RISK FACTORS OF BREAST CANCER AMONG WOMEN: A META ANALYSES

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ABSTRACT

This paper examined the risk factors of breast cancer among women using meta-analyses. A review of past studies was made to determine the characteristics of researches on risk factors of breast cancer among women where most victims came from the Philippines. Of the 21 articles examined, only five were selected. Four of the studies were from the Philippines and another one was included because it investigated the most number of similar variables of the intended study. Of the five studies, 4 made use of case-control design and 1 was cross-sectional. The sample sizes vary from 480 to 10953 women. The studies identified 10 risks factors and 7 of these were investigated in at least two researches.

INTRODUCTION

"Today we fight. Tomorrow we fight. The day after, we fight. And if this disease plans on whipping us, it better bring a lunch, 'cause it's gonna have a long day doing it." – *Jim Beaver, Life's That Way: A Memoir*

Cancer is a life – threatening disease because of its rapid cell division. The impact of cancer is a burden for the patient and for the society as a whole, which is why the cost of anti-cancer drugs have been increasing and researches and discovery of affordable but similarly efficient alternative treatment would be a breakthrough. From a DOH official, heart attack, stroke, and cancer remain the top causes of death among Filipinos and based on the DOH data in 2009/ Philippines Cancer Society, 2010/ World Health Organization, nine people are diagnosed with cancer every hour.

From Cebu Daily News, in an article of Dr. Philip S. Chua "How to Reduce Cancer Risk", the big "C" is arguably the most dreaded of all diseases, with its general reputation as a fast killer. While other serious illnesses are also horrible, including Alzheimer's dementia, the devastating nature of almost all forms of cancer understandably instills extreme fear in all of us. The estimated new cases of all varieties of cancer for 2014 among all ages are: For all sites – 855,220 (men) and 810,320 (women), a total of 1,665,540 for both. Specific sites: colon and rectum, 71,830 (men), 65,000 (women); lungs and bronchus, 116,000 (men), 108,210 (women); breast, 232,670, and prostate, 233,000. Expected deaths among those cases above: For all sites, 310,010 (men) and 275,710 (women), a total of 585,720. For colon and rectum, 26,270 (men), 24,040 (women); lungs and bronchus, 86,930 (men), 72,330 (women); breast 40,000; and prostate, 29,480.

Cancer is a dreadful disease that can be developed at any age. According to Freeman (2015), 75% of the cancer patients in the Philippines are 50 years old and above while 3.2% are in their pediatric age, that is, between 0 and 14 years. Moreover, the World Health Organization estimated that the number of deaths worldwide that are caused by cancer would increase from 7.6 million to 17 million deaths in 2030. In the Philippines, cancer ranked third in the list of leading causes of death in the country in 2010, with the following as the ten top causes of cancer

deaths in the country for that same year: (1) Breast Cancer; (2) Lung Cancer; (3) Liver Cancer; (4) Cervical Cancer, and (5) Colon Cancer.

Breast cancer is most common among women than most men. It is the leading killer of women aged between 35 and 54. Over a million developed the disease without knowing it, and almost 500,000 women die from it every year (www.pinayinaction.com). Higher incidence rates were observed from technologically advanced societies such as North America, Europe, and Australia, while lower rates were observed in Africa and Asia. However, according to Narod et al (2006), there is a discrepancy in the incidence rates of breast cancer among women in Asian countries. The Philippines has the highest prevalence of breast cancer in Asia, and the 9th highest in the world today. Even with the successful fertility reduction and change of lifestyles of Filipino women, the inadequate or lack of knowledge of breast health contributed to the its recorded highest prevalence in Asia. This is due to limited income, high costs of diagnostic tests and hospital care, low level of education, and lack of breast cancer awareness.

Approximately 70% of breast cancers occur in women with undetermined risk factors and about five percent of breast cancers are hereditary. In the past, the risk of breast cancer was 1in 22. Today, it is already 1 in 8 cases. The figures are alarming, this why the government and private institutions have vowed to help fight off the disease.
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As private individuals, the researchers would like to investigate the risks factors of breast cancers for a number of their friends have been victims and became statistics of such disease. This motivates the researchers to conduct a meta-analysis on the risk factors of breast cancer among women.

