in CBE. Pearson correlation coefficient, standard direct logistic regression, and binary logistic regression were the statistic tests used to answer the research questions. Findings indicated that the Philippine-based Filipino women levels of knowledge was correlated with the frequency with which they performed BSE. In addition to knowledge, the respondents' perceptions/beliefs about the barriers to BSE and CBE were found to be predictive of their intent to perform BSE, submit to screening mammography, and engage in CBE. The respondents' health beliefs/perceptions about perceived seriousness, severity, benefits to BSE, CBE, and benefits and barriers to mammography were not predictive of the respondents' intent. The respondents' modifying variables were found not to have predictive ability. However, respondents' income level, family history of breast cancer, and marital status approached the level of significance and may be predictive of the respondents' intent to perform BSE, submit to screening mammography, and engage in CBE with large sample size. The HBM was

supported by the results of the study. Implications of the results of this study may influence creation of and implementation of nursing courses, further studies on the topic, community outreach and advocacy activities, and policy changes in the Philippines to improve Philippine-based Filipino women's breast health.

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Appendix A

IRB Approval

NOVA SOUTHEASTERN UNIVERSITY
Institutional Review Board
3301 College Avenue • Fort Lauderdale, Florida 33314-7796
(954) 262-0000 • 800-672-7223, ext. 5369 • Email: *irb@nova.edu* • Web site: www.nova.edu/irb

MEMORANDUM

To: **Elizabeth Azutillo**

From: **Vanessa Johnson,**
Center Representative, Institutional Review Board

Date: **July 5, 2017**

Re: **IRB #: 2017-425; Title, "Philippine-Based Filipino Women and Breast Cancer"**

I have reviewed the above-referenced research protocol at the center level. Based on the information
provided, I have determined that this study is exempt from further IRB review under **45 CFR 46.101(b) (**
Exempt Category 2). You may proceed with your study as described to the IRB. As principal investigator, you must adhere to the following requirements:

1) CONSENT: If recruitment procedures include consent forms, they must be obtained in such a manner that they are clearly understood by the subjects and the process affords subjects the opportunity to ask questions, obtain detailed answers from those directly involved in the research, and have sufficient time to consider their participation after they have been provided this information. The subjects must be given a copy of the signed consent document, and a copy must be placed in a secure file separate from de-identified participant information. Record of informed consent must be retained for a minimum of three years from the conclusion of the study.

2) ADVERSE EVENTS/UNANTICIPATED PROBLEMS: The principal investigator is required to notify the IRB chair and me (954-262-5369 and Vanessa Johnson, respectively) of any adverse reactions or unanticipated events that may develop as a result of this study. Reactions or events may include, but are not limited to, injury, depression as a result of participation in the study, life threatening situation, death, or loss of confidentiality/anonymity of subject. Approval may be withdrawn if the problem is serious.

3) AMENDMENTS: Any changes in the study (e.g., procedures, number or types of subjects, consent forms, investigators, etc.) must be approved by the IRB prior to implementation. Please be advised that changes in a study may require further review depending on the nature of the change. Please contact me with any questions regarding amendments or changes to your study.

The NSU IRB is in compliance with the requirements for the protection of human subjects prescribed in
Part 46 of Title 45 of the Code of Federal Regulations (45 CFR 46) revised June 18, 1991.

