

ORIGINAL PAPER

Effectiveness of a Brief Health Education Intervention for Breast Cancer Prevention in Greece Under Economic Crisis

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Abstract

Background: Prevalence rates in breast cancer have now reached epidemic levels. One of the main reasons behind onset of breast cancer is poor preventive beliefs and behavior of women towards cancer prevention. We examined the effectiveness of health education intervention in two communities of South Greece.

Objective: The study investigates the effectiveness of a brief health education intervention on women's beliefs and behaviour changes concerning breast cancer prevention.

Methodology: A 90-minute, one-off encounter, health education study was designed for 300 women from Peloponissos, South Greece. A Health Belief Model questionnaire, was used before the intervention, immediately after and 6-months after the intervention.

Results: Despite certain perception-related barriers (embarrassment, anxiety, ect) women's overall beliefs towards breast cancer prevention (perceived susceptibility, perceived benefits and perceived barriers) changed positively after the health education intervention and this change was sustained at 6-month follow up. However, specific barriers (embarrassment, fear of pain, anxiety when anticipating tests' results) were not maintained at the same level of post-intervention during the same follow up. During the follow up period, women performed breast self-examination every month (73%) and 55.10% had breast examination by a clinician and underwent a mammography.

Conclusions: Short, low cost, health education interventions for breast cancer prevention to women can be effective in changing beliefs and behaviour. Tailored interventions are necessary to overcome relapsing of specific barriers. Emphasis should be given on the importance of doctor/nurse role in breast screening.

Key-Words: breast cancer, clinical breast examination, mammography, beliefs, behaviour

Introduction

Breast cancer is the most frequent cancer among women. In 2008, worldwide, 1.38 million new cases were diagnosed (23% of all cancers). The same year in Europe, 425,147 women developed breast cancer and 128,737 women died from the disease (Globocan, 2011). In Greece, a country with a population of 10.5 million people, 4,349 new cases of breast cancer and 1,927 deaths were recorded in 2008 (Globocan, 2011).

Breast cancer is now the most common cancer both in developed and developing regions with approximately 690,000 new cases estimated in each continent (population ratio 1:4) (Globocan, 2011). Incidence rates vary from 19.3 per 100,000 women in Eastern Africa to 89.7 per 100,000 women in Western Europe, and are higher in developed regions of the world (greater than 80 per 100,000) (except Japan) and lower in most of the developing regions (less than 40 per 100,000) (Globocan, 2011).

Despite the developments in preventive medicine the incidence of breast cancer has been increasing worldwide but breast cancer, in most cases, if diagnosed early, is curable and with minor effects on the quality of life. The advanced imaging techniques (U/S, MRI and Digital Mammography) have high accuracy and in combination with regular clinical examination can help to diagnose the disease at an early stage. An important step in this process is the women's motivation to protect themselves from breast cancer. An important instrument for motivation is the Health Promotion programs which focus on health education. However, effective health education programs have to be theoretic and evidence-based. The Health Belief Model (HBM) is an applicable model for planning interventions aiming in behaviour changes [Simon & Das, 1984, Yarbrough & Braden, 2001, Abood et al, 2003, Norman & Brain, 2005]. According to the HBM, health behaviour is the result of a series of people's core beliefs concerning perceived personal

susceptibility, severity of the disease, benefits of the new behaviour and barriers for applying the healthy behaviour (Janz & Becker, 1984, Ogden 2000, Koelen & Van Den Ban, 2004).

According to the literature, the main barriers for women to avoid preventive examinations are: a) beliefs and attitudes, b) their social network experience and c) accessibility of services (Ogedegbe et al, 2005). The percentage of Greek population receiving screening services is low and it is seriously affected by social factors (Dimitrakaki et al, 2009). An additional barrier in accessing screening services is the economic crisis that has severely affected the country. Therefore the health professionals can not develop high cost and long – lasting prevention interventions.

Research Questions And Hypothesis

In the intervention study our main hypothesis was whether a brief health education intervention maybe effective in changing women's beliefs and behaviour with regards to breast cancer preventive tests.

The research questions of the intervention study were: Does the intervention:

- Increase levels in perceived susceptibility to breast cancer?
- Increase levels of perceived benefits of breast self-examination, clinician examination and mammography?
- Decrease levels of perceived barriers to mammography and breast examination by a clinician?
- Increase self-efficacy to breast self-examination?
- Increase rates in undergoing mammography and clinical breast examination?

