

A Study to Improve Breast Cancer Awareness & Early Detection in Ghana

Important landmarks:

- A revelation of new nationwide statistical estimates for Breast Cancer in Ghana;
- An evaluation of the “Breastlight”, a new handheld device, an adjunct to visual inspection of breasts during breast screening and breast self-examination. Ideal for developing and depressed economies.

SECTION ONE:

AN ASSESSMENT OF THE LEVEL OF AWARENESS OF BREAST CANCER IN GHANA 1995

This project was designed to scientifically evaluate and assess the level of awareness of Breast Cancer among Ghanaian women (both literate and illiterate).

SPECIFIC OBJECTIVES

- a) To provide scientific data on the nationwide level of awareness of Breast Cancer in Ghana.
- b) To identify and assess gaps in knowledge about Breast Cancer within and between the illiterate and literate women population.
- c) To provide educational material on Breast Cancer to the public, to enhance the community awareness of the disease and thereby encourage early detection.

SUBJECTS AND METHODS

Participants for the study were selected at random from work places, churches, marketplaces, hospitals, women's organizations, family planning clinics, students' groups, etc. All women between the ages of 18 and 70 years qualified to participate in the study. A total of 431 women comprising literate and illiterate women volunteered to participate in the study. The participants were interviewed by trained interviewers. Each participant was taken through a previously tested Questionnaire. The country was divided into 3 zones namely southern zone, middle zone and northern zone to establish a basis for comparison, since most of the

awareness programs, have been organized in Accra and Kumasi which fall within the Southern and Middle Zones respectively.

The southern zone comprised of Accra, Tema, Takoradi, Prampram and Dawhenya. A total of 198 participants were interviewed; 158 literate women and 40 illiterate women. The middle zone comprised of Kumasi, Techiman, Kintampo, Juaben and Sunyani. A total of 133 participants were interviewed; 80 literate women and the remaining 53 were illiterate. Northern zone comprised of Tamale, Tatale, Salaga and Yendi. A total of 100 participants were interviewed; 23 literate women and the remaining 77 were illiterate women. All data obtained were assembled, organized and analyzed using Microsoft Excel software. For effective awareness program, education about symptoms and breast self-examination were presented to the population. The package included:

- a) The definition of Breast Cancer,
- b) The anatomical structure and function of the breast,
- c) Instructions on breast self-examination (BSE),
- d) Early detection,
- e) Symptoms, diagnosis and treatment/management,
- f) Types of Breast Cancer.

Every woman was encouraged to examine her own breast every month, and made aware that every woman's breasts are different and experience changes with age, menstruation, pregnancy, taking of birth control pills. An assessment of the amount of information and knowledge each woman selected for this study had about Breast Cancer was made by posing the following questions:

An assessment of the amount of information and knowledge each woman selected for this study had about Breast Cancer was made by posing the following questions:

1. What do you know about Breast Cancer?
2. List any changes which may be found in the breast and may also be associated with Breast Cancer.
3. Which of the treatments for Breast Cancer do you know about?

4. Do you examine your breasts, i.e. do you perform BSE?

The various responses to questions 1 and 2 were categorized or rated as "GOOD", "AVERAGE" or "POOR".

For question 1 a response was rated as "GOOD" if any of the following was given as an answer to the question:

- (i) Breast Cancer is a malignant disease which spreads to other organs and kills if not diagnosed and treated early.
- (ii) Breast Cancer usually starts as an unusual lump in the breast and can be treated successfully when discovered early.
- (iii) Breast Cancer occurs when cells in the breast become abnormal and divide out of control or order.

Responses equivalent in meaning to anyone of those listed above were rated as "GOOD".

A response was rated "AVERAGE" if any of the following was given as an answer:

- (i) Breast Cancer is a deadly disease of the breast and leads to amputation of the affected breast.
- (ii) Breast Cancer is a breast lump.
- (iii) Breast Cancer is a disease that affects the female breast.

Other responses equivalent in meaning to any of those listed above were rated as "AVERAGE".

