Assessment of awareness, perception, specific knowledge, and screening behaviour regarding breast cancer among rural women in Ipokia Local Government Area, Ogun State, Nigeria

Ademola M AMOSU[1]; Adenike M DEGUN[2]; Adebo M THOMAS[3]; Abraham O BABALOLA[4]

[1]*Department of Nursing Science, Lead City University, Ibadan, Nigeria*
[2]*Obafemi Awolowo University Teaching Hospital, Ile-Ife, Nigeria*
[3]*Department of Anatomy, Bowen, University, Iwo, Nigeria*
[4]*Department of Nursing Science, Babcock University, Ilisan-Remo, Nigeria*

_____

ABSTRACT

The objective of this study was to evaluate the level of awareness, perception, specific knowledge, and screening behaviour towards Breast Cancer among rural women in Ipokia local government area of Ogun state, Nigeria. It was a cross-sectional design study, utilizing a pre-tested 36-item questionnaire (Cronbach's alpha of 0.62) to collect information about knowledge regarding Breast Cancer, perceived susceptibility and seriousness, perceived benefits of screening and screening behaviour among women in the study location. One thousand, one hundred and ninety-four respondents were recruited for the study by systematic random selection of women in the community. Results indicated that the mean age of participants was 28.24 (Standard Error of Mean (SEM) 0.47) years. An appreciable number of the respondents, 672(56.3%) were married, 58.1% have primary school education, 17% obtained senior secondary school certificate as their highest level of education while 24.9% have no formal education. There were 466(39%) Muslims, 19.7% Christians and 41.3% traditional religion worshipers among the participants. Knowledge about breast cancer as an important disease in women measured on a 12-point scale recorded a mean score of 4.97 (SEM 0.15) and perception of breast cancer considered in three sub-domains of susceptibility, seriousness and benefit, measured on a 30-point scale, recorded a mean score of 17.65 (SEM 0.18); while screening behaviour, measured on an 11-point scale, showed that respondents recorded a mean score of 2.40 (SEM 0.071). Also 468(39.2%) of the respondents reported having heard about breast cancer while 1131(94.7%) have heard of gonorrhoea as a condition affecting women. The findings suggest that the level of awareness about breast cancer among women in this study was low while their level of perception was just above average and screening behaviour was very low. Again, perception variables positively and significantly correlated with screening behaviour among the participants. There should be a serious awareness drive, education and communication strategies packaged towards these women, to reinforce their positive trends. An aggressive health promotion intervention must be urgently designed so as to encourage regular screening for breast cancer among women in the rural communities.

Keywords: Breast cancer, perception, knowledge, screening for breast cancer.

_____

INTRODUCTION

Breast cancer is cancer originating from breast tissue, most commonly from the inner lining of milk ducts or the lobules that supply the ducts with milk. Cancers originating from ducts are

_____

known as ductal carcinomas, while those originating from lobules are known as lobular carcinomas. It is the commonest cause of cancer death in women worldwide. Among women in the USA, breast cancer remains the most commonly diagnosed cancer, excluding skin cancers, and the second leading cause of cancer-related deaths. Rates vary about five-fold around the world, but they are increasing in regions that until recently had low rates of the disease.

Many of the established risk factors are linked to oestrogens. Risk is increased by early menarche, late menopause, and obesity in postmenopausal women, and prospective studies have shown that high concentrations of endogenous oestradiol are associated with an increase in risk. Childbearing reduces risk, with greater protection for early first birth and a larger number of births. Breastfeeding probably has a protective effect. Both oral contraceptives and hormonal therapy for menopause cause a small increase in breast-cancer risk, which appears to diminish once use stops.

Alcohol increases risk, whereas physical activity is probably protective. Mutations in certain genes greatly increase breast-cancer risk, but these account for a minority of cases. The primary risk factors for breast cancer are sex [1], age [2], lack of childbearing or breastfeeding [3], higher hormone levels [4][5], race, economic status and dietary iodine deficiency [6][7][8]. Smoking tobacco also increases the risk of breast cancer with the greater the amount being smoked and the earlier in life smoking begins, the higher the risk [9].

In more recent years, research has indicated the impact of diet and other behaviours on breast cancer. These additional risk factors include a high-fat diet [10], alcohol intake [11][12], obesity [13], and environmental factors such as tobacco use, radiation [14], endocrine disruptors and shift work [15]. Although the radiation from mammography is a low dose, the cumulative effect can cause cancer [16] [17].

