A qualitative study of female perceptions of the environmental influences and risk factors associated with breast cancer.

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ABSTRACT

Research has shown a strong link between environmental pollutants and breast cancer onset. The aim of this study was to explore the perceptions of females in relation to breast cancer development, its association with environmental influences and other risk factors. Apparatus used were a dictaphone and NVivo 8 software. Six young Dublin females took part in this qualitative research study. Semi-structured, one-to-one interviews took place. Recorded data was coded and analysed using thematic methods. Genetics, age and gender emerged as the top perceived risk factors from this cohort. Results showed the majority of participants did not link environmental factors to breast cancer development. It was concluded that there is a huge lack of knowledge as to this connection within this cohort.

INTRODUCTION

Introduction

The primary purpose of this research project is to investigate available literature to determine the knowledge pertaining to risk factors, especially environmental and their involvement in the development of breast cancer. Academic publications studied will be used to provide an overview of the disease, its incidence, risk factors, mortality rates and prevalence. The predictions for Ireland's breast cancer future are outlined. The role of estrogens in breast cancer development, the association between breast cancer and genetics, lifestyle and the environment will be highlighted. Important results from previous worldwide studies will be detailed assessing perceptions of breast cancer risk factors. Ireland's premier source of information on the subject "Action Breast Cancer's" information handouts and fact sheets will also be examined.

The results of this research uncover an urgent and vital need for education within society as to the environmental factors which have proven to contribute to the onset of breast cancer.

Cancer

Cancer is defined as a disease which develops from "the uncontrolled division of a single epithelial cell that invades the surrounding tissues" (Hogan Casamayou, 2002, p.14). Cancer cells can spread from their place of origin to other parts of the body via the lymphatic drainage system and the bloodstream. This possibility of invading other organs is what makes the disease so lethal (Hogan Casamayou, 2002).

Breast cancer

The term breast cancer refers to "… a malignant tumour that has developed from cells in the breast" (Elhrich & Schroeder, 2004, p.58). The lobules and ducts of the breast were identified as the usual place of origin. These cancer cells may then invade surrounding healthy breast tissue and other parts of the body (National Breast Cancer Coalition Fund (U.S), 2001).

Being a female is considered the most significant risk factor for developing breast cancer (Kopans, 2007; Sloane, 2002): less than 1% of cases occur in men (Kopans, 2007). Increasing age is considered another major predictor of risk: most cases occur after the age of fifty years (Morrow & Jordan, 2003; Singletary *et al*., 2004). Other risk factors include early onset of menarche (onset of menstruation), a late menopause, low parity, late age at first full-term pregnancy, nulliparity (never having carried a child full term) (Stuart-Macadam & Dettwyler, 1995) and family history of the disease (Fentiman, 1999), while breastfeeding is considered a protective factor: research indicates that mothers who breastfeed for a long duration show a significant reduction in the risk of breast cancer development (Stuart-Macadam & Dettwyler, 1995).Regular breast self-examination is recommended as a key

component of an early detection programme that can lead to increased survival (Hailey, 1987).

Breast Cancer incidence Globally

Breast cancer is at present the most common malignancy affecting women in most developed countries, with approximately 1 in 11 women in those countries developing the disease and 1 in 30 dying from it (World Health Association, 2008). Worldwide, approximately one million new cases of breast cancer are diagnosed each year (Bassett, 2005, Duffy, 2006).

The incidence of breast cancer globally has been increasing at about 1 % per year since 1940. In the 1940's, a woman's chance of developing breast cancer in her lifetime was 1 in 22, while today that ratio is 1 in 8 (Gray, 2008). It has been claimed that more American women have died from breast cancer than all Americans killed in World War I & II and the Korean and Vietnam Wars (Cure Zone, 2010). In the United Kingdom, breast cancer incidence rates have increased by more than 50% over the last twenty-five years (Cancer Research Statistics, UK, 2008).

The highest rates of breast cancer in the world occur in the USA and Northern and Western Europe, and the lowest rates are found in Northern, Eastern and Middle African countries as well as Asia (Cancer Research UK, 2008). Within the European Union, every 2.5 minutes a woman is diagnosed with breast cancer and every 7.5 minutes a woman dies from the disease (Cancer Research UK, 2008).

Breast cancer is one of the few cancers where incidence rates are higher for more affluent women and there is a clear trend of decreasing rates from least to most deprived groups. However the survival rates are significantly higher among women from the most affluent areas compared to women living in the most deprived areas (Cancer Research UK, 2008).

Breast Cancer incidence in Ireland

Breast cancer is the second most common cancer diagnosed in Irish women after non-melanomatous skin cancer; 1 in 11 women living in Ireland will develop breast cancer during their lifetime (Breast Cancer Ireland, 2007).

According to the National Cancer Registry (N.C.R.I., 2007), the registered diagnoses for breast cancer in women for 2005, 2006 and 2007 were 2,203, 2,278 and 2,463 cases respectively, showing a slight but significant increase. For males, the averages were 22, 23, and 16 cases for the same period. The county of Dublin showed its incidence rates of breast cancer in females to be higher than those in other counties. 75% of all breast cancer cases are in women over the age of fifty years and 37% are in women over the age of sixty-five years. (N.C.R.I., 2007)

The incidence of breast cancer in Ireland is second highest, after Belgium, among other Western European countries and 19% above the European Union average incidence; the mortality rate is also ranked fourth highest and 17% above the average EU mortality rate (The Women's Health Council, 2009).

Mortality Rates in Ireland

The National Cancer Registry of Ireland (2010) also illustrates the mortality rates for breast cancer. The morality figures for 2005 show that breast cancer was the most common cause of cancer deaths for females at 18% of female deaths. Breast cancer caused 696 female deaths in 2005 but lead to no male deaths, leaving 31.6% mortality rate for women.

Breast cancer predictions for Ireland's future

With the incidence rates increasing, breast cancer is a major issue for the women of our time. Predictions set by the National Cancer Registry of Ireland (2007) show that this increasing trend is set to continue. It is estimated that the confirmed breast cancer rates of 2005 are due to increase by more than 300% by the year 2035. This increase may also be due to the expected aged population that Ireland will have by this time. (N.C.R.I., 2007)

Estrogens and breast cancer

Research indicates that estrogens play a crucial role in breast carcinogenesis (Clemons & Goss, 2001; Manni, 1999; Morrow & Jordan, 2003). Estrogen is a natural female hormone produced by the ovaries which stimulates puberty, regulates the menstrual cycle and breast development, they play a key role in pregnancy and are necessary to maintain healthy bones (Lee Davis, 2001).