Responses rated as "POOR" to question numbered 1 include:

- (i) Breast Cancer is caused by a boil in the breast.
- (ii) Breast Cancer is caused by excessive suckling or massaging of the breast by adult males.
- (iii) Breast Cancer occurs when one keeps money or coins in her brassier.

The principal signs and symptoms of Breast Cancer are:

- ❖ A lump or thickening in or near the breast or in the underarm area; A change in the size or shape of the breast;
- ❖ A discharge from the nipple; or

- ❖ A change in the color or feel of the skin of the breast, areola, or nipple (dimpled, puckered, or scaly).

For question 2 a response that included any 2 or more of the symptoms listed were rated “GOOD”, 1 symptom was rated “AVERAGE” whereas ones inability to list any symptoms was rated “POOR”.

RESULTS AND DISCUSSION

- The average age at first menstrual period for Ghanaian women was 14.91 years and the mode was 15 years. It was estimated that 88.19% of the females had their menarche at age 16 or below. Early menarche is known to increase risk for Breast Cancer **(7)**. Pike reported that Polish girls who started menstruating before the age of 16 carried a 1.8 times increase in risk for Breast Cancer compared with those whose menarche was later than 16 **(8)**.
- The average age at menopause calculated from our data was 47.77 years, 44.29% of the post-menopausal women had their menopause at the ages 47.77 years or below, whereas 2.86% of them had their menopause 55 years or above. Late menopause is known to increase risk for Breast Cancer **(7)**. Trichopoulos et al reported a doubling of risk for women who continued menstruating beyond the age of 55 compared with those whose natural menopause was before 45 years. This is attributed to the fact that breast tissues exposed to hormones for a longer period have an increased risk for Breast Cancer **(9, 10, 11)**.
- In this survey we observed that 93.02% of Ghanaian women have breast-fed their children, while 6.98% did not. 2.78% breast-fed their children for three to six months, 15.97% breast-fed for seven months to one year and 81.25% breast-fed for more than one year (13-36 months). There is some evidence that breast-feeding protects women from Breast Cancer, this benefit is seen in post-menopausal women who breast-fed any of their babies for a year or more during their pre-menopausal ages **(11)**. The present study indicates a large majority of Ghanaian women population unknowingly enjoy the protection breast -feeding offers from Breast Cancer.

- For the study population 21.84% of all the literate women gave responses to question 1 that were rated "GOOD" ; 33.33% gave responses rated "AVERAGE" whereas 44.83% of the responses were rated "POOR". 55.17% of literate Ghanaian women could be said to have some information about Breast Cancer while 44.83% do not.
- For illiterate Ghanaian women less than 1 % of the study population gave responses to question 1 rated as "GOOD", 4.12% gave responses rated "AVERAGE" whereas 95.88% of the responses were rated "POOR". This implies that only 4.12% of illiterate Ghanaian women had some information about Breast Cancer while 95.88% did not.
- Responses from literate women to question 2; 10.34% of literate women provided responses which were rated "GOOD", 26.44% of the responses were rated "AVERAGE" while 63.22% were rated "POOR". It can be inferred that 36.78% (10.34+26.44%) of literate women had some knowledge about symptoms of Breast Cancer while 63.22% had none.
- Responses from illiterate Ghanaian women to question 2, revealed the following. Responses rated "GOOD" were provided by 0.59% of illiterate women, 5.88% provided responses rated "AVERAGE" while 93.55% provided responses rated "POOR". It can be inferred that 6.47% (0.59+5.88%) of illiterate women had some knowledge about the symptoms of Breast Cancer while 93.55% do not.

Breast Cancer is treatable and indeed curable. Treatment options open to the patient and his doctor depends on the stage of the disease on presentation. Methods of treatment for Breast Cancer are local or systemic. Surgery and radiation therapy are local treatments while chemotherapy and hormonal therapy are systemic treatments.