In addition to the risk factors specified above, demographic and medical risk factors include:
- Personal history of breast cancer: A woman who had breast cancer in one breast has an increased risk of getting a second breast cancer.
- Family history: A woman's risk of breast cancer is higher if her mother, sister, or daughter had breast cancer; the risk becomes significant if at least two close relatives had breast or ovarian cancer. The risk is higher if her family member got breast cancer before age 40. An Australian study found that having other relatives with breast cancer (in either her mother's or father's family) may also increase a woman's risk of breast cancer and other forms of cancer, including brain and lung cancers [18].
- Certain breast changes: Atypical hyperplasia and lobular carcinoma in situ found in benign breast conditions such as fibrocystic breast changes are correlated with an increased breast cancer risk.

Those with a normal body mass index at age 20 who gained weight as they aged had nearly double the risk of developing breast cancer after menopause in comparison to women who maintained their weight. The average 60-year-old woman's risk of developing breast cancer by age 65 is about 2 percent while her lifetime risk is 13 percent [19].

_____

Exercise may decrease breast cancer risk [20], also avoiding alcohol and obesity. Prophylactic bilateral mastectomy may be considered in patients with BRCA1 and BRCA2 mutations [21][22]. A 2007 report concluded that women can somewhat reduce their risk by maintaining a healthy weight, drinking less alcohol, being physically active and breastfeeding their babies [23]. Prognosis and survival rate varies greatly depending on cancer type and staging [24]. Computerized models are available to predict survival [25]. With the best treatment and dependent on staging, 10-year disease-free survival varies from 98% to 10%. Treatment includes surgery, drugs (hormonal therapy and chemotherapy), and radiation.

Worldwide, breast cancer comprises 10.4% of all cancer incidences among women, making it the most common type of non-skin cancer in women and the fifth most common cause of cancer death [26]. In 2004, breast cancer caused 519,000 deaths worldwide (7% of cancer deaths; almost 1% of all deaths) [27]. Breast cancer is about 100 times more common in women than in men, although males tend to have poorer outcomes due to delays in diagnosis [28][29][30][31].

The incidence of breast cancer varies greatly around the world being lowest in less-developed countries and greatest in the more-developed countries. In the twelve world regions, the annual age-standardized incidence rates per 100,000 women are as follows: in Eastern Asia, 18; South Central Asia, 22; sub-Saharan Africa, 22; South-Eastern Asia, 26; North Africa and Western Asia, 28; South and Central America, 42; Eastern Europe, 49; Southern Europe, 56; Northern Europe, 73; Oceania, 74; Western Europe, 78; and in North America, 90[32]. Breast cancer is strongly related to age with only 5% of all breast cancers occurring in women under 40 years old [33].

Caucasian women have overall higher risk of development of breast cancer compared to African American women, but this difference is not very apparent until the menopausal age. The breast cancer incidence in Caucasian women is about twice compared to American Asian, or Hispanic women. Breast cancer risk is very low in Native Americans.

Even though the incidence of breast cancer is lower in African American women when compared to the Caucasian population, the African American population has a higher breast cancer death rate compared to Caucasian women or in fact, compared to any other racial or ethnic population in the United States. Different biologic and genetic variation in tumours including mutations specific to African American women, the presence of risk factors, and access to health system, health behaviours and relatively later stage at the time of diagnosis of disease, may contribute to decreased survival of African American women with breast cancer.

Every woman is at some risk of developing breast cancer. There are diverse risk factors that may affect each woman's susceptibility to the disease [34]. Over one million cases of breast cancer and 411,000 deaths from breast cancer occur annually representing 14% of female cancer deaths worldwide [35][36][37][38]. The incidence rates are higher in industrialized and more affluent countries probably as a result of the availability of early cancer screening programmes that detect early invasive cancer, some of which would have progressed to the late stage of the disease [37]. As a result, the mortality rate from the disease is lower in these countries.

_____

Breast cancer mortality rates are higher in developing countries as a result of late detection and diagnosis. Several contributory factors include genetics, cultural and social factors such as poverty, unequal access to prompt high quality treatment, lack of screening facilities, or lack of awareness and knowledge of the disease. Breast cancer ranks second in cancer incidence and is still the second principal cause of cancer mortality among women worldwide including Nigeria [37][39][40].

As developing countries grow and adopt Western culture, they also accumulate more disease that has arisen from Western culture and its habits (fat/alcohol intake, smoking, low parity, exposure to oral contraceptives, the changing patterns of childbearing and breastfeeding). For instance, as South America has developed so has the amount of breast cancer. "Breast cancer in less developed countries, such as those in South America, is a major public health issue. It is a leading cause of cancer-related deaths in women in countries such as Argentina, Uruguay, and Brazil. The expected numbers of new cases and deaths due to breast cancer in South America for the year 2001 were approximately 70,000 and 30,000, respectively"[41]. However, because of a lack of funding and resources, treatment is not always available to those suffering with breast cancer.