Related Literature and Studies

Many of us have witnessed the sufferings of those people afflicted with breast cancer – may they be a family member, a relative or a friend. Most of the questions asked after knowing that they have the disease- "why me?". Although some of them have accepted it, yet breast cancer have been considered as a menace to everyone.

Cancer of the breast among women has been a major health problem not only in the Philippines but also in other countries. It is a dreadfully nasty disease that destroys women at the prime of their lives. A cancer is developed when cells undergo an abnormal change and begin to grow and spread within the body. These abnormal cells then grow into tumors that can be benign or malignant. Anyone can be afflicted with cancers at any age but breast cancer is very common women than men. What is distinct among women that they are vulnerable to such disease? Does this brought about by their physiological structure? Or is it the genes that are inherited from their parents or is it some environmental factors? There are still a lot of things we do not know about breast cancer. Understanding these will help us fight and find cure so that many will be able to survive the disease.

A number of investigations worldwide have been conducted to identify and understand the factors that attributed to the occurrences of breast among women. In the Philippines, for example, initiatives have been taken by different health organizations to fight off the disease. The Philippine government has also taken the first step by contracting hospitals nationwide with proven expertise in the treatment of the disease through the P100,000-benefit payment for the early stage breast cancer.

In a study conducted by Chemicals Health Monitor (2008), it underscored the high incidence

of breast cancer in developed European countries, and the sharp increase of new cases in the rapidly developing eastern European countries, have caught their attention. It was mentioned in the study that the rate of increase is so fast that they suspected that it is not mainly attributed to hereditary factors. Some incidences may have been brought about by the environment or today's lifestyles. Physicians believed that some factors that can influence a woman's chances of getting breast are age, weight, number of children she has and the possession of the breast cancer genes. These are known as "established risk factors".

Another risk factor for breast cancer is the environment or the place where we lived. There were studies conducted identifying environmental factors as potential cause of breast cancer (Brody & Rudel, 2003; Kim, etal, 2005; Coyle, 2014). According to studies conducted by Donovon et al (2007), one of the environmental factors that may be important in breast cancer is exposure to certain man-made chemicals. Evidences are emerging to support the theory that exposure to pollutants in our environment, food and water, and to chemicals in consumer products in our homes, offices and schools may be a risk factors of breast cancer.

In another study conducted Coyle (2014), she found out that environmental factors explained a large proportion of breast cancer incidence. She added that known risk factors for breast cancer, which are related to the reproductive life of women, and other factors, such as inheritance and socioeconomic status, explained only about half of the breast cancer cases in the US. Ionizing radiation is an established environmental risk factor of breast cancer. Chemicals that induced mammary cancer in rodents have served as leads for studies in humans, but occupational and environmental exposure to these chemicals have for most part lacked association with breast cancer risks. Coyle (2014) have also mentioned in her study that over the years, cigarette smoking as a risk factor for breast cancer has remained controversial. However, recent research has found passive smoke exposure to be associated with increased breast cancer risk, which is hypothesized to be accounted for on the basis of an anti-estrogenic effect of smoking. She also noted that solar radiation to be associated with reduced breast cancer, supporting the hypothesis that vitamin D plays a protective role in reducing the risk of breast cancer.

There are different risk factors of breast cancer published in the journals worldwide. Different countries have differing risks but there are those with similar risk factors. Established risked factors which are outlined by CHEM Trust (2007) were genetic predisposition and family history, natural oestrogen, oestrogen in pharmaceutical products present in pills and HRT (hormone replacement therapy), weight gain and lack of exercise, alcohol consumption, etc.