- Among literate women surgery was the most widely known -57.62% followed by chemotherapy -13.41%, hormonal therapy and herbal treatments were known to 5.79% and 5.18% of the literate women respectively. 18.00% of these women had no idea of any of the treatment options.
- With respect to methods of treatment for Breast Cancer, among illiterate Ghanaian women surgery was the most widely known -25.29% followed by herbal treatment - 10%, chemotherapy -4.12% and finally hormone therapy -1.18% of this study

population. The remaining 59.41% of this study population had no idea of any of these treatment options. It is evident that literate women are better informed about conventional treatments than their illiterate counterparts, while the illiterate women are more likely to know about alternative treatment i.e. herbal treatment. This is attributable to the fact that a large proportion of illiterate women reside in rural areas where health facilities are thinly distributed. Most of them resort to traditional herbal healing remedies for all their medical needs.

- 36.78% of the literate women were aware of at least one symptom of Breast Cancer and 63.22% were not. 69.74% of them examined their breasts while 30.26% of them did not. Chi-square (X^2) analysis of responses to question 1 indicated that the geographical zone in which a literate Ghanaian woman resides has significant influence on the amount of information she has about Breast Cancer - H_0 . $X^2=9.026$, the critical value (X^2_c) = 9.448: df = 4: $p < 0.05$ when a two-sided X^2 test was performed.
- 6.48% of the illiterate women were aware of at least one symptom of Breast Cancer. 93.53% was not. 20.58% of them examined their breasts while 79.42% of them did not. Chi-square analysis of responses to question 1 indicated that the geographical zone in which an illiterate Ghanaian woman resides has significant influence on the amount of information she has about Breast Cancer - H_A . $X^2=1.509$, the critical value $X^2_c = 3.841$: df = 1: $p < 0.05$ when a two-sided X^2 test was performed. This indicates that there is no significant difference in the amount of information about Breast Cancer between illiterate women from different geographical zones.
- Chi-Square (X^2) analysis of responses to question 2 indicated that; the geographical zone in which a literate Ghanaian woman resides significantly influences her knowledge about symptoms of Breast Cancer - H_A . $X^2= 8.507$: df = 2, $P < 0.05$; $X^2_c = 5.991$.
- X^2 analysis of responses to question 2 indicated that the geographical zone in which an illiterate Ghanaian woman resides significantly influenced her knowledge about symptoms of Breast Cancer - H^A . $X^2= 8.163$, df = 1, $P < 0.05$, $X^2_c = 3.841$.
- Responses to question 1 were analyzed under these two groups of women, namely illiterate and literate and the Chi-square analysis indicated that, the amount of

information a Ghanaian woman has about Breast Cancer is significantly influenced by her literacy status - H_A . The X^2 test yielded a value of 117.904; $df = 1$; $P < 0.05$; $X^2_c = 6.635$ when a two-sided X^2 test was performed.

- Knowledge about symptoms of Breast Cancer among Ghanaian women is significantly influenced by their literacy status. $X^2 = 51.395$; $df = 2$; $P < 0.05$, $X^2_c = 5.991$ when a two-sided X^2 is performed. Thus, revealing a statistically significant difference in knowledge about symptoms of Breast Cancer between literate and illiterate Ghanaian women.
- 24.83% of all participants in this study were aware of at least one symptom of Breast Cancer whereas 75.17% of them were not aware of any symptom of Breast Cancer. Among literate women there are significant differences in awareness of symptoms as one moves from one geographical zone to the other. Those in the southern zone were in the lead, followed by the middle zone and finally the northern zone.

CONCLUSION

Performing BSE presupposes that the performer is aware of changes in the breast she wants to pick up if there are any - and report to her doctor. In our survey we observed that; 24.83% of all the participants selected were aware of at least one symptom of Breast Cancer whereas 75.17% of them are not. 50.35% of the women examine their breasts and 49.65% do not. It can be deduced that 25.52% (i.e. 50.35% - 24.83%) of the women who examine their breasts do not know what change to look for although they do BSE (assumption; all women aware of at least one symptom of Breast Cancer do BSE). 49.65% of the women do not examine their breasts and 25.52% of the women who do BSE do not know about any symptoms of Breast Cancer. Similarly by deduction 75.17% (49.65% + 25.52%) are not aware of any symptom for Breast Cancer; this figure equals what was actually observed through data collection. This proves our assumption that all women who are aware of at least one symptom of Breast Cancer do BSE. In reality women who are aware of at least one symptom of Breast Cancer are more likely to examine their breasts. Those who are not aware of any symptoms will normally not perform BSE. For BSE women from the southern zone are more likely to examine their breasts, followed by those from the middle zone and finally the northern zone. This trend is observed among literate and illiterate women. Among the literate women those from the southern zone were the most informed followed by those from the middle zone and finally those from the northern zone. The same trend was observed for the illiterate women. One can deduce with some degree of confidence that this pattern observed so far is a reflection of the fact that most awareness programs and functions for Breast Cancer have been implemented in Accra which falls within the southern zone of our set boundaries for this survey. In addition these programs have not made the expected impact on the target group yet. Although the overall awareness in the entire women population is not impressive and rather low the illiterate women populations are clearly far below, compared with their literate counterparts who are in turn, below, expectation.