In a recent oncological review of cases in Jos, Nigeria, over an 8-year period, breast cancer was reported to account for 56.6% of all cancer diagnosis from 1995-2002 [42]. Among Nigerian women, the peak age of breast cancer presentation is about 10-15years earlier than what is observed in Caucasian women, where it occurs between the ages of 35-45 years. Seventy percent of Nigerian women present with advanced stage of the disease and the five-year survival rate is less than 10% compared with over 70% in Western Europe and North America [40].

Breast cancers can be classified by different schemata. Every aspect influences treatment response and prognosis. Description of a breast cancer would optimally include multiple classification aspects, as well as other findings, such as signs found on physical exam.

Classification aspects include stage (TNM), pathology, grade, receptor status, and the presence or absence of genes as determined by DNA testing.

The first noticeable symptom of breast cancer is typically a lump that feels different from the rest of the breast tissue. More than 80% of breast cancer cases are discovered when the woman feels a lump [43]. The earliest breast cancers are detected by a mammogram [44]. Lumps found in lymph nodes located in the armpits [43] can also indicate breast cancer. Indications of breast cancer other than a lump may include changes in breast size or shape, skin dimpling, nipple inversion, or spontaneous single-nipple discharge. Pain ("mastodynia") is an unreliable tool in determining the presence or absence of breast cancer, but may be indicative of other breast health issues [43][44][45].

Inflammatory breast cancer is a special type of breast cancer which can pose a substantial diagnostic challenge. Symptoms may resemble a breast inflammation and may include pain, swelling, nipple inversion, warmth and redness throughout the breast, as well as an orange-peel texture to the skin referred to as *peau d'orange* [43].

_____

Another reported symptom complex of breast cancer is Paget's disease of the breast. This syndrome presents as eczematous skin changes such as redness and mild flaking of the nipple skin. As Paget's advances, symptoms may include tingling, itching, increased sensitivity, burning, and pain. There may also be discharge from the nipple. Approximately half of women diagnosed with Paget's also have a lump in the breast [46].

Most cases of breast cancer cannot be prevented through any action on the part of the affected person. The World Cancer Research Fund estimated that 38% of breast cancer cases in the US are preventable through reducing alcohol intake, increasing physical activity levels and maintaining a healthy weight [47]. It also estimated that 42% of breast cancer cases in the UK could be prevented in this way, as well as 28% in Brazil and 20% in China.

In a study of breast contributory risk and epidemiological factors published in 1995, later age at first birth and not having children accounted for 29.5% of U.S. breast cancer cases, family history of cancer accounted for 9.1% and factors correlated with higher income contributed 18.9% of cases [48]. Attempts to explain the increased incidence (but lower mortality) correlated with higher income include epidemiologic observations such as lower birth rates correlated with higher income and better education, possible over detection and over treatment because of better access to breast cancer screening, and the postulation of as yet unexplained lifestyle and dietary factors correlated with higher income. One such factor may be past hormone replacement therapy, which was typically more widespread in higher income groups.

While screening techniques are useful in determining the possibility of cancer, a further testing is necessary to confirm whether a lump detected on screening is cancer, as opposed to a benign alternative such as a simple cyst. Very often the results of noninvasive examination, mammography and additional tests that are performed in special circumstances such as ultrasound or MR imaging are sufficient to warrant excision biopsy as the definitive diagnostic and curative method.

Both mammography and clinical breast exam, also used for screening, can indicate an approximate likelihood that a lump is cancer, and may also detect some other lesions [49]. When the tests are inconclusive, Fine Needle Aspiration and Cytology (FNAC) may be used, which involves attempting to extract a small portion of fluid from the lump. Clear fluid makes the lump highly unlikely to be cancerous, but bloody fluid may be sent off for inspection under a microscope for cancerous cells. Together, these three tools can be used to diagnose breast cancer with a good degree of accuracy.

Other options for biopsy include core biopsy, where a section of the breast lump is removed, and an excision biopsy, where the entire lump is removed. In addition, vacuum-assisted breast biopsy (VAB) may help diagnose breast cancer among patients with a mammographically detected breast in women [50].

Breast cancer awareness
Before the 20th century, breast cancer was feared and discussed in hushed tones, as if it were shameful. As little could be safely done with primitive surgical techniques, women tended to suffer silently rather than seeking care. When surgery advanced, and long-term survival rates

257

_____

improved, women began raising awareness of the disease and the possibility of successful treatment. The "Women's Field Army", run by the American Society for the Control of Cancer (the forerunner of the American Cancer Society) during the 1930s and 1940s was one of the first organized campaigns. In 1952, the first peer-to-peer support group, called "Reach to Recovery", began providing post-mastectomy, in-hospital visits from women who had survived breast cancer [51].

