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# **The impact of breast cancer awareness interventions on breast screening uptake among women in the UK: A systematic review.**

## **Abstract**

*Background:* The impact of breast screening awareness campaigns on mammography attendance among British women was explored. *Methods:* BNI, MEDLINE, PsycINFO EMBASE, and CINAHL were searched between October 2012-February 2013. Searches identified research on breast cancer awareness interventions and breast self-examination. *Results:* 867 articles were identified and 14 met criteria for review. Breast cancer awareness interventions were found to increase the uptake of breast self-examination behaviours and increase the likelihood of breast cancer screening attendance. *Conclusions:* Predicting the impact of these interventions on survivability and general morbidity/mortality outcomes remains a challenge due to a shortage of suitably evaluated campaigns.

## **Introduction**

Breast cancer is the most common cancer in the UK (Office of National Statistics; ONS, 2014) and the second most common cause of cancer death in women, after lung cancer (ONS, 2014). It is one of three cancers including cervical and bowel cancer that have national screening programmes. Attending regular mammography screenings can potentially increase early detection to improve treatment outcomes (International Agency for Research on Cancer, IARC, 2017). As reported by the advisory committee on National Health Service Breast Screening Programme (NHSBSP, 2006 2011) regular mammography attendance is suggested to reduce breast cancer mortality rate by up to 35%.

Although national mammography screening programmes are among the most effective ways of detecting breast cancer (Feig, 1988), the majority of breast cancers are detected by women through Breast Self-Examination (BSE; Greenwald, 2001). According to Greenwald (2001), once women are breast-aware with regards to knowing what their breasts look and feel like through regular BSE, they can be

just as, if not more, effective at detecting abnormalities when compared to mammogram screening. Regular BSE has been suggested to help in detecting cancer at an early stage, thus improving prognoses (Harmer, 2011). It has also been suggested that theoretical educational programmes including literature can be effective in increasing BSE uptake (Budakoglu, Maral, Ozdemir, & Bumin, 2007; Yi & Park, 2012). Avci and Gozum (2009) found that educational programmes that create breast cancer awareness have been effective in increasing health promoting behaviours such as BSE and that following being exposed to an educational video, women's susceptibility, perceived self-efficacy of BSE, and perceived benefits of mammography increased.

In the absence of a cure for breast cancer, early detection is fundamental in helping to reduce breast cancer mortality. Therefore, public health organisations provide health promotion and breast cancer awareness interventions to encourage early detection. According to the HM Government (2010), the purpose of a public health intervention is to encourage mass health behaviour change through addressing specific health behaviours. This may include a mass media campaign and/or educational literature and healthcare professional and/or patients' centre educational programmes. Studies have shown that public health campaigns can be extremely effective at initiating health behaviour change, especially media campaigns for breast cancer awareness (Wakefield, Loken, and Hornik, 2010).

The objective of this review was therefore to examine the impact of breast cancer awareness campaigns on breast cancer awareness, BSE and attendance at screening programmes. This systematic review included public health campaigns, educational programmes and interventions that promoted breast cancer awareness. We reviewed this content in order to gain a deeper understanding of the link between breast awareness, breast self-examination awareness and screening uptake. This review aimed to measure breast cancer screening and breast cancer awareness uptake among British women, following educational public awareness campaigns and interventions. It included all evaluated breast cancer public information campaigns

(including written literature, i.e., leaflets/booklets). In addition, unlike Wakefield et al. (2010), this review also took into account non-mass media campaigns and interventions such as those which targeted clinicians as well as patients.

Furthermore, this review included quantitative and process evaluations of public health interventions. The key objective was to identify and review evaluated breast cancer awareness campaigns and interventions that took place post-1988 to date, and evaluate their effectiveness. The year 1988 was chosen as a starting point as it was the year in which mammograms were first introduced to women aged 50-64 years (NHSBSP, 2006). The following questions were considered:

- Do breast cancer awareness campaigns affect breast screening uptake in British women of qualifying age?
- What factors make breast cancer awareness campaigns effective/ineffective at increasing the number of women who attend mammograms and/or perform regular BSE?
- What further recommendations can be obtained from previous literature when considering the development of future breast awareness campaigns and routine health promoting behaviours?