- Awareness for Breast Cancer in Ghana is still very low among the target population. There are significant knowledge gaps between literate and illiterate women groups as well as within literate women groups and the illiterate women groups studied.

- For both literate and illiterate women, those within the southern zone were ahead in terms of knowledge about Breast Cancer, followed by middle zone and finally the northern zone. The knowledge gap between literate and illiterate women is extremely wide.

RECOMMENDATIONS

- A special awareness package should be developed with Ghanaian women in mind.
- A breast disease awareness service/center should be set up to organize and coordinate awareness programs in a more organized and consistent manner.
- A national body/association for Breast Cancer patients and their relative be organized.
- A Breast Cancer awareness week should be celebrated every year probably in August to coincide with world breast feeding day i.e. 1st August.

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REFERENCES

1. Archempong EQ. Breast Cancer in Ghana, National Cancer Foundation. Dec. 1990.
2. Oxford Textbook of Pathology. Vol2a, Oxford University Press, New York.1992:1643-81.
3. Quartey-Papafio JB. Breast Cancer in Accra, Ghana Medical J. 1977: 16; 189-191.
4. Quartey-Papfio JB and Anim IT. Cancer of the Breast in Accra, Ghana Medical J.Sept. 1980: 159-161.
5. Wiredu WK. Personal Communication, Department of Pathology, Ghana MedicalSchool. Oct. 1995.
6. Darko R. Personal Communication, Department of Surgery, Ghana Medical School.Oct. 1995.
7. MacMahon B, Cole P, Brown J. Etiology of human Breast Cancer: A review. J Natl Cancer Inst. 1973: 51; 1479.
8. Pike MC, Krailo MD, Henderson RE et al. Hormonal risk factors, breast tissue age and age at incidence of Breast Cancer. Nature.1983: 303; 767-70.
9. Trichopoulos D, MacMahon B, Cole P. The menopause and Breast Cancer, J Natl Cancer Inst.1972: 48; 605-13.
10. MacMahon B, Feinleib M. Breast Cancer in relation to nursing and menopausal history. J Natl Cancer Inst.1960: 24; 733-53.
11. Feinleib M. Breast Cancer and artificial menopause: a cohort study. J Natl Cancer Inst. 1968: 41; 315-29.
12. McTiernan A, Thomas DB. Evidence for a protective effect of lactation on risk of Breast Cancer in young women. Am J Epidemiol. 1986:124; 353-8.

SECTION TWO:

A NATIONWIDE AWARENESS AND SCREENING FOR BREAST CANCER 1999 - 2008

This follow up project was designed to study the basic epidemiology of breast lesions in Ghana. Over 47,000 women from all 10 regions of Ghana were screened for breast lesions and educated on breast awareness.

AIMS AND OBJECTIVES:

1. To Study The Descriptive Epidemiology And Patho – Biochemical nature Of Breast Cancer Relevant To Its Treatment In Ghana
2. To Help Improve Breast Cancer Awareness And Early Detection in Ghana
3. To Estimate The Prevalence Of Breast Cancer In Ghana