In addition to estrogens produced in the ovaries, many women are exposed to synthetic estrogens through oral contraceptive pills, transdermal patches, hormone replacement therapy (H.R.T.), and a wide array of chemicals.

Xenoestrogens are chemicals which mimic the actions of estrogens and are associated with the production of breast cancer through their hormonal effect on breast tissue (Beadle, 2010). "Xeno" means foreign, therefore xenoestrogens mean foreign estrogens (Beadle, 2010). Xenoestrogens can be found in daily use products such us our cosmetics, pharmaceuticals, food supplies, plastics, household products, pesticides, insecticides, herbicides, birth-control pills, H.R.T. and sunscreens.(Beadle, 2010; Gray 200 8).

Breast cancer and genetics

The discovery of the BRCA1 by Dr. King in 1990, and BRCA2 genes by Prof. Stattor and Dr. Wooster in 1994, led to the finding that inherited mutations in both genes played a substantial role in the development of breast cancer (Eaton, 2004).

However, it has become clear that these mutations are not enough in themselves to ensure disease onset (Betta, 2006), accounting for only 5 to 10 % of breast cancer cases (Action Breast Cancer, 2010; National Cancer Institute, 2005).

Over 85% of women who have a family history of breast cancer will never develop the disease, and more than 85% of women with breast cancer have no family history of it. (Cancer Research UK, 2004). This means that a large majority of breast cancer cases are what scientists refer as 'sporadic': cancers that occur for reasons that cannot be easily explained (Ricks, 2005).

It has been stated that in industrialised countries, genetic factors contribute to around one quarter of inter-individual differences in susceptibility to breast cancer, while *environmental* and lifestyle factors contribute the remaining three-quarters (Cancer Research UK, 2004). The importance that both factors play in the onset of breast cancer is shown by the well-documented fact that women who move from countries with low incidence rates to industrialised countries soon acquire the higher risk of their new country (Fentiman, 2002, Gray, 2008, Institute of Medicine, US, 2002). For example, women who immigrate to the USA from Asian countries, where the rates are four to seven times lower, experience 80% increase in risk after living in USA for one decade or more (Gray, 2008).

Breast cancer and lifestyle

Research indicates that there is a link between excessive alcohol use and breast cancer (Morrow & Jordan, 2003; Ricks, 2005; Stoll, 1995): at intakes of 24 grams per day (two drinks) or more, the data support the association between alcohol intake and an increased risk of the disease (Fentiman, 1999). The weight of evidence is also consistent with a casual association between tobacco smoke and breast cancer (Bowcock, 1999; Gray, 2008).

Kelly (1991) suggests that diet plays a significant role in a woman's risk of developing breast cancer. A positive association between breast cancer and animal fat consumption has been observed (Hunt, *et al.,* 2001; Lynch & Hirayama, 1989). In contrast, it is estimated that the risk for breast cancer is reduced by more than half for women who consume five daily portions of vegetables compared to those consuming three portions.

Antioxidants found in a variety of fruit and vegetables are known to protect against cellular impairment which could lead to breast cancer (Donegan & Stricklin Spratt, 2002).

Obesity has also been associated with an increased breast cancer risk for postmenopausal women (Yarbro et al, 2005). It has been argued that a sedentary lifestyle could raise the risk of breast cancer, while physical activity may play a role in its prevention (Harvard Medical School, 2004; Morrow & Jordan, 2003).

Breast cancer and the environment

> *Little has been done to prevent exposure to carcinogenic chemicals in the environment, despite ample evidence that chemical pollution of our air, water, food and the workplace is the major cause of cancer* (Epstein 1990, as cited in Passwater, 1993, p.18).

It has been argued that the rising incidence rates of breast cancer over the decades following World War II paralleled the rapid growth of synthetic chemicals (Gray, 2008). It is estimated that around 80,000 synthetic chemicals are used today in the USA, including a wide range of pesticides, herbicides, plasticizers, chlorinated solvents, dyes, food additives, drinking water disinfection by-products, growth promoters used in food production, and more than one thousand new chemicals are added each year (Gray, 2008). However, toxicological screening data is available for just 7% of these chemicals, and approximately 93% have not been tested for their effects in human health (Bennet & Davis, 2002; Gray 2008).

REACH (2010), the European Community Regulation on chemicals and their safe use, recognises that a significant number of substances have been manufactured and marketed in

Europe for many years, sometimes in very large amounts, without enough information on the hazards they may pose to both human health and the environment.

Harmful industrial chemicals are present in many daily-use items, personal care and cosmetic products, fragrances, household cleaning products, water, food and even in food storage utensils, which introduce hazardous substances into our environment and bodies. Many of which are well-known endocrine disruptive compounds (Breast Cancer Fund, 2010; Chemical Check Monitor, 2010).

New environmental contacts to carcinogenic substances have been created by modern food production methods: pesticides on crops, antibiotics in poultry, hormones in cattle, to name but a few, expose consumers to dangerous chemicals on a daily basis (Gray, 2008). In addition, animal products may retain pesticides and other environmental toxins which they had ingested. Research suggests that these exposures may increase breast cancer risk (Gray, 2008).

In the article *'Cosmetic Companies and Breast Cancer'* by Breast Cancer Action, USA (2000), it is reported that a wide array of cosmetics contain chemicals known as parabens and phthalates, both of which have been identified as estrogenic and disruptive of normal hormone function and are associated with breast cancer (Ley, 2009). One billion pounds of phthalates per year are produced and sold worldwide (Gabriel, 2008). They are found in hundreds of products including make-up, nail-polish, shampoo, conditioners, hair sprays and dyes, all types of creams, lotions, perfumes and deodorants (Silent Spring, 2010).

Cosmetic manufacturers argue that the amounts of these chemicals in cosmetics are minuscule; however it has been demonstrated that a constant very low level exposure to some chemicals can have a larger effect on health than single high levels of exposure (Gray, 2008).

Cosmetics are one of the many sources of daily toxic exposures: the public is exposed to phthalates also from vinyl shower curtains, vinyl car seats, toys, pharmaceuticals and even medical devices (Gray, 2008).

Ample evidence points also to chlorine-based chemicals as significant contributors to breast cancer (Bragg & Bragg, 1999). Chlorine, one of the most commonly manufactured chemicals in the world is a 'highly efficient' disinfectant widely used to 'purify' water (Harding, 2007). According to the U.S. Council of Environmental Quality, *"cancer risk among people drinking chlorinated water is 93% higher than among those whose water does not contain chlorine"* (as cited in Harding, 2007, p.352).