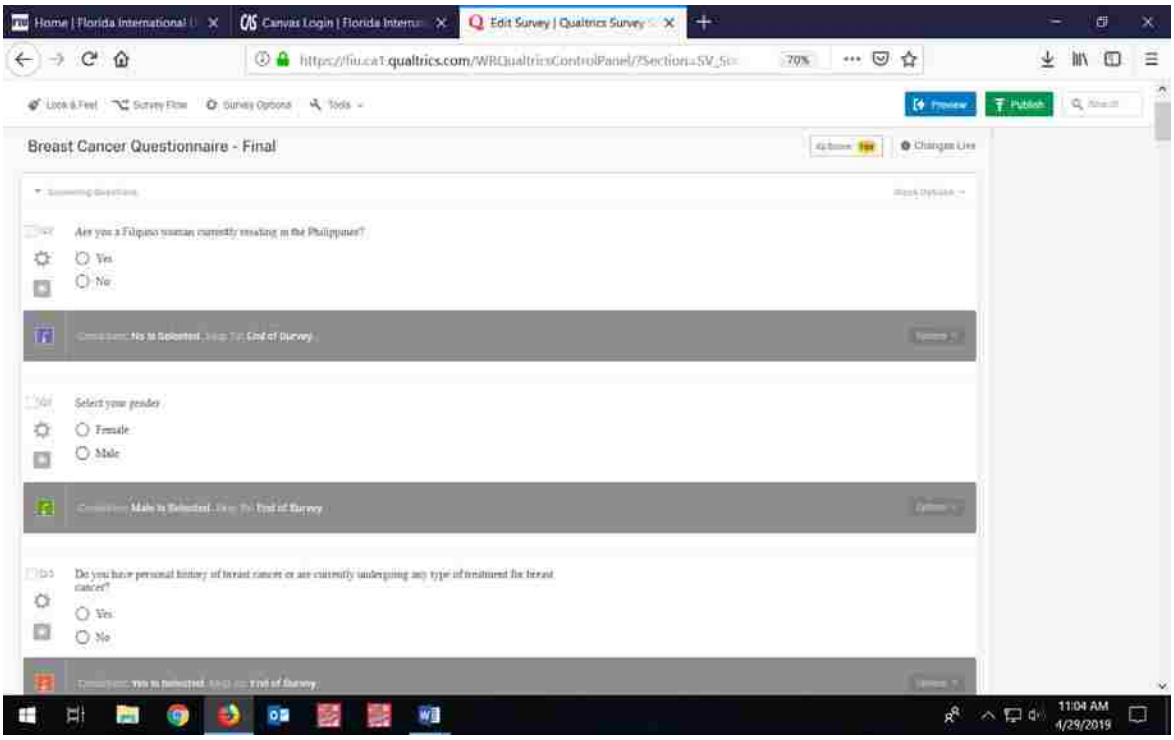
Cc: Cynthia Fletcher

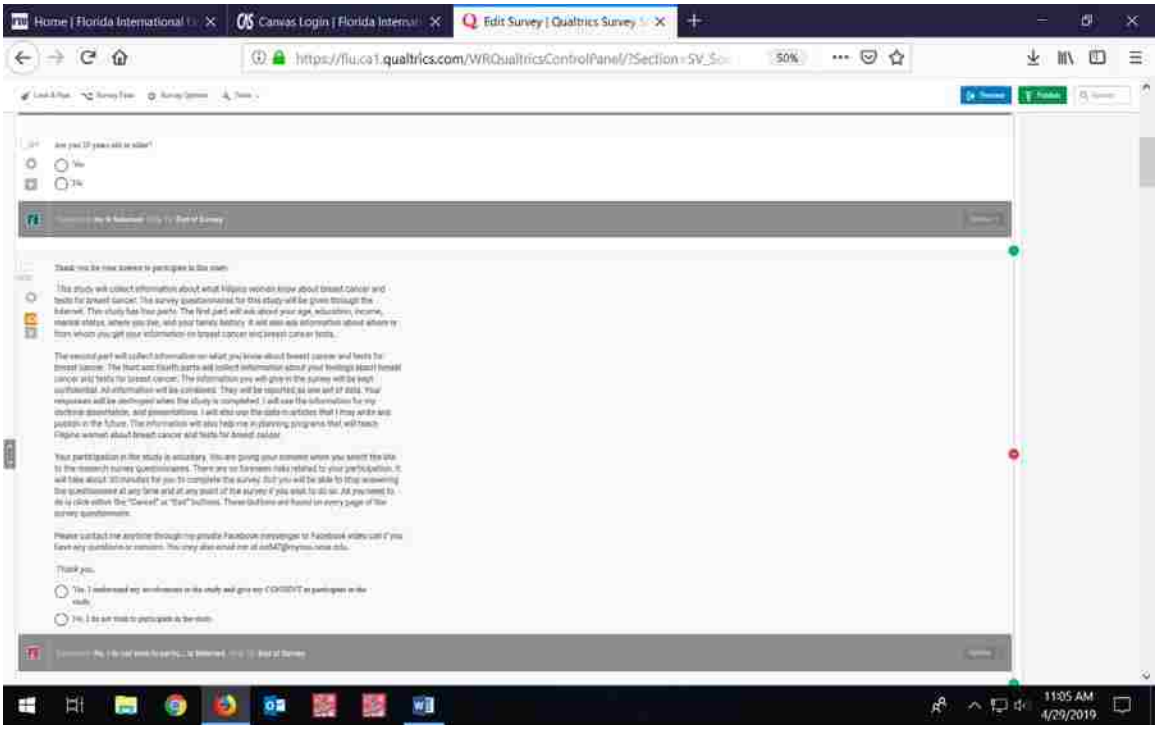
Vanessa Johnson

Appendix B

Detailed Description of the Study

(Screenshot from Qualtrics)