Methodology

Design and Sample

The intervention research participants were 300 women, who belonged to the local women associations of two prefectures south of Athens, Lakonia and Arcadia. Two

hundred and seventy women fulfilled all the steps of the research (during the follow up 30 women could not be found). We decided to select the participants from an already existing local social network, because all demographic characteristics of the area were represented in the local women's associations. The only condition for women in order to participate to the study was to not have had any breast preventive tests for at least three years.

Measures

A 25-item, self-completed and anonymous questionnaire, based on HBM, was used for data collection (Attia et al, 1997, Champion 1993) and was validated in Greek according to the Trust's Scientific Advisory Committee process (Medical Outcomes Trust, 1997). The first section of the questionnaire concerned demographic data (age, family status, number of children, nationality, profession, insurance, education, monthly income, residence and number of people in one household), while the second included items concerning the HBM domains (How susceptible women think they are to the disease (breast cancer), the benefits of the adoption of the preventive behavior (self-examination, mammography, examination by a clinician), the barriers of undergoing a mammography and breast examination by a clinician). The degree of seriousness of the disease was not assessed, as cancer is always perceived as a serious disease in Greek culture.

The participants were asked to complete the questionnaires 3 times (at baseline, post intervention and six months post intervention). Immediately after their completion, at the 6 months post-intervention questionnaire, 4 items were added assessing the behaviour change. The participants of the study signed a written form of informed consent before completing the questionnaires.

The aims of the intervention were to: 1) raise awareness about women's susceptibility to breast cancer, 2) increase levels of perceived benefits of breast self-examination, clinical breast examination and mammography, 3)

decrease levels of perceived barriers to mammography and breast examination by a clinician 4) increase self-efficacy to breast self-examination, 5) increase the number of women undergoing mammography and clinical breast examination.

The health education intervention included a lecture, discussion and leaflets in a 90-minute one-off encounter. A 30-minute lecture was conducted using a Power-Point presentation by a female doctor and nurse from the local hospital. The lecture consisted of knowledge about breast anatomy, incidence, mortality, risk factors for breast cancer development, self-examination and its techniques, breast examination by a clinician and the significance of early detection of cancer through mammography. A discussion followed and women were encouraged to ask questions. Moreover, women were given pamphlets about breast cancer emphasizing the benefits of early detection, produced by the Greek Ministry of Health. Moreover, instructions were given to women for easy access to screening services.

The statistical analysis was implemented by the statistical program SPSS for Windows (version 10.1) statistical software (SPSS Inc., Chicago, IL).

Results

Sociodemographic data

The median age of the women who participated in the intervention was 44, 2 years and only 6 women (2%) were over 70 years. 132 women (44%) were married and 168 (55%) were single, widowed or divorced. 151 of the participants (50.3%) had children. Almost half of the participants (N=154, 51.3%) had high school education (12 years), 92 (30.3%) graduated from a higher educational institute (16 years) and 49 (16.3%) had basic education (9 years). 243 (90%) of the study sample had Greek nationality while 210 women (77.60%) were housewives. All women had national insurance coverage, while only 21 (7%) had additional private insurance. Table 1 presents women's perceived susceptibility towards the disease (items 1,2,3), perceived benefits

(items 4,5) and perceived barriers (items 6- intervention.
12), before, after and six months post