Polycyclic Aromatic Hydrocarbons (PAHs), products of incineration widely found in air pollution, vehicle exhaust fumes and tobacco have also been shown to be carcinogenic and to increase risk for breast cancer (Gammon, 2008). Like other environmental chemicals linked to increased breast cancer risk, PAHs are stored in the fat tissue of the breast (Morris & Seifter, 1992). Plastic Polyvinyl Chloride (P.V.C.), widely used in flooring, wall coverings, countertops, cling wrap, plastic squeeze bottles, toys etc., was one of the first chemicals recognised as a human carcinogen by the National Toxicology Program (USA), and has been linked to increased mortality from breast cancer (Gray, 2008).

Research assessing perceptions of breast cancer risk factors

A qualitative study examining "*African American Woman's perceptions of the role of genetics in breast cancer risk*" was conducted in Atlanta, Georgia, in 2000. The participants in this study, aged between nineteen and forty years, were assessed as to their perceptions of the risk factors of breast cancer. The variables were "...genetics, social environment, physical

environment, and personal behaviour" (Duncan, Parrott & Silk, 2001.pp: 50). Participants had to rate which of these groups was most likely to increase breast cancer risk. Researchers found that genetics was believed to be the highest risk factor, with a mean of 66.84% of the results. Personal factors were second with a mean 14.64% of the result. Environmental factors came third with a mean 9.88% of the result and lastly social factors received a mean 3.5% of the results (Duncan, Parrott & Silk, 2001).

These results are in line with another qualitative study conducted by Spector et al (2009), assessing "*Breast Cancer Risk Perception and Lifestyle Behaviours Among White and Black Women With a Family History of the Disease*". This study was carried out in North Carolina (USA) in order to explore factors involved in the formulation of perceived breast cancer risk and associations between risk perception and lifestyle behaviours in white and black women who did not have breast cancer at baseline, but had at least one sister diagnosed with the disease. Personal interviews were conducted with thirty-two women.

Researchers found that the majority of participants perceived family history and genetics as the most important breast cancer risks. Although a high percentage of the interviewed women believed there was a link between environmental toxins and breast cancer, many were unaware of associations between lifestyle behaviours and breast cancer risk. This study also found that participants' perception regarding control over breast cancer was absent or scarce. This may be due to the fact that most women related breast cancer with non-modifiable risk factors, such as genetics and family history. Only one-third of the women reported healthy lifestyle changes; dietary change was most frequently reported (Spector et al., 2009).

The aforementioned studies also correlate with the research carried out by Yan (2009) exploring the knowledge and perceptions of breast cancer risk factors in 496 Chinese women aged thirty to forty-nine years living in Hong Kong. Over 70% of the respondents considered a family history of breast cancer and prior history of benign breast disease as risk factors and believed the disease was unavoidable (Yan, 2009). All participants of this study were unable to state contributors such as environmental and life-style factors.

These results are coincident with a study conducted by Park *et al*. (2009) with the objective of exploring perceived risk of breast cancer among Korean women and to investigate factors associated with perceived risk of breast cancer through a twenty-one-item questionnaire administered to 1,000 women. They found that family history of breast cancer and a history of breast disease were the only factors associated with higher perceived comparative risk of breast cancer (Park *et al.,* 2009).

A study was performed by Johnson (2008) in the School of Public Health, La Trobe University, Australia, in order to explore young women's perceptions about breast cancer. A convenient sample of six university students in their early twenties was required to participate in a one-hour, tape-recorded, semi-structured interview. Only two main risk factors, age and family history, were identified and myths such as getting hit in the breast caused breast cancer were common.

Information Agencies

Action Breast Cancer is a national programme established by the Irish Cancer Society, whose main function is providing women with information and education about the disease through a website, booklets and fact sheets on breast cancer awareness, breast health and reducing the chances of getting the disease. However, they do not state the powerful evidence linking carcinogenic chemicals to the onset of the disease. The risk factors outlined are early menarche, late menopause, having no children or having them late in life and family history, although 70% of women with breast cancer have none of these factors (Betta, 2006; National Cancer Institute, 2005).

The Irish Cancer Society proposes some steps to reduce the chance of getting all kinds of cancer, such as eating a healthy diet (dismissing pesticide concerns), being physically active, keeping a healthy weight, not smoking or drinking. Once again, limiting exposure to toxins and contaminants is not mentioned as a step to prevent the disease.

The American Cancer Society follows the same path, listing the same risk factors than Action Breast Cancer (Ireland), downplaying the possible connection between chemicals in the environment and breast cancer, by stating that "research does not show a clear link between breast cancer risk and exposure to these substances" (Cancer Org, 2010).

Even though a wide body of literature strongly associates environmental contaminants with the production of breast-cancer (Bennet & Davis, 2002; Gray, 2008; Lee Davis, 2002), women are not well-informed so as to recognise these pollutants as carcinogenic (Gray,

2008). It is evident that breast cancer education does not focus on the prevention of exposure to environmental contaminants. Instead, education relies on a "personal responsibility ideology", which points out the promotion of personal responsibility for health, while obscuring "the risks created by living in a polluted environment and the need for social responsibility with respect to health and disease" (Simpson, 2000, p.67).

Perceptions of risk have been defined as subjective assessments of information that enable individuals understand their vulnerability and make informed decisions about health behaviour (Weinstein, 1999). Therefore, a full and comprehensive understanding of all risk factors associated with breast cancer is of paramount importance since it allows women to take proper preventive action in their health care (Hopwood, 2003).

Conclusions of the literature reviewed

In conclusion there is little doubt that woman's risk of developing breast cancer is affected by a number of variables, some of which are intrinsic, such as sex, age and family history, but many of which are modifiable such as those related to lifestyle choices and exposure to carcinogenic chemicals (The Woman's Health Council, 2006).

The results of the aforementioned studies clearly show that perceptions of risk factors linked to the development of the disease are associated mainly with a family history and genetics, while carcinogenic chemicals are generally not recognised as contributors.

Gray (2008) argues that women are poorly educated in this regard. This lack of education may lead to women taking risky behaviours –for instance, by overexposure to contaminants- which remarkably increases the likelihood of the disease.

Aims of this study

The aim of this qualitative study was to examine the perceptions of females aged between twenty and thirty nine years, residing in Co. Dublin, as to their understanding of associated breast cancer risk factors. A particular emphasis was paid to their knowledge in regard to environmental factors contributing to the development of breast cancer.

