Nutrition and Breast Cancer: Is Prevention Possible?

Nalan Linda Fraim¹
Girne American University, Department of Psychology, Mersin 10, Turkey

Abstract
Breast cancer is one of the most feared diseases among women of ages 30 and above. Although not gender specific, breast cancer is predominately seen in women; however, men equally susceptible to the disease but remain a minority. Nutrition is an important aspect of our lives and plays a role in the maintenance of our health, physiological and psychological well-being. However, the consumption of particular foods and mineral compounds has been linked with the prevention of various diseases, including breast cancer. The purpose of this paper is to examine nutritional factors that play a role in preventing the development of breast cancer. Various foods and their impact and role with breast cancer will be evaluated. Also, cultural differences in terms of dietary content and perspectives of how nutrition impacts either the development or the prevention of cancer will be analyzed. Nutritional implications for breast cancer patients will be discussed.

Introduction
Cancer within itself, as a term, is fairly disturbing. The thought of possibly developing any form of cancer is just as terrifying. However, the notion of being diagnosed with cancer and going through certain treatments for cancer is roughly equally devastating for the individual and his/her loved ones (Mathews et al. 2002). Among the varieties of cancers, breast cancer is one of the most frequently diagnosed cancers among women, however, it is not as common in men (American Cancer Society [ACS] 2006).

The plausible cause(s) of cancer have been researched for decades and is still of major concern. Regardless of the type of cancer, recently, nutritional factors are being investigated as to how they pertain to the development and prevention of cancer. Although food choices vary culturally, they also vary on an individual basis as to where not every person will eat every food. The purpose of this paper is to

¹ Lindafraim@gau.edu.tr
examine what cancer is, specifically breast cancer; identify cancer specific nutritional components that play a role in the prevention of development; and discuss the implications nutrition has for health psychologists working with cancer patients and their families.

What is Cancer?

Branonn & Feist (2004) define cancer as a group of diseases characterized by abnormal cell growth and cell activity. Different cancers possess and share different characteristics that are identified through neoplastic tissue cells. Neoplastic cells can either be benign or malignant (Brannon & Feist 2004).

There are four main types of breast cancer: (1) inflammatory breast cancer, (2) Paget’s disease of the breast, (3) invasive lobular cancer, and (4) ductal carcinoma in situ. Inflammatory breast cancer is a rare type of breast cancer and accounts for 1-2% of all breast cancers. The most common signs and symptoms include warmth, redness or swelling of the breast with soreness. Some women may find a lump where others may experience pain in the breast or nipple. Some may have discharge from the nipple or the nipple may be pulled in (ACS 2006, Breast Cancer Care [BCC] 2006, National Breast Cancer Foundation (NBCF) 2006). Paget’s disease of the breast is an uncommon disease that initially shows changes to the nipple. Paget’s disease accounts for less than 5% of all women with breast cancer; however, although rare, men are also susceptible to Paget’s disease. Signs and symptoms of Paget’s disease include a red, scaly rash around the nipple. Paget’s disease usually occurs in one breast (BCC 2006).

Invasive lobular cancer is uncommon and affects 10-15% of all women with breast cancer. This form of cancer can occur at any age but is more commonly seen among women between the ages of 45-55. Although men can be diagnosed with invasive lobular cancer, this is rare. Signs and symptoms include the thickening of the breast tissue (BCC 2006). Ductal carcinoma in situ (DCIS) is an early form of breast cancer that has been described as pre-cancerous, intraductal or non-invasive cancer. Most women with DCIS have no particular symptoms; however, some may experience a lump or thickening of breast tissue. Others may experience symptoms reflective of Paget’s disease (BCC 2006, NBCF 2006).

Other forms of breast cancer include: (1) infiltrating ductal, (2) medullary carcinoma, (3) tubular carcinoma, and (4) mucinous carcinoma. Infiltrating ductal is the most common breast cancer that represents 75% of all malignancies. Medullary carcinoma account for 15% of all breast cancers and usually has a better prognosis among the breast cancers. Tubular carcinoma makes up 2% of breast cancer and has a favorable prognosis of 95% survival rate over a 10 year period. Finally, mucinous carcinoma represents 1-2% of carcinomas of the breast and has a favorable prognosis (NBCF 2006).
There are four stages of breast cancer. Stage I and Stage II are the early stages of breast cancer. Stage I is indicative that the tumor size is no more than one inch in diameter and that the cancer cells have not spread beyond the breast. The survival rate of Stage I is 98%. Stage II means one of the following: (1) the tumor in the breast is less than 1 inch in diameter and the cancer have spread to the lymph nodes under the arm, or (2) the tumor is between 1 – 2 inches or the tumor is larger than 2 inches and has not spread to the lymph nodes under the arm. The survival rate of Stage II is 88%. Stage III is also known as advanced localized cancer where the tumor in the breast is fairly large (more than 2 inches) and the cancer has spread to the lymph nodes in the underarm. For example, inflammatory breast cancer is a form of locally advanced breast cancer. The survival rate for Stage III is 56%. Stage IV is called metastatic cancer meaning that the cancer has spread beyond the breast to other parts of the body as well. The survival rate for Stage IV is 16% (NBCF 2005).