The breast cancer movement of the 1980s and 1990s developed out of the larger feminist movements and women's health movement of the 20th century [52]. This series of political and educational campaigns, partly inspired by the politically and socially effective AIDS awareness campaigns, resulted in the widespread acceptance of second opinions before surgery, less invasive surgical procedures, support groups, and other advances in patient care [53].

Breast cancer screening
Breast cancer screening refers to testing otherwise-healthy women for breast cancer, in an attempt to achieve an earlier diagnosis. The assumption is that early detection will improve outcomes. A number of screening tests have been employed including clinical and self breast exams, mammography, genetic screening, ultrasound, and magnetic resonance imaging. A clinical or self breast exam involves feeling the breast for lumps or other abnormalities. Research evidence does not support the effectiveness of either type of breast exam, because by the time a lump is large enough to be found, it is likely to have been growing for several years and will soon be large enough to be found without an exam [54]. Mammography screening for breast cancer uses X-rays to examine the breast for any uncharacteristic masses or lumps. The Cochrane collaboration in 2009 concluded that mammograms reduce mortality from breast cancer by 15 percent but also result in unnecessary surgery and anxiety, resulting in their view that it is not clear whether mammography screening does more good or harm [55].

Many national organizations recommend regular mammography, nevertheless. For the average woman, the U.S. Preventive Services Task Force recommends mammography every two years in women between the ages of 50 and 74 [56]. The Task Force points out that in addition to unnecessary surgery and anxiety, the risks of more frequent mammograms include a small but significant increase in breast cancer induced by radiation [57]. In women at high risk, such as those with a strong family history of cancer, mammography screening is recommended at an earlier age and additional testing may include genetic screening that tests for the BRCA genes and / or magnetic resonance imaging.

The emotional impact of cancer diagnosis, symptoms, treatment, and related issues can be severe. Larger hospitals are associated with cancer support groups which provide a supportive environment to help patients cope and gain perspective from cancer survivors. Online cancer support groups are also very beneficial to cancer patients, especially in dealing with uncertainty and body-image problems inherent in cancer treatment. Not all breast cancer patients experience their illness in the same manner. Factors such as age can have a significant impact on the way a patient copes with a breast cancer diagnosis. Premenopausal women with estrogen-receptor positive breast cancer must confront the issues of early menopause induced by many of the chemotherapy regimens used to treat their breast cancer, especially those that use hormones to counteract ovarian function [58].

_____

On the other hand, a recent study conducted by researchers at the College of Public Health of the University of Georgia showed that older women may face a more difficult recovery from breast cancer than their younger counterparts [59]. As the incidence of breast cancer in women over 50 rises and survival rates increase, breast cancer is increasingly becoming a geriatric issue that warrants both further research and the expansion of specialized cancer support services tailored for specific age groups [59].

This study was intended to assess the level of awareness, perception and screening behaviour towards breast cancer among women in Ipokia, a typical rural community in south-western Nigeria, and to determine the extent to which their perception of the seriousness and susceptibility to the disease may contribute to present situation of poor health seeking behaviour. Data from this study would serve as a baseline for any intervention to be administered in the future.

METHODOLOGY

This was a cross-sectional and descriptive survey study utilizing a pretested 36-item questionnaire (Cronbach's alpha of 0.62), to collect information about specific knowledge, awareness, perception of susceptibility to breast cancer, perceived seriousness of the disease and perception of benefits of screening and screening activities of the respondents. All participants in the study voluntarily gave their consent before

being enrolled. One thousand one hundred and ninety four randomly selected women aged between 20-45 years participated in the study. The study location was Ipokia, a rural community of Ipokia local government area of Ogun state, south-west Nigeria. The pretested questionnaires constructed in both English and local Yoruba languages were administered on the participants with the help of trained research assistants.

Instrument development and measures
Some of the questions that guided the present study were, how much do the women in the rural community know about the disease, how do they perceive breast cancer in the light of morbidity and mortality and what to do for primary prevention and screening? The study sought to measure certain demographic characteristics of the participants, their level of awareness and specific knowledge regarding breast cancer, perceived susceptibility and seriousness of the disease and perceived benefits of screening and screening behaviour of the rural women in Ipokia community. Measures for the study were conceptually derived from health belief model construct [60], in which modifying factor variables such as knowledge, perception variables and screening behaviour options were incorporated in the instrument designed for the study.