The purpose was also to explore further which risk factors women in society were knowledgeable of. It was supposed that the majority of females interviewed would view genetics as the most important risk factor when it came to their chance of developing breast cancer. It was also presumed that the respondents would be unaware as to the risks the environment places on females' breast cancer burden.

METHODOLOGY

The aim of this research project was to explore the perceptions of young females, in relation to breast cancer and its associated risk factors, with special reference to environmental factors and females' awareness of them.

Apparatus

For the purposes of this research study, the apparatus used was a Sony ICD-B300 voice recorder, used to record all interviews. Using a Dictaphone ensured that the entire interview was captured word for word, from start to finish and allowed for transcribing at a later date. To analyse the recorded interviews, the software NVivo 8 was also utilised.

Participants

There was a total of six participants interviewed for this research project. For confidentiality reasons the six participants in this study will be referred to as P.1, P.2, P.3, P.4, P.5 and P.6. These abbreviations represent participant one, two, three, four, five and six in this study respectively.

All the participants were female, aged between twenty and thirty nine years and resided in County Dublin. This demographic was chosen as the burden of breast cancer is more often associated with females and as a residents of County Dublin, they were within proximity to the researcher. All females had completed secondary education, two remaining

at this educational level, two progressed to certificate level, one secured a diploma and one is currently educated to master's degree level. Four of the participants were nulliparous, while the remaining two had successfully bore children. This general information was obtained by the use of a demographic sheet (Appendix.1) which was handed to the participants prior to interview commencing.

Participants were recruited by word of mouth, friends of friends, volunteered to take part in this study as the topic was of interest to them. None of the participants were known to the researcher on a personal level. Their participation was wilful and no payment was received. Participants had a natural interest in this subject and were happy to be of assistance.

Also as this research project focuses on the perceptions of females to environmental influences and other risk factors associated with breast cancer development, an entire female cohort was chosen. A more mature cohort may have been considered better informed. Information is now available to this group, as Breast Check Ireland are now screening females within the fifty to sixty four year age bracket. The younger females' knowledge however is of special interest as in order to prevent the development of this disease, younger females need to be aware of up-to-date relevant information (Breast Check, 2010).

Ethical Considerations

Prior to commencement all aspects of this research project were submitted and passed by the Department of Social Science and the Department of Social Science Ethics Committee. On commencement of each interview, a detailed consent form (Appendix.3) was read, signed and dated by the participant and the researcher. This form informed participants of the interview topic, "Breast Cancer and its Associated Risk Factors". It was also explained that the interview would be terminated at any time should participants decide they did not wish to continue. They were assured that disclosed information would remain confidential and also that no names would be printed in the final research project.

Participants were also made aware that the interviews would be recorded by means of a dictaphone, it was also explained that this was for the purpose of transcription and the researcher's hearing only.

On completion of the interview, participants were given a booklet by Action Breast Cancer entitled "*Know your Breasts*". This free booklet cites known risk factors, (as stated by Action Breast Cancer) and explains how to perform breast self-examinations. It also contains contact information for Action Breast Cancer so that a source for any further information or queries was available to all participants should this interview raise any issues for them.

Design

For the purpose of this research study, qualitative research was employed. Qualitative research methods provide the researcher with a rich source off raw data. Interviews were chosen as the appropriate method of this research. Interviews are useful in gathering vast amounts of material quickly and easily. An informal, semi structured interview (Appendix.4) was created, allowing the perceptions of the participants and not the researcher to unfold. The interview questions were open ended and did not lead the participant to any conclusions, enough room was provided in order to allow participants to draw their own conclusions (Marshall, Rossman, 2006).

Thematic analysis was used to analyse the interviews. The transcribed data was coded in order to find any themes or patterns there in. All codes were grouped into themes and the main themes will be stated in the results section (Marshall, Rossman, 2006).

Procedure

Interviews were carried out on a one to one basis, in the privacy of the participant's home, as this allowed for less interruption and insured the participant felt at ease. All participants were briefed as to the general topic, 'breast cancer and its risk factors', and shown the relevant documentation; the demographic sheet (Appendix.1); the consent form (Appendix.3) and the table entitled "possible risk factors which may increase one's risk of developing breast cancer" (Appendix.2). Ethical considerations were also discussed at this time.

The table of possible risk factors was used as a spring board, to generate some element of thinking for the subject in question. Participants filled in this table by ticking the box appropriate as to one's awareness of possible risk factors. When this was completed the interview began. A semi structured interview was used to allow the females to express their thoughts, feelings, perceptions and knowledge more freely (Appendix.4). Questions one to three were used to build rapport, while questions four to six opened up the topic generally, and question seven to fifteen enabled a brief conversation regarding breast cancer to take place. It was then that the responses to the table were discussed. The subsequent questions one to twenty were constructed to be used as gentle prompts in the event of a topic being avoided. However, they were not needed as all participants explained their choices adequately.

RESULTS

Environmental Factors

The first theme to emerge from the interview process was that of environmental factors. A lack of knowledge within the cohort as to environmental influences associated with breast cancer became immediately apparent. When asked if the effects of the environment could contribute to one's risk of developing this disease, the majority of participants believed that no link existed.

Chemicals found in cosmetics:

Environmental factors such as chemicals found in cosmetics, were dismissed by the majority as a contributing factor to the development of breast cancer. Although participants were aware that chemicals are used in the production of cosmetics, it was generally believed that they would pose no threat to one's health.

> *"Chemicals found in cosmetics, emm (pause) probably no, (pause) not that I know of, but I'm sure there probably is, but they don't tell us (laugh), but I'm not aware of any, no," (P.1)*

> *"Well no, because I don't feel that the chemicals found in cosmetics and stuff could be dangerous," (P.2)*

> *"Chemicals in cosmetics,(pause) I don't know, I have heard stories that chemicals long term can cause damage to skin, not breast cancer, but I wouldn't know what chemicals or what they are in," (P.4)*

However, of the entire cohort, one single participant was aware that environmental chemicals can contribute to one's risk of developing breast cancer. This participant

explained that this knowledge was imparted to her by her mother, the owner of an organic shop with a keen interest in educating others as to the detrimental effects that man-made chemicals have on human health.