CONCLUSIONS

- 54.84% of Breast Cancer patients in Ghana are pre / peri - menopausal 45.16% are of post-menopausal status (F.N. GHARTEY et al, 2008.).
- Ghanaian women (black Africans) develop Breast Cancer some 10 to 15 years earlier than Caucasians (Whites).
- Average Age at detection of Breast Cancer in Ghana = 42.59 years
- In Ghana, the most affected Age group for Breast Cancer is 35 years to 45 years,
- Most affected Age for Breast Cancer = 35 years.
- Prevalence rate for Breast Cancer in Ghana ranges from 0.41% - 1.11% (95%confidence interval) among females aged 15 to 80 years in Ghana (black Africans);
- Prevalence of benign breast lumps ranges from 0.69% - 6.89% (95 % confidence interval).
- The average age of Breast Cancer patients detected through screening in Ghana is 42.59 years; compared to the average age for Breast Cancer patients reporting for surgical treatment at a major referral Centre in Accra being 51.2 years. This is evidence for late/delayed presentation for treatment.

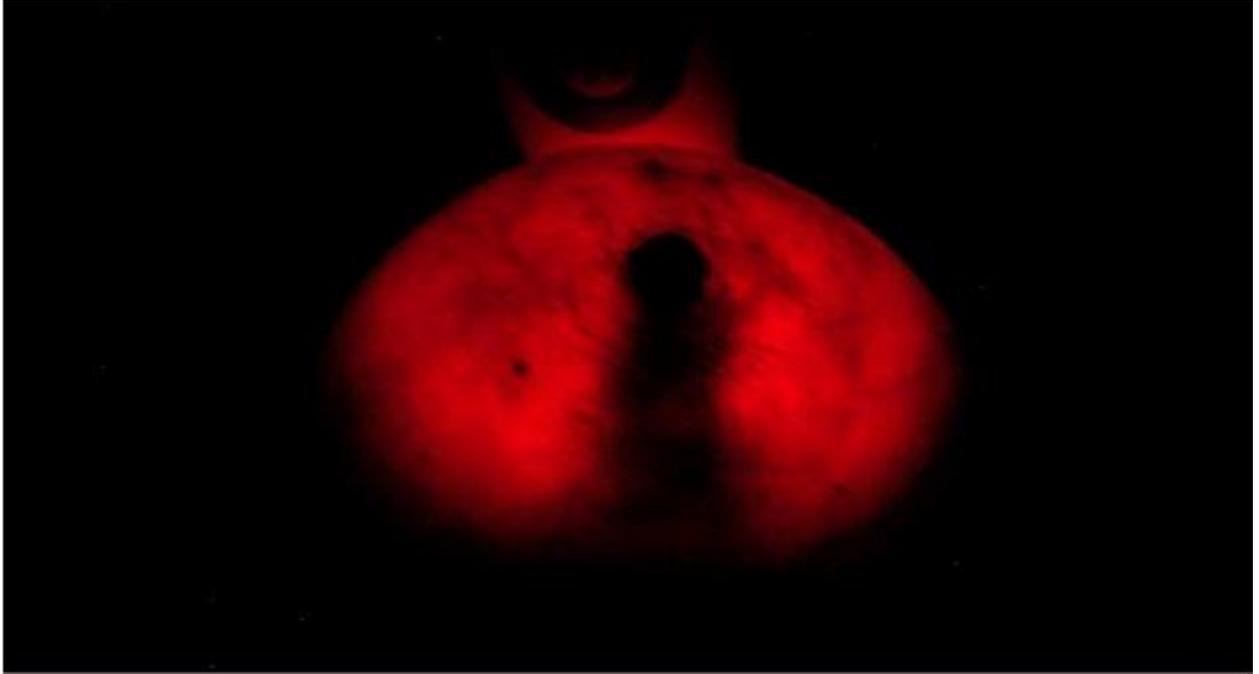
AN EVALUATION OF A NEW HANDHELD DEVICE; THE BREASTLIGHT:



INVENTED BY DR D.J. WATMOUGH, CEO, HIGHLAND INNOVATION CENTRE, INVERNESS, SCOTLAND.