Awareness and specific knowledge variables were measured on a 12-point scale where scores below 4.0 points were considered to reflect general awareness. Scores above 4 points indicated specific knowledge regarding breast cancer. The perception variables

were measured on a 4-point Likert-type scale with responses such as *Strongly Disagree, Disagree*, *Agree* and *Strongly Agree* coded so that low value on the perception domain represented little or no perceived susceptibility, seriousness of the disease and benefits of

screening. The perception items were aggregated to create a scale of measurement on a 30-point scale.

Screening behaviour measured on a maximum 11-point scale consisted items regarding screening within the last two years, the nature of the outcome of any of the screening, any intentions of a future screening, and brief description of what was required to perform the screening. Low score aggregate was assigned to little or no screening, whereas maximum score was assigned to represent recent and regular screening experience including negative screening result within the last two years. Data analysis was conducted using Statistical Package for Social Sciences [61] version 14.0. Descriptive statistics such as frequency distributions and means were used to evaluate personal characteristics, age, perception variables and screening behaviour. The significance level was set at ($p \leq 0.05$) for all statistical procedures.

RESULTS

The basic results of the study are presented here in the form of descriptive statistics and tables for demographic characteristics of the participants, specific knowledge, and level of awareness, perception domain and screening variable. Data for sub-domain of perception such as perceived susceptibility to and seriousness of breast cancer and benefits of screening were also determined and presented.

Demographic Characteristics of the Respondents
One thousand one hundred and ninety four women living in Ipokia, a rural community of Ogun state, Nigeria, participated in the study. Mean age of participants in the survey was 28.24 (Standard Error of Mean (SEM) 0.47) years. More than half of the respondents, 672(56.3%) were married, 58.1% have primary school education, 17% obtained senior secondary school certificate as their highest level of education, while 24.9% have no formal education. There were 466 (39%) Muslims, 19.7% Christians and 41.3% traditional religion worshipers among the participants.

Awareness and specific knowledge about breast cancer
Exploring the various dimensions of knowledge variables describing general awareness and specific knowledge about breast cancer among the women in this study, showed that on a 12-point scale pertaining to knowledge about the disease, the respondents recorded a mean score of 4.97 (*SE 0.15*), well below average score. The result further showed that 468(39.2%) respondents have heard about breast cancer, and 10.6% of the participants reported knowing someone that has had breast cancer before. In response to questionnaire item that required listing major symptoms associated with the disease and factors that may make a person develop breast cancer, 1.51% and 8.0% of the participants respectively were able to provide correct responses. Only 5.3% of respondents in the study reported to have received information from doctors or through radio announcements regarding cancer of the breast. Six (0.5%) of the respondents reported that they have been told by their doctors that they have breast cancer, 46.5% of them indicated some awareness of screening for cancer of the breast while majority, 1,131(94.7%) respondents have heard of gonorrhoea as a condition affecting women.

_____

Perception of breast cancer
The results from this study showed that for aggregate perception variables measured on a 30-point scale, the respondents scored a mean of 17.65 (*SE 0.18*). For perception sub-variables such as perceived susceptibility and seriousness of cervical cancer measured on

a 15-point and 12-point scales respectively, the participants in this study recorded a mean score of 8.85 (*SE 0.14*) and 6.218 (*SE 0.09*) respectively. However, perception of benefit of screening measured on a 3-point scale, recorded a mean score of 2.59 (*SE 0.03*). Some of the opinions expressed by respondents reflecting their perceptions regarding breast cancer included that not being aware of the disease will prevent them from having it,

49.2% believed that breast cancer can be transmitted sexually, while 54.5% of the respondents agreed that any woman of childbearing age can have the disease.

More than half of the respondents, 55.3%, perceived that breast cancer affects mainly the Caucasians while 57.1% admitted that all females are at risk of having the disease. For perception of seriousness, 64.6% admitted that breast cancer is a deadly disease, 33.9% believed that the disease has no cure, 57.7% said that cancer of the breast cannot make them infertile, and 35.2% believed that the disease does not kill. Perception variables positively and significantly correlated with screening behaviour ($r = 0.21$; $p<0.0001$).

Screening Behaviour
Screening behaviour variable measured on an aggregated 11-point scale recorded a mean score of 2.40 (SE 0.071). Out of twenty-four participants who claimed to have been screened within the last two years, 6(0.5%) were able to identify what procedures were carried out, while 18(1.5%) could not recall what transpired during the screening. When asked if they had any intentions of going for breast cancer screening in the nearest future, 774(64.8%) participants indicated that they would like to be screened.