According to Lapeña (2012), among Filipino women in particular, breast cancer accounts for 30 per cent of all cancer cases. Fifteen Filipinos die every day due to breast cancer based on the 2005 to 2010 data provided by the Philippine Cancer Society. Smoking, excessive drinking, unhealthy diet, and lack of exercise are among the major factors that cause non-communicable diseases such as breast cancer. 26 females out of 100 females and 1 male for every 105 males may be diagnosed with breast cancer in the Philippines. Since 1980s, breast cancer ranks 1st among the top leading cancers afflicting women in the Philippines. Its incidence starts to peak at the age of 30 in women (Philippine Cancer Facts & Estimates, PCSI, 2005). Generally, the disease is still being diagnosed late in its course hence survival rate of breast cancer in the Philippines is below 50%. Making the situation more difficult, an estimated 70% of breast cancer in the Philippines are indigents.

In a study by the US-based Fred Hutchinson Cancer Research Center (as cited in www.pinoyinaction.com, February 12, 2010), they found out that women who work the graveyard shift may face up to 60% higher risk of breast cancer compared to those who never work at night. The Institute for Occupation Health and Safety Development have added that women who work at

night, like those employed in call centers, could be prone to breast cancer and menstrual problems. Their studies showed that exposure to light at night may affect the production of melatonin, a hormone which is mainly produced by the pineal glands during the night. Nighttime sleep deprivation or exposure to light at night somehow interrupts melatonin production, which in turn stimulates the ovaries to kick out extra estrogen, a known hormonal promoter of breast cancer.

In a breast cancer study conducted among Filipino women in Manila, by Bautista et al (2010), age-adjusted incidence rates of breast cancer vary greatly worldwide with highest rates were observed in westernized countries of North America and Europe. Smaller incidence rates were observed in Asian and African populations with exception of breast cancer incidence in Manila as reported by the Manila Cancer Registry in the Philippines. According to Bautista et al (2010), the reason for the higher rate is unknown but may be associated with the change in lifestyle that has occurred in urban Manila since 1960s. A study was concluded in 1995 using a randomized controlled trial which was set up in Manila to evaluate the feasibility of a screening intervention by clinical breast examination as an alternative to mammography. The cohort of 151,168 women was followed up to 2001 for cancer incidence and a nested case-control study was carried out. The investigation was to evaluate whether increase in breast cancer risk is associated with known risk factors. Increased risks were shown for a higher level of education, nulliparity, and late age at birth. The study had also found out that no association between increase breast cancer risks and excess body weight, height, use of exogenous or alcohol consumptions.

Because of the conflicting results of studies described above, a more thorough investigation has to be conducted in order to fully understand the phenomenon – breast cancer risks. Differing results may have been contributed to regional differences, but still other studies gave similar findings. Although, some research findings have identified environmental factors but a combination with genetic predisposition, age exposure, and other factors have cumulative effect on breast cancer risk. Finally, the researchers believed that concluding breast cancer incidence rates are higher in "westernized" countries is an overgeneralization.

Conceptual Framework

As defined by Wikepedia: A Meta analysis is "a statistical analysis that combines the results of multiple scientific studies." The method is to employ the use of statistics to be able to obtain a "pooled estimate closest to the unknown common truth based on how this error is perceived". Meta-analysis uses a statistical approach to combine the results from multiple studies in an effort to increase power (over individual studies), improve estimates of the size of the effect and/or to resolve uncertainty when reports disagree. A meta-analysis is a statistical overview of the results from one or more systematic reviews.

This investigation will employ meta-analysis to be able to identify the risk factors of breast cancer among women. Breast cancers and risks factors were the key words to search for data that can be used in the analysis. A risk factor is anything that affects our chances of getting a disease, such as cancer. Different cancers have different risk factors. For example, exposing skin to strong sunlight is a risk factor for skin cancer. Smoking is a risk factor for cancers of the lung, mouth, bladder, kidney, and several other organs. But risk factors don't tell us everything. Having a risk factor, or even several, does not mean that you will get the disease. Most women who have one or more breast cancer risk factors never develop the disease, while many women with breast cancer have no apparent risk factors (other than being a woman and growing older). Even when a woman with risk factors develops breast cancer, it is hard to know just how much these factors might have contributed(Bermejo & Brandt, 2009; Cauley et al, 2006).