> *"Chemicals, yeah they do, I know from my mam having the organic shop all the different parabens found in cosmetics which cause cancer ... I know the likes of anything you use yourself, well my mam says that sixty percent is absorbed into the blood stream, so even washing powder I use organic," (P.3)*

The use of deodorant:

The second environmental risk factor to emerge was the participant's perception of the danger of the use of deodorant. However once again it was a minority of the participants who mentioned deodorant when asked about environmental risks. P.3 in this study (whose mother was the proprietor of an organic shop), was again highly knowledgeable in regard to the association of deodorant use and the development of breast cancer.

> *"One of the main things which I would use is the deodorant that has no parabens in it, they say because it is so close to the lymph nodes that it can cause problems, but it's only through my mam that I know all that, I wouldn't think a lot of other people know it," (P.3)*

> *"The one thing that springs to mind is the deodorants, aerosol deodorants, I have heard that they can increase the risk and that they shouldn't be used," (P.1)*

The use of plastics:

Lastly the dangers associated with the use of plastics and its link with breast cancer development was identified by the minority. They expressed concern relating to the possible link between the use of plastics and the development of this disease.

> *"Food containers, for example in the organic shop has very little plastic it's cardboard or delft, so chemicals aren't used as much, it's mostly foods that I'd know about though (pause), even pollutants in the air, I mean there is so much out there," (P.3)*

> *"I know about plastic bottles, if you have a bottle of water in the car and that bottle of water is heated up by the sun then the chemicals in the bottle transfer to the water, if you drink that water then you're drinking the chemicals, so I know that increases your risk of breast cancer…I read that somewhere." (P.5)*

Lifestyle Factors

The second theme to emerge was lifestyle factors. Alcohol use above the daily recommended units, lack of exercise, being overweight and smoking were the lifestyle factors discussed. The majority of the participants did not recognise these factors, all of which can be managed by the individual and are therefore modifiable, as being able to increase one's risk of developing breast cancer.

Alcohol:

Although there was sufficient knowledge regarding females recommended daily allowance of alcohol, the risks of intake beyond that level was not viewed as a contributor to breast cancer. However it was cited as grounds for other health damage.

"Alcohol consumption I don't think that matters … I think it's two units per day for women" (P.6)

"Not for breast cancer, probably for pancreatic cancer or liver damage, yeah … recommended is emm, fourteen in a week so I presume two per day," (P5)

"Alcohol, no I don't think it affect it," (P4)

Exercise:

While the majority of participants stated that they made efforts to be more physically active in their daily lives, their decision was not fuelled by a desire to remain breast cancer free. The majority of participants could not recognise the link existing between lack of exercise and its impact on the onset of the disease. One participant stated that her decision to exercise was made in connection with a desire to stay slim.

"Emm lack of exercise I put down that I don't believe it … I think you can be within your healthy weight range and not do a bit of exercise and it wouldn't contribute so I'm not sure how exercise would go towards it … I try to exercise but it's more for weight, so vanity more than anything else " (P2)

"Exercise I don't think is a risk at all … I try do a bit of walking every day but that's because it helps me sleep better, (P4)

Smoking:

The ample advertising and well-proven evidence of the relationship between smoking and lung cancer ensures that all participants in this study were aware of the association. However, the link between smoking and breast cancer was not known.

> *"Smoking, well that definitely causes lung cancer, sure it says it on the packet, but I'm not sure about breast cancer," (P5)*

> *"Smoking, well your hear it related to loads of stuff but breast cancer, I don't know, I'm unsure," (P6)*

Being overweight:

The issue of being overweight was also disregarded as being of importance when discussing one's breast cancer burden.

> *"Being overweight, well it's unhealthy, but I can't see how it relates to breast cancer," (P2)*

> *"Emm being overweight and breast cancer, well I don't really see a connection," (P5)*

Perceived Risk Factors

The third theme to arise from the interview process was the *perceived risk factors* associated with breast cancer risk. Throughout the interviews it became apparent that all participants assumed the same risk factors as being the most important. The top three identified risk factors were stated as genetics, age and gender.

Genetics:

Genetics was identified as one of the most widely accepted risk factors for breast cancer development. All participants associated genetics with an increased breast cancer risk and distinguished a previous family history as the single most contributing factor.

> *"Obviously genetics, that's the top one ... well if there's a family history you are more likely to get it to, the possibility is higher if a parent or grandparent has had it that makes you more at risk," (P.5)*

> *"Genetics, I think that it's the highest because you always hear of girls whose aunties or whatever has had cancer and you hear of it getting passed on and they get checked for it earlier," (P.6)*

Participants stated that if females within a family had suffered this disease, the chances of their relatives developing it were increased and therefore early screening detection was practiced.

> *"Well I would say genetics was one of the top definitely ... I have known people who have a family history of breast cancer and they have to get checked regularly so obviously it's a risk, (P.2)*

> *"Emm family history I ticked yes because you do here that if there is a family history, you do hear that they screen people younger, emm as far as I understand that happens when there's a history of breast cancer," (P.1)*

Age:

All participants also highlighted age as another important risk factor. Participants showed some understanding of the age brackets most at risk; an increase in age was associated with an increase in risk.

> *"Age is definitely a risk factor, most at risk I think is over fifty, emm, because they are the woman that they send for the mammograms," (P.1)*

> *"Age, yeah it's a factor definitely, I think it's a known risk factor as I said over fifties are most at risk," (P.4)*

> *"Well I think as regards age the older you get the more your body is starting to wear down, and I think your health becomes riskier in relation to cancer … I don't think I have ever heard of somebody in their early teens getting breast cancer," (P.2)*

Gender:

The participants in this study, being all female were aware that the issue of breast cancer is predominantly a female one, making gender highly significant. The majority of participants wrongly stated that men do not have breasts and that is why they believed this disease affects only females.

> *"Gender well I don't think that men could get breast cancer, you know I don't consider men as having breasts (laugh) but I don't know if that's a stupid statement, emm, but I definitely do think it's female," (P.2)*

> *"Gender, well being female is a risk as women are the ones who have breasts," (P.6)*

> *"Gender, yeah because I just thought only women get it, that's what I have heard of, so it has to be more women than men making gender a risk factor," (P.5)*

Areas of Ignorance

The fourth theme presented was ignorance surrounding most risk factors. The areas which showed the most lack of knowledge in connection with the development of breast cancer were the late onset of menopause, an early menarche, the use of Hormone Replacement Therapy, having children late in life (after thirty years of age) and nulliparity.

A late onset of menopause:

None of the participants were conscious of the link between a late onset of menopause and an increased breast cancer risk.