Home | Florida International
Canvas Login | Florida Internat
Edit Survey | Qualtrics Survey
https://fiu.ca1.qualtrics.com/WRQualtricsControlPanel/?Section=SV_5
50%
Are you 18 years old or older?
Yes
No
Thank you for your interest to participate in this study.
This study will collect information about what Filipino women know about breast cancer and tests for breast cancer. The survey questionnaires for this study will be given through the Internet. This study has four parts. The first part will ask about your age, education, income, marital status, where you live, and your family history. It will also ask information about where to from whom you get your information on breast cancer and breast cancer tests.
The second part will collect information on what you know about breast cancer and tests for breast cancer. The third and fourth parts will collect information about your feelings about breast cancer and tests for breast cancer. The information you will give in the survey will be kept confidential. All information will be combined. They will be reported as one set of data. Your responses will be destroyed when the study is completed. I will use the information for my doctoral dissertation, and presentations. I will also use the data in articles that I may write and publish in the future. The information will also help me in planning programs that will teach Filipina women about breast cancer and tests for breast cancer.
Your participation in the study is voluntary. You are giving your consent when you search the link to the research survey questionnaires. There are no foreseen risks related to your participation. It will take about 10 minutes for you to complete the survey. But you will be able to stop answering the questionnaire at any time and at any point of the survey if you wish to do so. All you need to do is click either the "Cancel" or "Exit" buttons. These buttons are found on every page of the survey questionnaire.
Please contact me anytime through my private Facebook messenger or Facebook video call if you have any questions or concern. You may also email me at xxM2@mymail.nova.edu.
Thank you.
Yes, I understand my involvement in the study and give my CONSENT to participate in the study.
No, I do not want to participate in the study.
11:05 AM
4/29/2019

Appendix C

Respondent Letter

NOVA SOUTHEASTERN UNIVERSITY
Health Professions Division
College of Nursing-Palm Beach
Florida, USA

Date: July 12, 2017

Dear Respondent,

My name is Elizabeth Azutillo. I am a graduate student in the College of Nursing, at Nova Southeastern University in Florida, USA. I would like to learn what Filipino women know about breast cancer and tests for breast cancer. The study will be done in the Philippines. The information I will learn from this study will help me plan programs to teach Filipino women about breast cancer and tests for breast cancer. You will be asked to complete a survey on the internet if you agree to participate.

If you are interested in taking part in this study, please respond to this post. I will send you an internet link that will explain the study and give you access to the questionnaire. The survey questionnaires will be sent to you through the Internet.

Please feel free to send me a message through my personal and private Facebook messenger anytime. Or you may call me through my FB video if you have any questions or concern. You may also send me an email at ea547@mynsu.nova.edu.

Thank you.

Very truly yours,

Elizabeth Azutillo

Elizabeth S. Azutillo, M.A., M.S.N., R.N.

PhD in Nursing Education Candidate

Appendix D

Screening Questions

1. Are you a Filipino woman currently residing in the Philippines?

   YES NO

2. Select your gender.

   FEMALE MALE

3. Do you have personal history of breast cancer or undergoing any type of treatment for breast cancer?

   YES NO

4. Are you 20 years old or older?

   YES NO

5. Are you familiar with FB messenger or FB video call?

   YES NO

Appendix E

Modifying Variables

Modifying Variables/ Demographics, BSE Frequency, Personal Intent, Sources of Information, and Preferred Education Platform Questionnaire

1. What is your age (in years)? _____
2. Which best describes your marital status?
   Single
   Married
   Separated
   Widow
   In a Relationship
3. Which best describes your educational level?
   Some Elementary
   Elementary graduate
   Some High School
   High School Graduate
   Some College
   College Graduate
   Some Graduate Studies
   Masters/Doctorate Graduate
4. Which best describes your family's annual income? (As of Oct 2017-PSA)
   Below Php 9,064.00
   Php 6,000-10,000
   Above 10,000
5. Is your primary place of residence best describe as:
   Urban (large city)
   Small city
   Town/Municipality
6. Do you have family history of breast cancer?
   YES
   NO
   Others (please specify)_____
7. How frequently do you examine your breast?
   a. once a month
   b. every 6 months
   c. once a week
   d. don't know
8. In the next year, will you:
   Perform Breast Self-examination---------- YES NO
   Engage/Submit for Clinical Breast Examination------ YES NO
   Submit for mammography screening---------- YES NO