Risk Factors
Certain demographic variable appear to play a role in the development of breast cancer. A woman’s age at the time of diagnosis may aid in facilitation or hindrance of recovery such that it was found that younger women diagnosed with breast cancer were at higher risk of experiencing traumatic stress symptoms after the diagnosis was made (Koopman et al. 2002). Household income is another factor such that Koopman et al. (2002) note that lower income is related to restricted access to medical care and in the case of a cancer diagnosis, the amount of stress and anxiety rises two fold due to the lack of financial resources. Macleod et al. (2004) note that deprived women have lower survival rates from breast cancer and that they reported greater anxiety related to financial issues, health issues and familial problems. It has been suggested that psychosocial adversity increases with the greater degree of deprivation (Macleod et al. 2004).

Meechan et al. (2004) found that level of education was closely related to seeking reassurance following a benign breast cancer diagnosis. They also found that 1/3 of women diagnosed with benign indicators experienced uncertainty about their breast symptoms and lacked reassurance (Meechan et al. 2004).

The National Breast Cancer Foundation (2006) notes that risk factors such as early onset of menses and late menopause, diets in high saturated fats, family history of breast cancer, late or no pregnancies, moderate alcohol intake, estrogen replacement therapy, history of prior breast cancer, being a female, and receiving therapeutic radiation treatment for Hodgkins Disease are contributing factors that aid in the development of breast cancer. Also, after being treated for breast cancer, women who gain weight or continue to maintain an unhealthy weight may result in poor survival rates (Blackburn et al. 2003).
Nutrition and Breast Cancer

As age increases, the incidence of breast cancer also increases but plateaus in the mid-forties and dramatically increases after fifty years of age (NBCF 2006). A large percentage of breast cancer (%50) is diagnosed in women over the age of sixty-five. This implies that regular yearly screenings are a definite necessity for early detection (NBCF 2006).

Worldwide Incidence

According to Woodward & Webb (2001), one of the highest breast cancer rates in the world is found in the United Kingdom. Breast Cancer Care (2005) in the United Kingdom notes that of all the cancers women are diagnosed with, breast cancer accounts for 30% of the diagnoses. The estimated lifetime risk is 1 in 9; meaning that from every 9 women, 1 will develop the disease. In 2002, 13,000 women died from the disease. Eighty percent of breast cancer cases were seen in post-menopausal women. Breast cancer is not a gender specific cancer, as is prostate cancer. In 2001, 290 men were diagnosed with breast cancer; the majority of men who receive a diagnosis are over 60 years of age (BCC 2005).

Drageset & Lindstrom (2003) indicate that Norwegian women have the highest rate of breast cancer in the world; one in every 13 women develops the disease. Montazeri et al. (2000) noted that Iranian women have a higher incidence of breast cancer compared to females in the Western world. Hjerl et al. (2002) indicate that the mortality rates for breast cancer in Denmark are much higher compared to other Nordic countries. With the exception of lung cancer, breast cancer is the most common form of cancer in women and the second leading cause of death (NBCF, 2006).

According to the ACS (2006) estimates that a total of 212,930 new cases of breast cancer will be diagnosed this year (212,240 women, 1,690 men) where 40,410 women will die from the disease – within these cases, 1,690 men will develop the disease and 460 men will die from the disease. The estimated lifetime risk is 1 in 7. Throughout the United States, California has the highest overall cancer incidence (135,030) where 21,170 cases constitute female breast cancer.

When analyzing ethnicity, incidence and mortality, ACS (2006) notes that White women (141.7) have the highest incidence rate compared to African American (119.9), Asian American and Pacific Islander (96.8), American Indian and Alaskan Native (54.2), and Hispanic/Latino (89.6). However, when looking at the mortality rates, African American women (35.4) have the highest rate compared to White (26.4), Asian American and Pacific Islander (12.6), American Indian and Alaskan Native (13.6), and Hispanic/Latino (17.3) women (ACS 2006).
Nutrition and Cancer

The sayings “you are what you eat” or “you eat what you are” indicate that our overall health is related in some form to what we eat. If we tend to continuously eat foods high in carbohydrates and live a sedentary lifestyle, we are not only bound to gain weight but also invite many diseases that are associated with this pattern of living. Maintaining a healthy weight (which may vary amongst individual perceptions), is of course no guarantee that we not encounter any illnesses or terminal diseases throughout our life. However, from the literature, the media, and around us, we are aware that being overweight or even obese will result in various medical problems and diseases.