> *"Menopause at a late age, I haven't a clue about, I wouldn't know," (P.1)*

> *"Menopause at a late age, I don't know if that's a factor, like I believe age is a factor, just because you go through menopause late, I don't think it'll mean that you've increased your risk of breast cancer, I just don't know," (P.2)*

Early menarche:

There was also a huge lack of knowledge about the risk factor associated with an early menarche. The females in this study were not aware of any connection between an early menarche and breast cancer risk.

> *"First menstruation at an early age, no I don't think that makes a difference sure that can happen to a girl at anywhere between eleven and sixteen or seventeen, I don't think it matters, and when you fill out any questionnaires about your physical health they never ask you about menstruation so I don't think that matters at all no, I can't see what bearing that has on any real aspect of your health," (P.2)*

> *"First menstruation at an early age, I haven't a clue if that's significant or not," (P.4)*

Having children late in life:

It emerged that giving birth to children after thirty years of age was also a huge area of ignorance. Participants in this study did not connect having children at this late age with and increased risk of developing breast cancer.

> *"Same with having children after thirty, I don't think that's' a risk factor," (P.2)*

> *"The same with having children over thirty, I just never heard anything about that," (P4)*

> *"Having children over thirty, I don't know about that, I wouldn't think so," (P.6)*

Hormone Replacement Therapy:

There was a significant lack of knowledge in relation to Hormone Replacement Therapy and its connection to an increased risk of developing breast cancer.

> *"The use of the H.R.T., I'm unsure I have never heard anything about it at all, and my mam hasn't gone through the change yet so I wouldn't have reason to know anything about it," (P.3)*

> *"H.R.T., I have never heard of it affecting anything so no," (P.5)*

> *"H.R.T., I don't know anything about it I have never heard of H.R.T. actually (laugh)," (P.6)*

Nulliparity:

All participants (four of whom were nulliparous and two having given birth) were unaware of any connection between never having carried a full pregnancy and the development of breast cancer.

> *"Never being pregnant, no I don't think it's a risk factor, I think you get it or you don't regardless of having children," (P.1)*

> *"Never being pregnant No I don't think so, like there's no question here about whether you breast feed so I don't think that that has anything to do with it either if you did have children so I don't believe that never being pregnant would have any indication," (P2)*

Protective Factors

From the analysis reviewed, the protective factors against breast cancer presented as the fifth and final theme. Three areas of prevention clearly emerged from the participants interviewed, cited as a healthy diet, breastfeeding and self checks.

Healthy diet:

While discussing diet in relation to the table used, the possible risk factors to emerge was a healthy diet, which presented as a protective measure against breast cancer development. The majority of participants believed that eating healthily could lead to health benefits and a decreased breast cancer risk.

> *"I'd did read an article only two days ago in the Hello magazine and it was going to the food groups that you can eat that reduce your risk of*

> *getting cancer, some of the foods were, (pause) well eating broccoli is anti carcinogenic and there's emm (pause) walnuts or pecan nut, I know diet can affect your chance, and can decrease your risk," (P. 1)*

> *"Well yeah, I know you should eat your greens and your antioxidants and your antitoxins, your fish oils, and things that keep your system and your bloods healthy, you know eating health, they would help everything really,"(P.2)*

> *"Definitely eating healthy has an impact on cancer, just avoid fats in relation to diet ... I'm a vegetarian so I eat a lot of tofu and no meat" (P.4)*

Breast Feeding:

Half of the participants cited breast feeding as a protective factor in the development of breast cancer. One of the participants who proffered that view had bore her own child.

> *"I don't know if this is true but, I heard, if you breast feed it reduces your risk of breast cancer emm (pause) so how true it is I don't know, it something I heard," (P1)*

> *"I think that show I was telling you about said to breast feed as it would decrease your risk, or maybe that was increase you risk (pause) it was a while ago since it was on but I think breast feeding did help reduce your chances," (P3)*

> *"I know breast feeding can help reduce it, my sister told me that, she had a little boy and breast fed him, that's how I know," (P5)*

Self checks:

A minority of participants suggested that conducting regular self checks would be a protective factor in the management of the disease, as early detection could lead to a higher survival rate.

"Well checking yourself is one that would be of importance, the early you catch it the better chance of survival" (P5)

"Check yourself regularly, early detection is paramount," (P6)

DISCUSSION

The main research question for this research project was: "What are the perceptions of females in our society, as to the environmental influences and other risk factors associated with the development of breast cancer?"

The aim of this current research was to determine knowledge held by young females with regard to environmental influences and which risk factors were perceived as paramount. It was theorised that a previous family history of the disease would be considered as the most important factor and that little would be known of any existing links between the environment and breast cancer development. This section sets out to discuss the findings as stated in the results section and to compare them with previous research.

The first and strongest theme to emerge from the thematic analysis was 'environmental factors'. It was evident that the majority of participants did not link environmental contaminants with any increased breast cancer risk. Within the cohort, only one single participant was aware of the connection between breast cancer and any environmental contaminants. It emerged during the interview with P.3 that her mother was the proprietor of an organic store and she imparted her knowledge onto her daughter, subsequently providing her (P.3) with information about carcinogenic substances.

These findings coincide with previous research. Research conducted assessing perceptions of risk factors of African American females in Atlanta, Georgia, U.S.A. in 2000, showed that of the entire female focus group 66.84% stated that genetics was the top

contributing factor; while environmental factors received just 9.88% of the vote (Duncan, Parrott & Silk, 2001).

The second theme to emerge was lifestyle factors. Alcohol intake, being overweight, lack of exercise and smoking were recognised as having a negative impact on one's health. However, there was no connection between these variables and the onset of breast cancer. These findings are comparable with research carried out by Spector *et al.* (2009) in North Carolina, U.S.A., where white and black females (with a female relative who had breast cancer) were assessed for their perception of lifestyle factors and a family history of the disease. The research showed that many of the thirty two participants did not identify the link between lifestyle factors and breast cancer risk.

Another recent study conducted in Hong Kong by Yan (2009) aimed to assess perceptions of breast cancer risk factors with the use of a questionnaire. It found that none of the 496 female participants were knowledgeable of any environmental or lifestyle contributors to the development of breast cancer, rendering it comparable with the results of this study.

It was evident that these women were not educated as to the fact that as much as three quarters of breast cancer cases are linked to environmental or lifestyle factors (Cancer Research UK, 2004). Research indicates that women who migrate from low incident rate countries to a higher incident rate one, will acquire that higher rate within ten years of migration (Fentiman, 2002; Gray, 2008; Institute of Medicine, US, 2002).