The evidence from this review will potentially contribute to:

- Facilitate the implementation of best practice in future public health breast cancer awareness interventions.
- Provide the best available information to enhance future breast screening uptake.
- Identify and systematically appraise the most relevant available evidence relating to public health breast screening awareness campaigns.
- Critically appraise relevant existing breast screening awareness campaigns identified post-1988.
- Make recommendations derived from best available evidence for future breast screening and breast health awareness interventions/campaigns.
- Highlight areas where further research may be required.

## **Method**

An exhaustive search and review of the academic, peer-reviewed literature was conducted using BNI, CINHALL, EMDASE, Medline and Psychinfo databases. When searching for relevant literature via the use of NHS evidence and University MetCat databases the following parameters were implemented: Published between January 1988 and February 2013, in English; human research only; peer reviewed; all age groups; female sex; search term “breast cancer awareness”; key word in title and abstract. This search term was chosen as being breast cancer aware has been suggested to encompass a range of breast health-related behaviours including screening uptake (Secginli & Nahcivan, 2006).

### ***BNI Search Strategy***

The BNI search was performed in 3 stages and was last run on the 18/12/2012.

- I. Title and abstract search using the thesaurus function for the term “Breast Cancer”. The subcategories selected were: “Breast Cancer”, OR “Breast Cancer : Prevention and Screening”. This produced 2,598 results.
- II. Second search: title and abstract search using the thesaurus function for the term “health promotion”: The subcategories selected were: “Health Promotion”, OR “Screening”, OR “Patients : Education”, OR “Public Health Nursing”, OR “Health Attitudes”, OR “Health Psychology”. This produced 13,123 results.
- III. Combination of results: “Breast Cancer”, OR “Breast Cancer: Prevention and Screening”; AND “Health Promotion”, OR “Screening”, OR “Patients: Education”, OR “Public Health Nursing”, OR “Health Attitudes”, OR “Health Psychology”. This resulted in 459 published articles.

### ***PSYCHINFO search strategy***

This was also performed in 3 stages and last run on the 18/12/2012. The following search terms were used for title and abstract: “breast”, AND “cancer”, AND “awareness”. This was limited to: human research; the age groups Adulthood (age 18 years and older), Young Adulthood (age 18 to 29 years), Thirties (age 30 to 39

years), Middle Age (age 40 to 64 years), or Aged (age 65 years and older); English language; and publication year between 1988 and 2012. This resulted in 200 published articles.

### ***MEDLINE search strategy***

This search was also performed in 3 stages and was last run on the 18/12/2012. The following search term was used for title and abstract: “breast”, AND “cancer”, AND “awareness”, AND “intervention”. This was limited to: English language; females; human research; the age groups All Adult (age 19 years and older), Young Adult (age 19 to 24 years), Adult (age 19 to 44 years), Middle Age (ages 45 to 64 years), Middle Aged (age 45 years and older), or All Aged (age 65 years and older); and publication year between 1988 and the current date. This resulted in 60 published articles.

### ***CINHAL, EMDASE search strategy***

The following additional searches were carried out using broader search terms as well as additional databases. This resulted in a further 149 articles being found.