Women’s Perspectives on Nutrition and Breast Cancer

The perception of having breast cancer and being treated for breast cancer varies among women from different cultures. Many women have displayed differing perspectives regarding the disease and nutrition. Some have indicated that no relationship exists between the two variables; some have confessed that they did not have any information about the subject and some have indicated their belief that a healthy lifestyle and low-fat diet may be beneficial in reducing breast cancer risk (Chapman & Beagan 2003). Also, an alternative perspective offered by some women has indicated that reducing the consumption of certain foods, such as fatty meats and fat intake, while increasing the intake of vegetables, fruits, and fibers may aid in preventing breast cancer (Chapman & Beagan 2003).

Simpson (2003) notes that family members’ beliefs about diet during an illness not only determines the coping mechanisms used but also shapes the recovery process and outcomes. In a study she conducted among Hong Kong women with breast cancer, she found that families and participants believed that oily food contents (cooking oil, peanuts, fatty foods from restaurants, etc.) were believed to have caused the cancer. Also, an interesting finding suggests that certain meats, fish without scales, chicken, chicken skin, and certain seafood products were considered to be primary indicators of cancer where certain shellfish such as shrimp and crab as well as poultry such as goose were the cause of recurrent cancer (Simpson 2003).

Women who have been diagnosed with breast cancer may change their diet in belief that a healthy diet is associated with a low recurrence rate (Beagan & Chapman 2004). In a study conducted by Beagan & Chapman (2004), it was found that more than half of the participants made changes in their diet after being diagnosed. Change of diet included the following actions: increased consumption of fruits and vegetables, grains, fibers, organic and raw foods while reducing the consumption of meats, processed foods, fatty foods, fast food, alcohol, sugar and salt intake. It was also noted that these women altered their cooking methods as well. An interesting finding points to the increased intake of nutritional...
supplements (such as vitamins A thru E, Lechithin, Acidophilus, Iron, Milk Thistle, Calcium, Magnesium; Selenium; Zinc; Grapeseed extract; Melatonin; Garlic; Coenzyme Q10; and an herbal tonic named Essiac (Beagan & Chapman 2004).

The Role of Dietary Compounds in Breast Cancer
Research in the area of breast cancer and nutrition is rapidly growing. Everyday a new chemical compound is reported as either preventative or possible causative in the development of certain forms of cancer. This next section will provide an overview of certain nutritional components that should be taken into consideration when attempting a diet change upon the diagnosis of breast cancer.

Soy Isoflavins
The use of soy is widely recognized as a primary dietary compound in the Asian diet and is a widely chosen food group among vegetarians (Adlercreutz et al. 2000). Soy is rich in protein and oil; however, in the past decade of research of the benefits of soy, it has been found by various researchers that soy was an effective food product in potentially reducing menopausal symptoms, which of course puts soy in a position for being a plausible alternative to hormone replacement therapy (see Shaojung & Knobf 2004 for a review of specific researchers) as well as a potential source of nutrition in the management of chronic diseases (Faraj & Vasanthan 2004). Soy not only has a low fat content but also contains various nutrients inclusive of fibers, vegetable proteins, vitamin B, calcium, iron, zinc, and isoflavons (which are also known as phytochemicals or phytoestrogens that are naturally produced by legumes) (Dail et al. 2001, Shaojung & Knobf 2004). According to Faraj & Vasathan (2004) the choice of soy consumption is a transition from an animal based diet to a plant based diet. It has been suggested that soy and soy products may serve as an alternative form of therapy to prevent breast cancer while reducing menopausal symptoms (Shaojung & Knobf 2004). Dail et al. (2001) found that high consumption of soy intake may be associated with reduced risk of breast cancer among women with high body mass indexes. Adlercreutz et al. (2000) indicate that due to the high consumption of whole-grain rye bread among women in Finland, the breast cancer incidence is much lower compared to the USA and Western Europe.