In a study conducted by Coyle (2004), she mentioned that female gender, age, and country of birth are the strongest determinants of breast cancer risk. The risk factors for breast cancer are also related to the reproductive cycle such as early age at menarche, late age at first full-term pregnancy among other. Moreover, she also included inheritance factor, radiation, alcohol consumption and higher educational level and socioeconomic status as risks to incidence of breast cancer.

STATEMENT OF THE PROBLEM

The study investigated the risk factor of breast cancer among women using meta-analysis. Specifically, the study sought to determine the following:
1. Profile of the breast cancer victims based on the following:
    1.1. Family History
    1.2. Education
    1.3. Age First Menstruation/Menarche & At First Birth
    1.4. Body Mass Index
    1.5. Parity/ Number of Children
    1.6. Smoking and Drinking Habits
    1.7. Use of Coconut Milk

2. Identify risk factors of breast cancer based on studies identified

Definition of Terms.

For the purposes of this paper, the following terms are operationally defined:

Risk factors refer to the factors that have associations with breast cancer

Meta-analysis refers to a quantitative, formal, epidemiological study design used to systematically assess the results of previous research to derive conclusions about that body of research.

Menarche refers to first menstrual period of an individual

Parity refers to the state or fact of having borne offspring. Also refers to the number of children previously borne

SIGNIFICANCE OF THE STUDY

According to an article in one of the local newspaper in Cebu City, breast cancer became the most common cancer, in fact, the number one, in the country with 16 percent of a total of 50,000 cases resulting in death as of the year 2010. The disease had also become the leading cause of cancer for Filipino women. Most doctors advised women to have a regular self-breast examination to detect abnormal growth in the breasts so that the cancer can be treated during its early stages. To solve this growing problem among women, the Philippine Cancer Society had provided more free mammography services, fine needle aspiration biopsy, and education campaigns to help more Filipinas in combating the disease (The Freeman, 2015).

With the rapid growth and alarming growth of epidemic of breast cancer among women, there is a need to revisit and strengthen the Philippine Cancer Control Program of the country. With the information collected from this study, it will be disseminated in the local and national fora through the assistance of the organizations that are directly attached to breast cancer program of the country

such as: Philippine College of Surgeons, Philippine Society of Medical Oncology, Philippine Breast Cancer Society, Philippine Society of Pathologists, the Ramon Aboitiz Foundation, Inc. , Department of Health, etc.

This study will also serve as a springboard to future study about survival analyses of breast cancer among women in the Philippines.

Scope and Limitation

This study is limited only to the studies of breast cancer cases among women from 2000–2016. The data that will be considered are all those breast cancer patients from 2000 to 2016. Variables of interest for this investigation are all present (if not, should be common) to most (if not all) researches. Otherwise, some of these will be deleted.

METHODOLOGY

This paper made use of meta-analysis to collect and analyze available data about breast cancer occurrences form 2000 to 2016. The objective of this study was to derive a pooled estimate closest to the unknown common truth based on how this error is perceived. Meta-analysis uses a statistical approach to combine the results from multiple studies in an effort to increase power (over individual studies), improve estimates of the size of the effect and/or to resolve uncertainty when reports disagree. A meta-analysis is a statistical overview of the results from one or more systematic reviews.

The reviewed researches on breast cancer were segregated in accordance with the objective of the study. All possible studies will be pooled based on similarities and differences to maximize the number of characteristics that are present. Associations of the variables of interest and the incidence of breast cancer among women will be measured using Odds Ratio. The following topics and respective variables were reviewed:

- Identification of studies: authors, year, and publication
- Study characteristics: design and data collection method
- Sample characteristics: size, mean age and/ or age bracket, and selection methods. In the studies on associations, these characteristics were reviewed only in the comparison groups
- Distribution of the risk factors are investigated, all the factors whose frequencies are specified in the study results. For those in which only absolute frequency was presented, the proportions of factors were calculated.