The strong, well proven link between environmental chemicals present in a multitude of daily use products and their relation to breast cancer is well documented within both European and US literature and publications (Brody et al, 2006; Gray, 2008; REACH, 2008; Passwater, 1993). However, women participating in this study and the aforementioned research studies on perceptions of risk factors, highlight a dangerous gap in the outcome of this literature ever reaching them. Simpson (2007) illustrates that society does not take responsibility on the hazards associated with living in a highly contaminated toxic environment. Therefore, females are left with personal responsibility for their health while the role of numerous environmental factors which play a role in the development of breast cancer are clouded over. Only an increase in knowledge will allow females to make the correct choices regarding their health and subsequently their breast cancer risk.

The third theme to arise in this research was 'perceived risk factors'. These were stated as being genetics, age and gender. All participants in this study presumed that genetics was the top risk factor in breast cancer development. This coincides with a study undertaken by Park *et al*. (2008) which showed that of the 1,000 Korean female participants, all identified genetics and a family history of breast disease as the only risk factor for breast cancer development.

However, it has been proven that genetics is not enough in itself to ensure disease development (Betta, 2006) and only accounts for only 5 to 10% of cases (Action Breast Cancer, 2010; National Cancer Institute, 2005). Once again, the perception of the cause of the disease is related to a 'personal responsibility' in that genetics are portrayed as an unavoidable factor in its development, even though more than 85% of women who develop breast cancer have no family history of the disease (Cancer Research UK, 2004).

The association between age and breast cancer as found in this study is supported by the findings of a study carried out by the school of Public Health, La Trobe University, Australia, where six females identified age as being a contributing factor of breast cancer risk (Johnson, 2008).

Action Breast Cancer also identified increased age as a risk factor, with up to 75% of breast cancer diagnosis occurring in females over fifty years of age (NCRI, 2007; Morrow & Jordan, 2003; Singletary *et al*., 2004). Breast Check Ireland (2010), a government funded body, is now offering a free screening service to females between the ages of fifty to sixty five, as this age bracket are perceived to be at a higher risk.

Participants of this study correctly identified gender as a female risk factor. Although males and females are both susceptible to developing this disease, the majority of participants dismissed the concept that men could develop breast cancer, which was attributed to their incorrect assumption that males do not 'have breasts'. However, males can suffer from breast cancer, although only less than 1% of cases occur in males (Kopans, 2007). This coincides with information from The National Cancer Registry of Ireland (2007) who report that females have a 100% greater chance of developing this disease than males.

Estrogens, natural occurring female hormones essential for the development of the female reproductive system, have been proven to play a major role in the onset of cancer of the breast (Clemons & Goss, 2001; Lee Davis, 2001). Yet, none of the cohort in this study was aware of any connection.

As well as naturally produced estrogens, females are now saturated with xenoestrogens (chemicals which mimic the action of natural estrogens) which remarkably raises the chances of contracting the disease (Beatle, 2010; Gray, 2008; Lee Davis, 2001). Gender cannot be changed and natural occurring estrogens may be difficult to modify. However, it could be said that if the consequences of overloading female bodies with xenoestrogens was advertised and widely known in society, females could definitely exercise more control over their potential health risk.

The fourth theme to emerge in this study was the areas of ignorance. Even though the entire cohort was female, an immense lack of knowledge surfaced regarding many female issues. The late onset of menopause, an early menarche, bearing children after thirty years of age, the use of hormone replacement therapy and being nulliporus, which are all regarded as contributors to breast cancer, were not linked to an increased risk. Stuart-Macadam & Dettwyler (1995), as well as Action Breast Cancer Ireland (2010), have cited the above as contributors to an increased breast cancer risk. It is important to mention that, despite the fact that HRT has proven to increase the chances of breast cancer, it is still widely prescribed to menopausal women (Beadle, 2010).

The last theme to emerge in this study was protective factors. A healthy diet emerged first and was identified by all participants in this research, along with breastfeeding and regular self-checks.

All participants recognised the importance of a healthy balanced diet. The consumption of vegetables and antioxidants was highlighted in this study, which correlates with Johnson Birkimer (2002) who maintains that a diet rich in vegetables (at least five

portions per day) and antioxidants have a protective effect, decreasing the risk of acquiring the disease by half. However, unbeknown to most of society, harsh chemicals are present in our everyday food, which can be contaminated with a wide array of pesticides, hormones, antibiotics, etc (Gray, 2008).

Half the participants in this study distinguished breastfeeding as another protective measure of lowering one's breast cancer risk. This relates to Stuart-Macadam & Dettwyler (1995), who maintain that mothers who breastfeed show a substantial reduction in the risk of breast cancer development. Ironically, of the two mothers in this study, only one was knowledgeable regarding the anti-carcinogenic benefits of breastfeeding.

Breast self-checks was listed by a minority in this study as a protective measure, even though these participants recognised the advantages of regular breast self checks, they admitted to not carrying them out regularly, stating that their self-examinations was done sporadically as it was something which they 'never remembered to do'.

Limitations

As the total cohort of this research project comprise of only six participants, who resided in County Dublin, it cannot be construed that the findings are representative for Dublin as a whole. A further study would benefit from a larger sample to find a truer representative of society at large.

Also, as Dublin was stated as having the largest breast cancer incidence rates in Ireland, by the National Cancer Registry of Ireland (NCRI 2007), participants currently

residing in Dublin were used, a study from a broader geographical area would provide a more generalised result.

Finally, for the purpose of this study a sample of females between twenty to thirty nine years of age were used. Further studies could use a wider age bracket so that perceptions from varying maturity levels could be analised.

CONCLUSION

Literature reviewed has highlighted breast cancer incidence and mortality rates at epidemic proportions for females of today. Globally, in most developed countries, a female has a 1 in 11 chance of acquiring this disease, and a 1 in 30 chance of dying from it. Within the European Union, every 2.5 minutes, a female is diagnosed with breast cancer and every 7.5 minutes a female dies from this disease.

The findings of the current research coincide with the previous international research as cited in this paper showing evidence that most females in various societies are ill informed of their own breast cancer risk factors.

Even though Action Breast Cancer (2010) , Cancer Research UK (2004) and National Cancer Institute USA (2005) accept the findings that genetics play a mere 5 to 10% role in breast cancer onset and environmental and life style factors attribute up to 75% of cases, little is done to inform females of this risk. It could be concluded that if females were educated in this regard they could make more informed choices which could result in a decrease in incidence rates.