Table1. Summary of descriptive statistics for major variables in this study among the women surveyed.

Variables	Maximum Point Scale	Mean score	Standard Error of Mean(SE)
Age	-	28.24	0.47
Perception of Breast Cancer*	30	17.65	0.18
▪ *Perception of Susceptibility*	15	8.85	0.14
▪ *Perception of Seriousness*	12	6.22	0.09
▪ *Perception of Benefits*	3	2.59	0.03
Screening for Breast Cancer*	11	2.40	0.07

*This variable is a composite aggregate of sub-variables of Perceived susceptibility, seriousness and benefits.

DISCUSSION

This study was undertaken to ascertain levels of awareness and specific knowledge, perceived susceptibility, perceived seriousness of breast cancer and perceived benefits of screening for early detection and treatment of women in a south-western Nigerian rural community. The study also measured screening behaviour among the participants. The health belief model (HBM), provided to a significant extent, the theoretical context for designing the instrument so that the

_____

results obtained may provide some understanding of screening behaviour and implications for health promotion intervention.

Global disease burden, as reported by World Health Organisation (WHO) [62] for 2004, seems to demonstrate that breast cancer is becoming an emerging epidemic in many countries of the world. The report also showed that the total death from all cancers/neoplasm in Nigeria was 78,700 and breast cancer recorded 10,600 (13.47%), while cervical cancer recorded 13,700 deaths (17.41%).|Unfortunately, according to WHO estimates, Nigeria has a population of 40.43 million women aged 15 years and above who are at risk of developing breast cancer. The implication of this observation is that breast cancer appears to be gaining ground and should be given more prominence than it is receiving now.

The results obtained in this study suggest that awareness and specific knowledge related to breast cancer is low. Symptom identification and possible factors most likely to cause the disease were used to test specific knowledge of the participants regarding breast cancer. It was observed that only 1.5% of the participants were able to identify specific symptoms associated with the disease. This could either mean that they are not aware of these because they do not have the condition or because they have it but are not able to link the symptoms to the condition.

Perception sub-variables measured in the study showed a consistent average level of perception of susceptibility, seriousness and benefits of screening (Table 1). The study incorporated these sub-variables from the Health Belief Model (HBM) developed by Rosenstock [60] because it directly accounts for the likelihood of individuals adopting preventive health behaviour. The core tenets of HBM show that the behaviour exhibited is determined by whether the individual believes that he/she is susceptible to a particular health problem, regards this problem as serious, and is convinced that there is benefit in undertaking treatment or preventive measures..

In exploring the extent to which perception may influence screening behaviour, data obtained in the study showed a positive correlation between perception and screening behaviour that was significant (r ⬚0.21; *P* , 0.0001). The results in this study clearly demonstrate that improved perception would produce a corresponding improvement in screening because, according to the conceptual modeling that guided the study, a high level of perceived personal susceptibility and seriousness would require only minor stimuli to trigger the recommended behaviour. Also, knowledge and certain demographic variables may serve as an important modifying factor that would awaken consciousness of the threat to life posed by breast cancer, and facilitate the role perception may play in the dynamics of influencing likelihood of seeking screening. It is hereby suggested that all females of childbearing age should be targeted for health promotion intervention, emphasizing knowledge, perception of susceptibility, seriousness and benefits in order to influence the desired health-seeking behaviour.

HBM research has been used to explore a variety of health behaviours in diverse populations. Researchers have applied the model to studies that attempt to explain and predict a variety of health behaviour responses. With the advent of HIV/AIDS, the model has been used to gain a better understanding of sexual risk behaviours [63],[64] and condom use behaviour [65],[66]. Its application in AIDS risk-reduction research among intravenous drug users has shown that HBM

_____

variables are conceptually linked to how people who exhibit high-risk behaviours perceived HIV/AIDS disease.[66,[67].

Furthermore, several studies have suggested the validity of the model in predicting compliance to condom use [66] and HIV needle risk practices among intravenous drug users. Therefore, for breast cancer screening among women, the model has value in predicting how individuals are likely to respond if an intervention is designed to stimulate screening behaviour among women, through innovative health education strategies emphasizing intensive cognitive and health promotion activities, to improve their knowledge of the disease and the benefits of screening.

CONCLUSION/RECOMMENDATIONS

Cancer of the breast has established screening methods that work. Control of breast cancer depends on increase in public awareness of the disease. Treatment should be heavily subsidised by the government and screening programme incorporated into the primary health care, as well as improving infrastructural development of health facilities. To reduce the burden, there should be constant training and re-training of personnel. A strategy to reduce the burden of disease in the community through education is also needed to be formulated. There is need to roll out a reliable screening plan to cover at least 80 per cent of the population.