RESULTS AND DISCUSSIONS

The investigation had a literature search of 20 studies. After reading the studies, only 9 were conducted in the Philippines. Of these 9 researches, only four were researches on the risk factors of breast cancer. Another breast cancer risk factors study conducted by Hampton et al 2007 was included in this investigation to give a better understanding of the disease and its risk factors. Thus, the investigators decided to include the five studies as a representative sample to be able to give a realistic picture of the risk factors of breast cancer in the Philippines and compare that of Hampton et al (2007) investigation. .

<u>Study Characteristics</u>

Table 1 showed the principal characteristics of the studies reviewed. These studies were published in international journals: two (2) from International Journal of Cancer and one (1) each

from Cancer Causes and Control, Breast Cancer Research and Treatment, and Asian Pacific Journal of Cancer Prevention. These were all considered as reputable journals for studies about cancer. As previously mentioned, the four studies were conducted in the Philippines and one study was conducted at Wisconsin, USA.

Of the 5 studies, only one was cross sectional and the other four were using the case-control designs. A variety of data collection methods were also employed such as interviews, questionnaires, and clinical examinations conducted in the hospitals or health centers within the barangay. Selection of breast cancer cases were also made using random sampling, recruitment, or a census was considered. Note that these studies were conducted between 2002 and 2009 and also samples were based on the population of interest.

Table 1. General Characteristics of Studies Reviewed

No.	Authors	Year	Design	Data Collection Method	Sample Size	Age Bracket	Sample Base	Sample Selection
1	Gibson et al	2009	Case - control	Interview, Clinical examination	1101	35 to 64	Population	Random
2	Matsuda et al	2006	Case - control	Interview, Questionnaire	480	25 to 65	Population	Recruitment
3	Kwan et al	2002	Case - control	Interview, Questionnaire Clinical examination	640	25 to 65	Population	Recruitment
4	Hampton et al	2007	Case - control	Interview Clinical examination	10953	18 to 79	Population	Census
5	Laudico et al	2009	Cross sectional	Interview Clinical examination	3479	-----	Population	Random

Risk Factors Under Study

At first the investigators identified as many variables or risk factors of breast cancer. These include family history, geographic location, age at first menstruation, age at first birth, present age, civil status, education, smoking and drinking habits, number of children, menstrual cycles, estradiol levels, genetic polymorphism, etc. However, upon observation of the studies investigated these factors are not common to most. Thus, only risk factors that are common to the studies reviewed are included in this present investigation.

A. Age at Menarche

According to Lacey et al (2009) as cited in IARC 2008 that reproductive factors are correlated with prolonged exposure to endogenous estrogens such as early menarche and it is one those important risk factors for breast cancer. Menarche marks the onset of ovarian activity associated with reproduction, and affect breast cancer risk (The Lancet Oncology, 2012). In a study conducted by Collaborative Group on Hormonal Factors in Breast Cancer (2012), younger women were at

menarche, the greater was their subsequent risk of breast cancer, the RR increasing by a factor of 1·050 (95% CI 1·044–1·057, p<0·0001) for every year younger at menarche.

Shown in Table 2 are the risk factors identified by the studies reviewed with their corresponding odds ratios (OR), p-values, sample sizes, the authors as well as the study design. Note that in the studies conducted by Gibson et al (2009) and Hampton et al (2007), the odds of having breast cancer at differing ages at menarche are not significant, with p-values of 0.495 and 0.37, respectively.

B. Age at First Birth

According to the American Cancer Society (2016) that women who had no children or had their first child after age 30 have a slightly higher breast cancer risk overall while having many pregnancies and becoming pregnant at a young age reduce breast cancer risk. MacMahon et al (1980) estimated that women having their first child when aged less than 18 years have only about one-third the breast cancer risk of those whose first birth is delayed until the age of 35 years or more. Births after the first, even if they occur at an early age, have no, or very little, protective effect. The reduced risk of breast cancer in women having their first child at an early age explains the previously observed inverse relationship between total parity and breast cancer risk, since women having their first birth early tend to become ultimately of high parity. The association with age at first birth requires different kinds of etiological hypotheses from those that have been invoked in the past to explain the association between breast cancer risk and reproductive experience.