9. Which of the following sources of information do you use to obtain information about breast cancer and breast self-examination, clinical breast examination, and mammography screening? Please indicate all that apply to you.
   Doctor
   Nurse
   Barangay Health Care worker/Midwife
   Friends
   Relatives
   Internet
   TV
   Radio
   Magazines/Newspapers
   Books/brochures
   Professional Organizations
10. The data that will be obtained from this study will be used in future development of an educational breast health program. Please indicate all your preference of an educational platform.
    a. Internet or Web-based
    b. Face-to-face formal instruction
    c. Printed materials such as flyers, brochures, hand-outs
    d. Seminar-type of instruction
    e. Radio or Television program
    f. Others (please specify)

Appendix F

McCance Breast Cancer Knowledge Test

1. If you are post-menopausal, how often should you do breast examination?
   a. Each week
   b. Once a month
   c. Every three months
2. Most breast lumps are found by
   a. Women themselves
   b. Physician
   c. Mammogram
3. How much difference does regular breast cancer screening make in the chance of curing breast cancer?
   a. a great deal
   b. some difference
   c. little or no difference
4. A woman who regularly feels her breasts is doing one of the most effective methods of breast cancer detection.
   a. True
   b. False
   c. Don't know
5. Mammography can detect lumps that can't be felt.
   a. True
   b. False
   c. Don't know
6. At what age should a woman begin self-examination?
   a. 20
   b. 30
   c. 35
   d. Don't know
7. If a woman gets regular mammography, she does not need to do breast self-examination or have a clinical breast examination (examination of breasts by doctors or nurses).
   a. True
   b. False
   c. Don't know
8. Mammography is recommended every two years for women 50 years and over.
   a. True
   b. False
   c. Don't know
9. Using the palm of your hand is the most effective method of detecting a breast lump.
   a. True
   b. False
   c. Don't know
10. Breast self-examination should be performed during your period when lumps are most easily detected.
    a. True

b. False
c. Don't know

11. An important part of breast self-examination is looking at your breasts in the mirror.
    a. True
    b. False
    c. Don't know
12. It is not necessary to look at your breast during breast self-examination.
    a. True
    b. False
    c. Don't know
13. Some nipple discharge is expected as you get older when you squeeze the nipple during breast self-examination?
    a. True
    b. False
    c. Don't know
14. Breast self-examination should include feeling for lumps under your arm.
    a. True
    b. False
    c. Don't know
15. Squeezing the nipple is necessary for a good examination.
    a. True
    b. False
    c. Don't know
16. How often should a breast self-examination be performed?
    a. Every 6 months
    b. Once a month
    c. Once a week
17. When feeling (palpating) the breast, you should use
    a. The finger pads of your fingers
    b. Use the tips of your fingers
    c. Don't know
18. Abnormal breast changes includes the following:
    a. Discharge
    b. Lump, hard knot, or thickening
    c. Dimpling of the skin
    d. All of the above
    e. None of the above
    f. Don't know
19. The risk of getting breast cancer increases with age
    a. True
    b. False
    c. Don't know

Appendix G

RSBBSM and Sunil et al.'s CBE Questionnaire

Champion Revised Susceptibility, Barriers and Benefits Scale for Mammography

And Sunil et al.'s CBE Questionnaire

Item	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
1. It is extremely likely I will get breast cancer in the future					
2. I feel I will get breast cancer in the future					
3. There is a good possibility I will get breast cancer in the next 10 years					
4. My chances of getting breast cancer are great					
5. I am more likely than the average woman to get breast cancer					
6. The thought of breast cancer scares me					
7. When I think about breast cancer, my heart beat faster					
8. Problems I would experience with breast cancer would last a long time					
9. Breast cancer would threaten a relationship with my partner					
10. If I had breast cancer, my whole life would change					
11. If I developed breast cancer, I would not live longer than five years					
12. When I do Breast Self-examination, I feel good about myself					
13. When I complete monthly breast self-examination, I don't worry as much about breast cancer					
14. Completing breast self - examination each month will allow me to find lumps easily					
15. If I complete breast self-examination monthly during the next year, I will decrease my chance of dying from breast cancer					