In order to stimulate regular screening among women, there should be an aggressive health promotion intervention designed to increase awareness and to correct impressions about breast cancer in the community. Importantly, the outcome of such screening would guide management of conditions throughout life, including the decision-making process, in which the individual would be an important part. Interventions to promote culturally sensitive public health programmes designed to provide information and services that cut across different age groups, educational levels, cultures and social strata should be developed and implemented.

REFERENCES

[1] SH Giordano, DS Cohen, AU Buzdar, G Perkins, GN Hortobagyi. *Cancer,* **2004***,* 101 (1): 51–7.

[2] http://www.breastcancer.org/symptoms/understand_bc/risk/factors.jsp.**2008**

[3] *Lancet* , **2002,** 360 (9328): 187–95.

[4] JD Yager, NE Davidson NE, *New Engl J Med,* **2006**, 354 (3): 270–82.

[5] E Santoro, M DeSoto, and J Hong Lee.. "Hormone Therapy and Menopause". National Research Center for Women & Families**. 2009.**

[6] S Venturi. *The Breast* , **2001**, 10 (5):

[7] C Aceves. B. Anguiano, G Delgado. *Journal of mammary gland biology and neoplasia,* **2005,** 10 (2): 189–196.

[8] Fr Stoddard 2nd, AD Brooks, BA Eskin, GJ Johannes, *International journal of medical sciences,***2008,** 5 (4): 189–96.

[9] F Xue, WC Willett, BA Rosner, SE Hankinson, KB Michels. *Arch. Intern. Med.* **2011**, 171 (2): 125–33.

[10] RT Chlebowski, GL Blackburn, CA Thomson, *et al. Journal of the National Cancer Institute,* **2006,** 98 (24): 1767–76.

_____

[11] P Boffetta, M Hashibe, C La Vecchia, W Zatonski, J Rehm J. *International Journal of Cancer,* **2006**, 119 (4): 884–7.

[12] BBC report Weight link to breast cancer risk

[13] BBC report Weight link to breast cancer risk

[14] http://web.archive.org/web/20070613192148/http://www.cancer.org/downloads/STT/CAFF 2005BrFacspdf2005.pdf. Retrieved **2007**-04-26.

[15] WHO international Agency for Research on Cancer Press Release No. 180, December **2007.**

[16] SA Feig, RE Hendrick, *J Natl Cancer Inst Monogr,* **1997**, 22 (22): 119–24. PMID 9709287.

[17] http://www.stopcancerfund.org/posts/211.

[18] http://www.smh.com.au/lifestyle/wellbeing/study-finds-big-risk-of-cancer-in-the-family-20100929-15xin.html. **2010.**

[19] http://benchmarks.cancer.gov/2010/04/gain-in-body-mass-index-increases-postmenopausal-breast-cancer-risk. Retrieved **2010**-04-26.

[20] AH Eliassen, SE Hankinson, B Rosner, MD Holmes, WC Willett. *Arch. Intern. Med.,* **2010**, 170 (19): 1758–64..

[21] LC Hartmann, DJ Schaid, JE Woods et al. *N Engl J Med*, **2010,** 1999, 340:77-84.

[22] H Meijers-Heijboer, B van Geel, WL van Putten, et al. *N Engl J Med* **2001**, 345:159-164.

[23] http://www.merck.com/mmpe/print/sec18/ch253/ch253e.html.

[24] CancerMath.net Calculates survival with breast cancer based on prognostic factors and treatment. From the Laboratory for Quantitative Medicine, Massachusetts General Hospital.

[25] http://www.iarc.fr/en/Publications/PDFs-online/World-Cancer-Report/World-Cancer-Report. Retrieved 2009-03-26.

[26] http://www.who.int/mediacentre/factsheets/fs297/en/index.html. Retrieved **2009**-03-26.

[27] http://www.cancer.gov/cancertopics/pdq/treatment/malebreast/healthprofessional. .

[28] http://www.cancerhelp.org.uk/help/default.asp?page=5075. Retrieved **2007**-11-06.

[29] http://web.archive.org/web/20080107204510/http://www.cancer.org/docroot/CRI/content/CRI_2_4_1X_What_are_the_key_statistics_for_male_breast_cancer_28.asp?sitearea=..

[30] *Cancer.org*.,**2008**..