As shown in Table 2, Gibson et al (2009) study confirmed that women at age 30+ of having first birth have 3.3 times (p=0.032) of having breast cancer compared to those below age 30. In the study of Hampton et al (2007), it showed that the odds are increasing as age increased but it did not confirm the result of Gibson et al (p=0.63).

C. Parity

As previously mentioned above, women who had no children have slightly higher risk of breast cancer. The figures reflected in Table 2 confirmed this result. The three studies reviewed (Gibson et al, 2009; Hampton et al, 2007 & Laudico et al, 2009) showed that the odds of having breast cancer are decreasing when the number of children is increasing. The results indicated that there is an inverse relationship between the number of children and the odds of having breast cancer. As also mentioned in the study of Gibson et al (2009), the parity and the age at first full-term pregnancy were highly correlated with breast cancer. Their findings also include that the ORs decreased gradually to 0.2 for at least five pregnancies compared to none at all. For women with no children, the ORs were higher with increasing age at first full-term pregnancy reaching an odds ratio of 5.4 in those women who had their first child at age 30 or higher.

Moreover, Dulanas (2016) mentioned in her paper which appeared in the International Education and Research Journal, she mentioned that there were studies conducted in China, Taiwan, Singapore, Japan, and South Korea whose findings included that women who are unmarried, nulliparous or with reduced number of full-term pregnancies, older at first full-term, have not breastfed, or who had an early menarche or late menopause, have increased risk for postmenopausal breast cancer. Results of these studies are similar to a Philippine-based research with smaller case-controlled variables.

Table 2. *Odds Ratio of Risk Factors of Breast Cancer in Studies Reviewed*

Risk Factor	OR	p-value	Sample Size	Study	Design
Age at menarche					
< 13	1.00	---	34	Gibson et al	Case Control
13+	1.90	p =	71	Gibson et al	Case Control

		0.495			
< 12	0.80		83	Hampton et al	Case Control
12	1.01		116	Hampton et al	Case Control
13	1.18	p = 0.37	158	Hampton et al	Case Control
14+	0.92		120	Hampton et al	Case Control
Age at first birth					
<20	1.00		9	Gibson et al	Case Control
20-24	1.30		27	Gibson et al	Case Control
25-29	1.20		17	Gibson et al	Case Control
30+	3.30	p = 0.032	20	Gibson et al	Case Control
<25	1.00		65	Hampton et al	Case Control
25-29	0.93		192	Hampton et al	Case Control
30-34	1.01		113	Hampton et al	Case Control
35+	1.07	p = 0.63	48	Hampton et al	Case Control
Parity					
0	1.00		31	Gibson et al	Case Control
1 to 2	0.40		30	Gibson et al	Case Control
3 to 4	0.40		34	Gibson et al	Case Control
5+	0.20	p < 0.001	19	Gibson et al	Case Control
0	1.00		69	Hampton et al	Case Control
1	1.06		59	Hampton et al	Case Control
2	0.99		140	Hampton et al	Case Control
3	0.87		104	Hampton et al	Case Control
4+	0.63	p = 0.002	115	Hampton et al	Case Control
0	3.30		115	Laudico et al	Cross sectional
1 to 2	2.70		161	Laudico et al	Cross sectional
3	1.30		161	Laudico et al	Cross sectional
4 to 5	1.30		244	Laudico et al	Cross sectional
5+	1.00	p < 0.05	193	Laudico et al	Cross sectional