16. If I complete monthly breast self-examination I will decrease my chances of requiring radical or disfiguring surgery if breast cancer occurs					
17. If I complete monthly BSE, it will help me find a lump that might be cancer before it is detected by a doctor or a nurse.					
18. I feel funny doing Breast Self-Examination					
19. Doing breast self-examination during the next year will make me worry about breast cancer					
20. Breast self- examination will be embarrassing to me					
21. Doing breast self-examination will be unpleasant					
22. Doing breast self-examination will take too much time					
23. I don't have enough privacy to do breast self-examination					
24. If I get a mammogram and nothing is found, I will not worry as much as about breast cancer					
25. Having a mammogram will help me find breast lumps early					
26. If I find a lump through a mammogram, my treatment for breast cancer may not be as bad					
27. Having a mammogram is the best way for me to find very small lump					
28. Having a mammogram will decrease my chances of dying from breast cancer					
29. I am afraid to have a mammogram because I might find out something is wrong					
30. I am afraid to have a mammogram because I don't understand what will be done					
31. I don't know how to go about getting a mammogram					
32. Having a mammogram would be too embarrassing					
33. Having a mammogram would take too much time					

34. Having a mammogram would be too painful					
35. People doing a mammogram are rude to women					
36. Having a mammogram would expose me to unnecessary radiation					
37. I would not remember to schedule a mammogram					
38. I have other problems more important than getting a mammogram					
39. Having a mammogram would cost too much money					
40. If I have clinical breast examination from a doctor or a nurse, I don't need mammogram					

Sunil et al.'s Clinical Breast Examination: Benefits and Barriers Questionnaire

1. The embarrassment caused by having a clinical breast exam would make me have second thoughts about having one					
2. I have so many other problems that I cannot be bothered with having a clinical breast examination					
3. The cost of clinical breast examination would cause me to hesitate about getting one					
4. It is very hard for me to get to a place where they do clinical breast examination					
5. There is so much different information about how often women should have a clinical breast examination that I am confused					
6. The pain caused by having a clinical breast examination is bad enough to make me put off getting one					
7. I am afraid to have a clinical breast examination because I might find out something is wrong					
8. I am afraid to have a clinical breast examination because I don't understand what will be done					

9. I don't know how to go about getting a clinical breast examination					
10. Having a clinical breast examination is too embarrassing					
11. Having a clinical breast examination takes too much time					
12. Having a clinical breast examination is painful					
13. People who do clinical breast examinations are rude to women					
14. I cannot remember to make an appointment for a clinical breast examination					

Appendix H

Letters of Permission

RE: Request for permission to use BKCT

Thu 4/27/2017 2:37 PM

To:Elizabeth Azutillo <ea547@nova.edu>;

I give you permission to use the Breast Cancer Knowledge Tool in your dissertation.

April 26, 2017

Elizabeth Antillo
Nova Southeastern University
Fort Lauderdale, FL

Dear Ms. Antillo,

Thank you for your interest in my work. You have permission to view and modify the Revised Susceptibility, Benefits, and Barriers Scale from the Champion Health Belief Model for your use as long as you cite my work and send me an abstract of your completed project.

Re: USE of survey questionnaire

Tue 4/25/2017 8:10 PM

Hi Elizabeth,
Thank you for contacting me about questionnaire. I gave you the permission to use a section of my questionnaire for your research. Please include appropriate citation in your work as needed. Good luck on your study.

From:
Date: Monday, April 24, 2017 at 11:56 AM
To:
Subject: USE of survey questionnaire

Greetings!
Hope this email finds you well. I am a student in the PhD in Nursing program at Nova Southeastern University in Fort Lauderdale, Florida. I am now in my PhD candidacy and plan to do my dissertation research on Philippine-based Filipino women and Breast Cancer. I am writing to you to request permission to use a section of your study questionnaire, specifically the perceived barriers to CBE which I will add to my other survey questionnaires.

Anticipating with heartfelt gratitude positive response to this request.
Thank you.
Elizabeth Azutillo

Appendix I

BCKT Summary

Question	Number Correct	Number Incorrect	Percent Correct
Q1	90	129	41.1%
Q2	156	63	71.2%
Q3	183	36	83.6%
Q4	172	47	78.5%
Q5	176	43	80.4%
Q6	138	81	63.0%
Q7	139	80	63.5%
Q8	56	163	25.6%
Q9	86	133	39.3%
Q10	101	118	46.1%
Q11	123	94	56.7%
Q12	110	107	50.7%
Q13	109	108	50.2%
Q14	166	51	76.5%
Q15	99	118	45.6%
Q16	124	93	57.1%
Q17	110	107	50.7%
Q18	148	69	68.2%
Q19	167	50	77.0%