Natural Carotenoids
Nishino et al. (2000) indicate that the consumption of green and yellow fruits and vegetables is inversely related to the risk of cancer. Nishino et al., (2000) have indicated that carotenoids such as α-Carotene (alpha carotene), β-carotene (beta carotene), lutein (found in various vegetables and fruits), lycopene (which is a phytochemical found primarily in tomatoes), zeaxanthin (found in corn and various
vegetables), and β-cryptoxanthin are promising carotenoids found in our daily foods that have anti-carcinogenic effects and may be beneficial for patients in cancer in prevention (Wane & Lengacher 2006). Djuric & Powell (2001) indicate that lycopene may be associated with the decreased cancer risk based upon the amount of tomato and tomato product consumption. Lycopene is also perceived to be related to the inhibition of tumor cell growth due to antioxidant composition Djuric & Powell (2001). It has been noted that high intake of foods containing lycopene is also related to decreasing chronic diseases (such as cardiovascular diseases) along with various cancers (Agarwal & Venketeshwer, 2000).

**High Folate Diets**
Folate is a water soluble vitamin and has received enormous amount of attention in its role of potentially reducing breast cancer (Sellers *et al.* 2002). However, Sellers *et al.* (2002) indicate that due to the potential inhibitive properties of chemotherapy on folate metabolism and functioning, the amount supplemented must be taken into consideration. Sellers *et al.* (2002) also note that when compared to mammalian cells, tumor cells require much more folate. In their study, Sellers *et al.* (2002) found that high amounts of folate intake prior to being diagnosed was not related to breast cancer survival.

**Fish Consumption**
There have been various debates in the literature regarding the consumption of fish and its role in the prevention of various cancers. Hjartaker (2003) notes that two main omega-3 fatty acids, eicosapentaenoic acid and docosahexaenoic acid appear to decrease the risk cancer; however, this relationship between risk of various cancers and fish consumption has not been clarified. Terry *et al.* (2002) observed an inverse relationship between high consumptions of fatty and lean fish and risk of breast cancer. Terry *et al.* (2002) indicated that no difference in type of fish consumed was associated with reduced breast cancer risk.

**Fat & Protein Intake**
There have been various speculations regarding the effects of fat and protein intake and the risk of breast cancer. Although when East and West are compared, the East believes that high protein intake and oily food consumption is associated with the development of cancer as well as recurrent cancer (Simpson 2003) whereas findings from the West suggest that high dietary fat intake is associated with a higher risk of breast cancer (Boyd *et al.* 2003). Boyd *et al.* (2003) and Sieri *et al.* (2002) also indicate that large meat consumption and high fat intake are markers of higher risk for breast cancer.
In a study conducted by Sieri et al. (2002) it was found that olive oil consumption was not associated with the increased risk of breast cancer. Sieri et al. (2002) suggest that the risk reduction of breast cancer may be associated with the antioxidants tocopherols and polyphenols that are found in olive oil.

**Conclusion**

Among the epidemics of the century, regardless of country, race, gender, and origin, breast cancer appears to be one of deadlier diseases if not detected and treated in ample amount of time. Although breast cancer is every women’s covert fear, it seems that the age of encountering this disease is no longer during menopausal but rather during the pre-menopausal phase of women’s lives between the ages of 30-50. It must not be forgotten that men are equally susceptible to breast cancer; however, the incidence rate is not as high when the genders are compared.

Nutrition is an important aspect of our lives, health, and well-being. Although nutrition choices and food preparation varies culturally, there are specific aspects of nutrition that are global such as vegetable and fruit consumption, fiber consumption, and meat consumption where available. Of course, issues such as access to medical care is of primary concern; however, access to the appropriate foods, education, and social support are other concerns that warrants attention among women diagnosed with breast cancer.

Taking this information into consideration, although preliminary and not extensively detailed, a comprehensive wellness program addressing disease education, nutrition education, physical exercise (which has not been addressed in this paper), relaxation training (yoga, breathing techniques, progressive muscle relaxation, etc.), and support (individual and group counseling) for both breast cancer patients and their families should be developed. For example, in Turkey, no such centers exist. There are many women who are diagnosed with breast cancer every day, who are not educated about the disease, have no knowledge of nutrition, who live a sedentary lifestyle, and have no social support during diagnosis, throughout treatment, and post-treatment. Of course, there are exceptions to the rule where there are individuals who become their own teachers and are knowledgeable about the disease, treatment, process, and outcomes.

The purpose of this paper was to provide an overview of what breast cancer is, the types of breast cancer, recent breast cancer statistics, the importance of nutrition as a preventative factor, women’s views on how nutrition impacts the development of breast cancer, types of nutritional compounds and food consumptions that have been shown to aid in reducing the risk of breast cancer, and implications for future practice. It is this author’s lifetime goal to establish the abovementioned wellness center in Turkey, which is desperately in need for such services because there are
women who are extremely uneducated, have no support, and are dying from this disease due to not have the appropriate tools for survival. Establishing such a center will not only set the foundation for social change but also aid in extending the lives of many women who just give up in the process due to the stigma, shame, and issues related to body image in the event of a mastectomy.

References
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