Level of Education

Minimal	1.00		39	Gibson et al	Case Control
Vocational/High School	1.80		43	Gibson et al	Case Control
Tertiary	1.80	p = 0.049	23	Gibson et al	Case Control
Age Stopped Education					
<13	1.00		34	Gibson et al	Case Control
13+	1.90	p = 0.020	71	Gibson et al	Case Control
Boiling Food Using Coconut Milk					
Never	1.00	---	141	Matsuda et al	Case Control
Ever, 12 years	2.78	p = 0.028	26	Matsuda et al	Case Control
Ever, currently	1.08	p = 0.854	17	Matsuda et al	Case Control
Ever, 12 years & currently	3.30	p = 0.003	35	Matsuda et al	Case Control
Body Mass Index					
< 25	1.00		92	Gibson et al	Case Control
≥ 25	1.00	p = 0.898	18	Gibson et al	Case Control
< 22.5	1.00		64	Hampton et al	Case Control
22.5 to 25.0	1.26		86	Hampton et al	Case Control
25.1 to 28.8	1.57		103	Hampton et al	Case Control
≥ 28.9	1.56	p = 0.003	98	Hampton et al	Case Control
First Degree Relatives with BC					
Any	3.00		37	Kwan et al	Case Control
< 50	4.00		23	Kwan et al	Case Control
≥ 50	2.00	p < 0.05	14	Kwan et al	Case Control
No	1.00		358	Hampton et al	Case Control
Yes	1.35		118	Hampton et al	Case Control
2 or more	1.79	p < 0.05	19	Hampton et al	Case Control
Smoking Status					
Never	1.00		110	Gibson et al	Case Control
Ever	1.20	p = 0.486	13	Gibson et al	Case Control
Never	1.00		251	Hampton et al	Case Control
Former	1.09		140	Hampton et al	Case Control
Current	1.00	p > 0.05	92	Hampton et	Case Control

			al		
Alcohol Intake					
No	1.00		115	Gibson et al	Case Control
Yes	0.50	p = 0.191	8	Gibson et al	Case Control
No	1.00		10	Hampton et al	Case Control
Any	1.09		25	Hampton et al	Case Control
1 to 7 drinks/week	1.09		20	Hampton et al	Case Control
> 7	1.09	p = 0.91	5	Hampton et al	Case Control

D. Education

Another variable that the researchers thought to have been contributory to breast cancer is education. In the study by Gibson et al (2009), they investigated whether the level of education and the age at which the person stopped schooling are risk factors of breast cancer. Seen in the above table, both p-values are less than 0.05 (p=0.049 & p=0.020, respectively for level of education and age stopped education). These indicated that the ORs for the mentioned characteristics are significantly different. The figures suggest that as the level of education and the age at which a person stopped schooling are increasing the higher the risk of breast cancer.

E. Boiling Food Using Coconut Milk

Most Filipinos used to eating coconut fruits and make use of other derivatives of coconut fruits such as coconut water and coconut milk among others. In fact, coconut milk is used to mix with different Filipino foods. Many of us are unaware that boiling food using coconut milk may cause breast cancer. An interesting study by Matsuda et al (2006) investigated whether use of coconut milk had some effects to incidence of breast cancer. Results showed that those patients in their study who had been using the method of boiling their foods using coconut milk for at least 12 years have higher risk of breast cancer compared to those who have never and just currently use the method of cooking.

F. Body Mass Index

According to a study by Kim et al (2015) as cited by Dulanas (2016) paper that Asian women who are obese have established risk factor of postmenopausal breast cancer. Moreover, adopting the Western style eating habits among Asian women is correlated with an increased breast cancer incidence. This result was confirmed in the study of Hampton et al (2007). As shown in Table 2, there is an increase in the ORs as the body mass index of the patients in increasing (p=0.003). However, the study of Gibson et al (2009) did not show the same results (p=0.898). They found no significant difference between the ORs of those women whose BMIs are less than 25 kg/m^2 and those who are greater than or equal to 25 kg/m^2 (p=0.898).

According to the Chemicals Health Monitor (CHEM) Trust (2007), a UK-based organization, believed that weight gain and obesity are risk factors for breast cancer in women who have gone through the menopause. They advise that women should adopt a diet that avoids weight gain and for women to engage themselves in physical activity to reduce risk of breast cancer.