- I. Search results for ("breast cancer awareness").ti,ab,af [Limit to: Publication Year 1988-2013 and (Language English) and (Gender Female)]" in CINAHL.
- II. Search results for ("breast cancer awareness" AND promotion).ti,ab,af [Limit to: Human and English Language and Publication Year 1988-Current]" in PsycINFO.
- III. Search results for ("breast cancer awareness INTERVENTION" OR "breast cancer awareness CAMPAIGN" OR "breast cancer awareness PROMOTION").ti,ab,af [Limit to: Human and Female and English Language and (Languages English) and Publication Year 1988-Current]" in EMBAS.
- IV. Search results for ("breast cancer awareness INTERVENTION" OR "breast cancer awareness CAMPAIGN" OR "breast cancer awareness PROMOTION").ti,ab [Limit to: Female and Humans and Publication Year 1988-Current and (Languages English)]" in MEDLINE.
- V. Search results for ("breast cancer awareness INTERVENTION" OR "breast cancer awareness CAMPAIGN" OR "breast cancer awareness 1988-Current]" in BNI.

- VI. Additional search using MetCat software: London Metropolitan University; date 10/02/13. Using advance search. Search term” “breast cancer awareness INTERVENTION” OR "breast cancer awareness CAMPAIGN” OR "breast cancer awareness PROMOTION” Peer reviewed articles only, English language date range 1988-2013.

### ***Inclusion and exclusion criteria***

The literature included that which had been peer-reviewed and carried out between January 1988 up until the date of the search (February 2013). Evaluated breast cancer awareness interventions were included, and campaigns as opposed to prevention, diagnoses, treatments or prognoses. Studies that included pre-measurement of existing awareness/knowledge in the absence of an intervention were not included. Literature selected included female-only participant samples as it is only females who are currently invited to the national NHS breast screening programme due to their increased susceptibility to breast cancer (NHSBSP, 2006). Research that did not directly evaluate public health campaigns and interventions promoting breast cancer awareness and/or screening programmes were not included in this review. Excluded research included reviews of mammogram screening; effectiveness with regards to technical processes involved in screening, as well as screening staff training and attitudes for biogenetic markers; risk factors or health benefits around breast cancer prevention. In addition, developmental research relating to breast cancer causes and treatments, and literature relating to post-diagnoses interventions and coping behaviour were not included. Expert opinions, editorial reviews, case reports and anecdotal methodology research papers were excluded. Figure 1 shows the research selection process depicting how the resulting 14 studies were identified.

\*insert figure 1 about here

Studies were categorised using the ScHARR Hierarchy system (Greenhalgh, 1997), shown in Table 1. The ScHARR method was used as it enabled the inclusion and

evolution of various types of methodologies whilst prioritising methods that showed greater empirical evidence.

## **Results**

The 14 evaluated breast cancer awareness intervention studies included in this review are summarised in Tables 1a and 1b. There were five studies reporting on interventions that specifically targeted breast screening uptake (see Table 1a. for a summary), and nine studies that reported on interventions aimed only at PEP (summarised in Table 1b.). Included studies encompassed one community-based intervention using promotional material, nine studies comprising clinical engagement (GP's mammographies and radiographies), four studies with tailored specific interventions (older women, cancer survivors, teenagers and those with learning difficulties). With regards to study methodology, five of the studies used a randomised control design, one study used a case control exploratory design and seven studies included cohort designs consisting of cross-sectional studies investigating specific population groups.

Insert Tables about here

## **Discussion**

This review summarises what has been done to address the issues around symptomatic presentation and breast screening uptake. The objective was to collate and review research carried out between 1988 to the present date with regards to increasing breast cancer awareness and screening uptake via public health campaigns and educational interventions conducted in the UK. The review showed that, to an extent, all methods of intervention are effective at raising breast cancer awareness and promoting BSE and breast cancer screening uptake. These methods include written resources, promotional material such as posters and beer mats placed within community settings, group and one-on-one interventions, workshops and healthcare professional involvement (with varying degrees sample sizes) from GPs to radiographers. Interventions settings have also been varied, from school-

based, GP-based and screening-based. Some of the interventions that were identified as being successful, were tailored to suit specific population groups including teenagers and those with special needs. These interventions focused on key messages, for example, being aware of what is 'normal' and attending screening as opposed to regular self-examination. Similarly, Scanlon (2005) suggested that there are existing inequalities in breast screening uptake in women from ethnic minorities. Therefore women from ethnic minorities may also require specific targeted and tailored interventions (Bollinger & Kreuter, 2012).