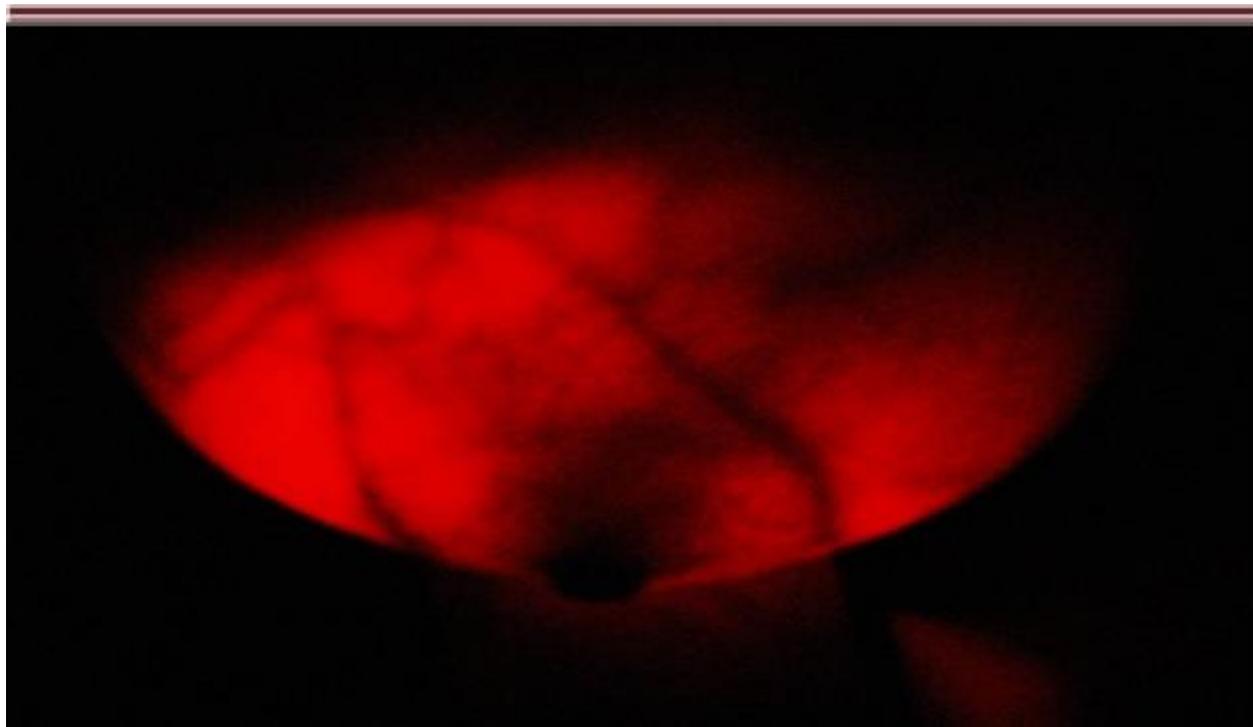
Breastlight is a handheld device that trans-illuminates the breast with a red light (617nm) that is absorbed by hemoglobin so that areas of high vascularity (such as malignant tumors) should appear black.

BLOODY NIPPLE DISCHARGE REVEALED BY BREASTLIGHT; AFFECTED DUCTS REVEALED



HISTOLOGICALLY CONFIRMED MALIGNANT BREAST MASS REVEALED WITH BREASTLIGHT

**HISTOLOGICALLY CONFIRMED DIFFUSE MALIGNANT BREAST LESION, DETECTED WITH
BREASTLIGHT**



AN EVALUATION OF THE NEW BREASTLIGHT FROM JULY 2007 TO DECEMBER 2008

No. of well women examined by clinical examination.	5,048	Additional comments.
No found to have a lump or other symptoms	424	
No followed up by mammography	42	High default rate by patients
No followed up by FNAC	29	High default rate by patients
No with confirmed Breast Cancer	42	
No with benign breast disease.	362	
No of benign breast lesions 'missed' by Breastlight.	17	$17/60 \times 100 = 28.33\%$
No of benign breast lesions positive with Breastlight	43	$43/60 \times 100 = 71.66\%$
No of malignant breast lesions missed by Breastlight.	1	$1/42 \times 100 = 2.38 \%$
No of malignant breast lesions, positive with breastlight.	41	$41/42 \times 100 = 97.62\%$
No of malignant breast lesions where woman herself saw abnormal image with Breastlight.	41	100.00%

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