[31] BW Stewart and P Kleihues (Eds): World Cancer Report. IARCPress. Lyon 2003

[32] Breast Cancer: Breast Cancer in Young Women WebMD, **2009**

[33] http://www.breastcancer.org/cmm_who_1dx.html (s)**2006**

[34] AR Smith, M Caleffi, U Albert, TA Chen, SC Duffy, MD Franceschi & L Nystrom. *The Breast Journal* **2006**; 12(1): 16-26. (s)

[35] MD Parkin, & LMG Fernandez. *The Breast Journal* **2006**; 12(1): 70-80. (s)

[36] MD Parkin, F Bray, J Frelay, & P Pisani. *CA Cancer Journal Clinical* **2005**; 55(2): 74-108.

[37] American Cancer Society. Guidelines for breast cancer screening. Atlanta, GA: American Cancer Society **(2003).** (s)

[38] CA Adebamowo, & OO Ajayi. *West Africa Journal of Medicine* **2000**; 19(3): 179-191. (s)

[39] MN Okobia, HC Bunker, FE Okonofua, & UF Osime. *World Journal of Oncology* **2006**; 4:11

[40] novaldexlegalviewinfo/Wikipedia/BreastCancer/**2001**, p 118

[41] BM Mandong, AKJ Madaki, & AN Manasseh. *Annals of African Medicine* **2004**; 2(2): 49-53. (s)

[42] http://www.merck.com/mmhe/sec22/ch251/ch251f.html#sec22-ch251-ch251f-525, **2003**

[43] http://web.archive.org/web/20070410025934/http://www.cancer.org/downloads/STT/CAFF 2007PWSecured.pdf. 2007

_____

[44] http://www.emedicine.com/med/TOPIC3287.HTM. **2006**.

[45] http://www.cancer.gov/cancertopics/factsheet/Sites-Types/pagets-breast.2005.

[46] http://www.dietandcancerreport.org

[47] MP Madigan, RG Ziegler, J Benichou, C Byrne, RN Hoover, *Journal of the National Cancer Institute,* **1995***,* 87 (22): 1681–5.

[48] D Saslow, J Hannan,J Osuch, MH Alciati, C Baines, M Barton, JK Bobo, C Coleman, *et al*. *CA: a cancer journal for clinician,***2004***s* 54 (6): 327–44.

[49] YH Yu, C Liang, XZ Yuan. *Breast cancer research and treatment,* **2010,** 120 (2): 469–79..

[50] GA Sulik. Pink Ribbon Blues: How Breast Cancer Culture Undermines Women's Health. NY: Oxford University Press. ISBN 0199740453. OCLC 535493589, **2010.** Pages 37–38.

[51] GA Sulik. Pink Ribbon Blues: How Breast Cancer Culture Undermines Women's Health. NY: Oxford University Press. ISBN 0199740453. OCLC 535493589, **2010. 2010**. Page 4.

[52] http://www.crcfl.net/content/view/history-of-breast-cancer-advocacy.html. **2010**

[53] JP Kösters, PC Gøtzsche. *Cochrane Database Syst Rev* **, 2003**,(2): CD003373.

[54] PC Gøtzsche, M Nielsen M., *Cochrane Database Syst Re,* **2009,v** (4): CD001877.

[55] http://www.ahrq.gov/clinic/USpstf/uspsbrca.htm.

[56] http://www.ahrq.gov/clinic/3rduspstf/breastCancer/brcanrr.htm#ref31

[57] KI Pritchard. "Ovarian Suppression/Ablation in Premenopausal ER-Positive Breast Cancer Patients". *Oncology,* **2009***,* 23 (1).

[58] C Robb, WE Haley, L Balducci *et al. Critical Reviews in Oncology/hematology,* **2007***,* 62 (1): 84–91.

[59] Rosenstock IM. *Health Educ Monogr.* **1974**; 2: 328–33.

[60] SPSS Inc. Statistical Package for Social Sciences. Version 12.0. SPSS Inc: Chicago; **2003.**

[61] World Health Organization. *World Health Report* **2004:** changing history. Available at http://www.who.int/whr

[62] IM Rosenstock, V Strecher, M Becker. The Health Belief Model and HIV Risk behaviour change. In Dictemante RJ, Peterson JL, editors, *Preventing AIDS: Theories and Methods of Behavioural Interventions*. New York: Plenum Press; **1994.**

[63] SB Montgomery, JG Joseph, MH Becker et al. *AIDS Educ Prev*. **1989**;1:303–23.

[64] RW Hingson, L Strunin, BM Berlin, T Herren. *Am J Public Health*. **1990**; 80:295–9.

[65] K Ford, AE Norris. *AIDS Educ Prev*. **1995;** 7(6):494–503.

[66] J McCusker, AM Stoddard, JG Zapka et al. *Am J Public Health*. **1992**; 82:533–40.