Community-based and participatory approaches including both patients and healthcare professionals seem to show promise at increasing breast cancer awareness, as do participatory education principles of empowerment that activate women in becoming more aware of their breast health, understanding, and using information for their own health. According to Kusters and Gotzche (2008), some health professionals still recommend BSE, contrary to the evidence that, alone, it can be harmful and should be replaced with the promotion of breast awareness (Mant, 1991). Findings pointed towards the importance of interventions aimed at healthcare professionals when reviewing the effectiveness of public health interventions as they play a pivotal role in increasing early detection. These findings highlight that interventions including both patient and healthcare professionals are effective and this should be considered when developing and evaluating such interventions. Furthermore, few rigorous evaluations of breast cancer awareness interventions are available and most have been conducted outside of the UK. Evaluations that have been carried out are not definitive in predicting the longevity of the impact of public health interventions and interventions delivered to communities may promote cancer awareness and early presentation; despite evidence being somewhat limited.

The majority of the studies identified in this review involved clinical engagement and training. These studies showed that effective clinical training can result in increased patient conformity to screening and increased awareness. Although not

all studies were statistically appraised, the impact of those that were, showed significant positive results in increased likelihood of early presentation. The most effective involved training mammographers to deliver brief breast awareness interventions to patients who attend for screening (Forbes et al., 2012). It is however important to note that this study involving mammographers was delivered to women who were already attending breast screening and therefore did not address the pre-screening decision-making processes. Although clinical training interventions were deemed to be effective for both long term and short term increased knowledge and likelihood of early presentation, they were not carried out on a large scale. The majority of identified studies were pilot trials and therefore would require replication. Training healthcare professionals can also be time-consuming and requires positive long-term clinical engagement.

Population-specific interventions included in this review included adolescents, people with learning disabilities, those with a previous cancer diagnoses (and increased risk of breast cancer), and older women. Addressing the individual needs of specific populations may have a strong positive impact on the effectiveness of a breast cancer awareness intervention. In addition, as previously observed by Wakefield et al. (2010), non-evaluated mass media campaigns were identified. However there are some that warrant a mention, such as the TLC (“Touch, Look, Feel”) message, promoted by the Department of Health in mass written educational literature to encourage primary healthcare professionals to discuss breast cancer awareness and self-examinations with patients (Cant, 2008). There has been no direct evaluation of this mass media educational literature, so it was therefore excluded from this review. However, it does reinforce the need for the evaluation of mass public health interventions.

This review also reinforced the effectiveness of promotional literature at increasing breast cancer knowledge when placed within a community setting (Poynor, 2003). This supports Chouliara, Power, and Swanson (2002), who found that mammography screening attendees were more likely have a pre-existing knowledge

of breast cancer and its signs and symptoms. Therefore, education literature could potentially increase knowledge, thus increasing the likelihood of future breast screening attendance.

In conclusion, this review found that breast cancer awareness interventions are effective at increasing breast cancer awareness, knowledge and screening uptake, and could contribute to reducing late diagnoses, thus potentially reducing breast cancer mortality rates. Small community educational programmes, although sparse, can be effective; as can be mass community promotional campaigns and clinical training interventions. However, in contrast, and as concluded by Austoker et al. (2009), there is likely to be an abundance of local interventions that have not been included because they have not been evaluated or peer reviewed. For further information on what makes an effective breast cancer awareness intervention, it is important that all research is reported and evaluated. This review goes some way to determine what makes an effective breast cancer intervention; however, due to the lack of available evaluated studies, it is difficult to determine how many interventions are unaccounted for and how effective breast cancer awareness campaigns have been.

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