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Appendix 1

Demographic Sheet

Please tick the boxes appropriate:

Gender	Male	
	Female	
Age	20 - 25	
	26 - 29	
	30 - 35	
	36 - 39	

Education What levels of education have you completed?

Primary School	
Secondary School	
Certificate	
Diploma	
Degree	
Masters	
PhD	

Children	Yes	
	No	

Residence Are you currently living in Dublin?

Yes	
No	

Appendix 2

Please tick the box where appropriate:

Possible risk factors which may increase your risk of developing breast cancer	Yes (this is a known risk factor)	No (I do not believe this is a risk factor)	Unsure (I do not know whether this is a risk factor or not)
Age			
Gender			
Genetics (family history of the disease)			
Menopause at a late age			
First menstruation at an early age (Menarche)			
Never being pregnant (nulliparity)			
Having children after 30			
Being over-weight			
Lack of exercise			
Diet			
Smoking			
Stress			
Alcohol consumption			
Use of contraceptive pill			
Use of HRT (hormone replacement therapy)			
History of benign breast lumps			
Exposure to radiation			
Chemicals (found in cosmetics, plastics, etc.)			

Appendix 3

INFORMED CONSENT FORM:

FINAL YEAR RESEARCH PROJECT

Dublin Business School requires that all persons who participate in research studies give their written consent to do so. Please read the following and sign it if you agree with what it says.

I freely and voluntarily consent to be a participant in the research project on the topic of "breast cancer" to be conducted by Elaine Murphy as principal investigator, who is an undergraduate student in the School of Arts at Dublin Business School. The broad goal of this research study is to explore the perceptions of woman in our society, as to the risk factors which are known to us, that may contribute to our risk of getting breast cancer. Specifically, I have been asked to attend an interview, which should take no longer than 45 minutes to complete.

I have been told that my responses will be kept strictly confidential. I also understand that if at any time during the interview I feel unable or unwilling to continue, I am free to leave. That is, my participation in this study is completely voluntary, and I may withdraw from it at any time without negative consequences. In addition, should I not wish to answer any particular question or questions, I am free to decline. My name will not be linked with the research materials, and I will not be identified or identifiable in any report subsequently produced by the researcher.

I have been given the opportunity to ask questions regarding the interview, and my questions have been answered to my satisfaction. I have been informed that if I have any general questions about this project, I should feel free to contact James Brunton at james.brunton@dbs.ie.

I have read and understand the above and consent to participate in this study. My signature is not a waiver of any legal rights. Furthermore, I understand that I will be able to keep a copy of the informed consent form for my records.

_____ _____

Participant's Signature Date

I have explained and defined in detail the research procedure in which the respondent has consented to participate. Furthermore, I will retain one copy of the informed consent form for my records.

_____ _____

Principal Investigator Signature Date

Appendix 4

Interview Questions

Q.1Can you tell me a bit about yourself?

(Job/hobbies, **describe** yourself)

Q.2) Can you tell me about your family?

(oldest/youngest, brothers/sisters, mom/dad, your own children)

Q.3) Would you consider yourself a health conscious person?

(exercise regularly, eat healthy, healthy weight etc...)

Q.4) Does the term "breast cancer" mean anything to you?

(what comes to mind.....)

Q.5) Has anyone you know suffered from breast cancer?

(aunt, uncle, grandmother....)

Q.6) So you mentioned that you are/aren't health conscious....do you believe that staying healthy can influence your risk of getting breast cancer?

(if yes, do you know in what ways/how....)

Q.7) Are you aware of the various breast cancer agencies?

(Action Breast Cancer, Marie Keating Foundation)

Q.8) Have you ever approached these agencies in search of information?

(if yes, how did you find the **quality of info**/them.....**where/how** did you find?)

Q9) Are you aware of the pink ribbon?

(what it stands for?)

Q.11) Have you ever received any information oral or written regarding breast cancer?

(if yes, where from-mother, school, GP. etc...)

Q.10) In your opinion, who should be responsible for giving people this information?

(School, GP. Government e.g. Dept of Health and children.ie breast check 50/65yrs)

Q.11) Would you consider yourself to be a breast aware person?

(perform self checks-if yes **when** and **who** showed you)

Q12) Do you consider it possible for men to get breast cancer?

(have you heard of any...)

Q.13) Are you aware of any incidence rates for breast cancer in Ireland?

(diagnosis, mortality rates..)Q.14) Are you aware of which age brackets are most at risk of developing breast cancer?

Q.15) In your opinion, can manage your own risk of developing cancer?

Now let's discuss the table. If you would like to just talk me through your responses and tell me a little bit of why you ticked the particular box for each.

The following are a list are prompts and will be used only if necessary:

Q.1) Is age a factor?

Q.2) What about gender?

Q.3) How important a role, do you think our genes play in our risk of developing this disease?

Q.4) What do you know of a late menopause?

Q.5) What do you know of an early menarche?

Q.6) Can having children affect your risk?

(having children & before 30....)

Q.7) Can being overweight affect your risk?

Q.8) What about lack of exercise?

Q.9) In relation to diet, do you believe that the food we eat can contribute increase or decrease your risk of developing breast cancer?

(Which ones ... canned food, meat, animal fats-fresh fruit and veg.)

Q.10) Do you consider that smoking can affect your risk of developing this disease?

Q.11) Do you think that stress is a risk factor?

Q.12) Do you believe that drinking alcohol can affect your risk of developing this disease?

Are you aware of the quotas for woman, units/day)

Q.13) What about taking the contraceptive pill, do you believe that this can affect your risk?

Q.14) Do you believe that taking the HRT (Hormone Replacement Therapy) affect your risk?

Q.15) Does having a history of begin breast lumps increase your risk of developing this cancer?

Q.16) Can an exposure to radiation affects your risk?

Q.17) Do you think that environmental factors, such as chemicals, can contribute to your risk?

(e.g. parabens in creams/shampoo, fertilisers, BPA in plastics)

Q.18) Of the risk factors which you have ticked, which are the most relevant?

(what is first, second, third.....)

Q.18) Do you know of any preventative/protective factors?

Q.19) Is there anything that can be done to improve awareness of risk factors?

(put risk factors into perspective)

Q.20) Now, is there anything you can think of that you would like to say that I have not thought of asking you?

Here is some information for you, form Action Breast Cancer, it explains how to check yourself and also gives information regarding some risk and protective factors, should you have any further questions, do not hesitate to contact them, you will find their contact details within the booklet. Thank You.