G. First Degree Relatives with BC

It is a fact that the incidence of cancer is higher to those whose relatives suffered also from cancer. It was also cited by Dulanas (2016) in her paper that in a study conducted by the American Cancer Society (2016) that the risk of breast cancer is higher among women who have relatives with the disease. The study mentioned that having a close relative (sister, mother, daughter) with breast cancer are twice a woman's risk and having two first degree relatives increases the risk by about three (3) times. This was also confirmed from the two (2) researches reviewed, that is, by Hampton et al (2007) and Kwan et al (2002). Their researches showed that the odd increases as the number of relatives with breast cancer and any other cancer increases.

In comparison, CHEM Trust (2007) claimed that genetic predisposition about breast cancer is inaccurate. Based on their data, for 9 out of 10 women with breast cancer, inherited genes do not seem responsible for the development of the disease. Their results also showed that 8 out of 9 women who developed breast cancer do not have an affected mother, sister, or daughter.

H. Smoking Status

According to Cancer Research in UK (207), smoking has been thought to have no significant effect on breast cancer. However, a number of studies (Johnson, 2005; Ha et al, 20017; Marcus et al, 2000) found out that exposure to cigarette smoking may increase risk of the disease while exposure to second-hand smoke has been found to slightly increase breast cancer risk.

On the other hand, the two studies reviewed found out no significant difference in the odds of having breast cancer for those women who smoke and do not smoke (p=0.486 for Gibson et al, 2009 study; and p>0.05 for Hampton et al 2007 study.

I. Alcohol Intake

The studies of Longnecker et al (1995) and Singletary & Gapsur (2001) have found out that drinking alcohol has consistently increases breast cancer risk for both premenopausal and postmenopausal women. In a collaborative group study conducted in 2002 involving at least 50 researches, results showed that drinking even small amounts of alcohol can increase risk of breast cancer. It was also shown in their study that 8.8% of women who abstain from alcohol developed breast cancer by the time they are 80 years old while those who are drinking, about 11% of them developed breast cancer when they reached 80 years old.

The studies mentioned above contradicted the results of studies by Gibson et al (2009) and Hampton et al (2007). Gibson's (2007) and Hampton's studies found no significant differences in the ORs of developing breast cancer between those who drink and do not drink alcohol (p=0.191 and p=0.91, respectively for Gibson's and Hampton's).

CONCLUSIONS

Based on the reviewed materials, the following conclusions are made:

The following factors contribute to increase in the odds of having breast cancer and considered as risks for women:
- Age at First Birth. In the Philippines, women who gave first birth at 30+ have higher risks of having breast cancer.
- Parity. Breast cancer risk is inversely proportional to the number of children a woman has. The higher the number of children the smaller the chances of having a breast cancer.
- Education. The lower the level of education the lesser the risk of breast cancer.

- Boiling Food with Coconut Oil. Mixing food with coconut oil seemed to increase chances of women to have BC.
- Body Mass Index. In most countries but the Philippines, body mass index also increases the risk of breast cancer.
- First Degree Relatives. Having a first degree relative with BC is also a risk factor of breast cancer. In fact, increases the chances of having the disease.
    The following factors have vague contribution or risks to breast cancer:
- Age at First Menarche, Smoking Habits and Alcohol Intake. These three factors are not found to be a risk of breast cancer. Although most related literature and studies abroad mentioned that these three are also considered as risks factors of breast cancer.

FUTURE DIRECTION

Breast cancer is considered as the most fatal disease confronting the women of today. Many women have lost their battle in trying to fight the disease and have become statistics of breast cancer. Our only weapon to help fight the disease is dissemination through research. This study was conducted to make a wakeup call and again become aware of the risk factors of breast cancer. The intention of the investigators is for those who will be reading this paper to disseminate the results of researches about the risk factors of breast cancer. The only cure to any disease is prevention. Upon reading this paper, people will be aware of the risk factors of breast cancer and will be able to share to their relatives and friends. In this way, breast cancer can be prevented. This paper had identified some risks factors of breast cancer through past researches. It is recommended that genuine data should be used in future studies and may include more factors such as environmental, genes and hormone structure, and other socio-demographic variables. A survival pattern of breast cancer victims should also be investigated to make the study more relevant and useful.

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