Table 1 : Women's beliefs towards breast cancer prevention

ITEMS	AGREE N (%)	DISAGREE N (%)	DO NOT KNOW N (%)	P-value*
Item 1: “My health is OK, that’s why I do not think at all that perhaps sometime I may develop breast cancer”				
BEFORE INTERVENTION (N=300)	175 (58.20)	95 (31.80)	30 (10)	
SHORTLY AFTER (N=300)	42 (14)	233 (77.70)	25 (8.30)	P=0.002
AFTER 6 MONTHS (N=270)	8 (3)	262 (97)	-	P=0.170
Item 2: “When I learn that a familiar woman developed breast cancer, I think that it may happen to her too”				
BEFORE INTERVENTION (N=300)	158 (52.70)	72 (24.70)	68 (22.70)	
SHORTLY AFTER (N=300)	12 (4)	254 (84.70)	34 (11.30)	P=0.566
AFTER 6 MONTHS (N=300)	250 (92.6)	20 (7.4)	-	P=0.001
Item 3: “As the years pass, there is a higher possibility for me to develop breast cancer”				
BEFORE INTERVENTION (N=300)	140 (46.70)	54 (18)	106 (35.30)	
SHORTLY AFTER (N=300)	208 (69.30)	69 (23)	23 (7.70)	P=0.426
AFTER 6 MONTHS (N=270)	249 (92,30)	21 (7,70)	-	P=0.620
Item 4: “The more that women undergo a mammography regularly the fewer deaths will occur due to breast cancer”				
BEFORE INTERVENTION (N=300)	199 (66.30)	27 (9)	74 (24.70)	
SHORTLY AFTER (N=300)	262 (87.30)	15 (5)	23 (7.30)	P=0.240
AFTER 6 MONTHS (N=270)	244 (90.40)	26 (9,60)	-	no statistics -constant variable
Item 5: “I can discover a tumor sooner through self-examination than visiting a clinician once a year”				
BEFORE INTERVENTION (N=300)	31	10.30	58.70	
SHORTLY AFTER (N=300)	88	6.30	5.70	P<0.001
AFTER 6 MONTHS (N=270)	96,70	3,30	-	p=0.949
Item 6: “If I discover a tumor by myself it would be too late”				
BEFORE INTERVENTION (N=300)	35.30	38.70	26	
SHORTLY AFTER (N=300)	4.30	89	7	p=0.362
AFTER 6 MONTHS (N=270)	0,70	99,30	-	p=0.670

* p: Pearson chi-square p-value before and shortly after intervention and before and 6 months after intervention.

Table 2: Women beliefs towards breast cancer prevention

ITEMS	AGREE N (%)	DISAGREE N (%)	DO NOT KNOW N (%)	p-value*
Item 7: “I am not able to do self-examination appropriately”				
BEFORE INTERVENTION (N=300)	137 (45.70)	68 (22.70)	95 (31.70)	
SHORTLY AFTER (N=300)	61 (20.30)	215 (71.70)	24 (8)	p=0.101
AFTER 6 MONTHS (N=270)	10 (3,70)	260 (96,30)	-	p=0.473
Item 8: “Although mammography and breast examination by a clinician are useful tests, I feel ashamed to undergo them”				
BEFORE INTERVENTION (N=300)	159 (53)	127 (42.30)	14 (4.70)	
SHORTLY AFTER (N=300)	33 (11)	258 (86.30)	9 (2.70)	p=0.005
AFTER 6 MONTHS (N=270)	45 (16,50)	225 (83,50)	-	p=0.241
Item 9: “I will experience pain If I undergo a mammography”				
BEFORE INTERVENTION (N=300)	147 (49)	102 (34)	51 (17)	
SHORTLY AFTER (N=300)	12 (4)	279 (93)	9 (3)	p=0.098
AFTER 6 MONTHS (N=270)	47 (17,60)	223 (82,40)	-	p=0.096
Item 10: “Mammography is a dangerous test”				
BEFORE INTERVENTION (N=300)	153 (51)	105 (35)	42 (14)	
SHORTLY AFTER (N=300)	24 (8)	270 (90)	6 (2)	p=0.001
AFTER 6 MONTHS (N=270)	8 (2,90)	262 (97,10)	-	p=0.866
Item 11: “The regular test of my breast it would be stressful for me while anticipating the results”				
BEFORE INTERVENTION (N=300)	152 (50.70)	108 (36)	40 (13.30)	
SHORTLY AFTER (N=300)	23 (7.70)	267 (89)	10 (3.30)	p=0.036
AFTER 6 MONTHS (N=270)	46 (16,20)	224 (83,80)	-	p=0.183

* p: Pearson chi-square p-value before and shortly after intervention and before and 6 months after intervention.

Women's perception to personal risk of getting breast cancer, was investigated through the question "I believe that I have the same risk with other women to develop breast cancer" and the "agree" answers corresponded to the rates of 100 (33.3%), 244 (81.3%), 261 (96.7%), before, shortly after and six months post-intervention respectively.

Regarding behaviour changes (breast self-examination, clinical examination, mammography), six months after the intervention, 244 (90.4%) of the women were able to perform breast self examination and out of them 180 (73.90%) did it every month. 149 women (55.1%) had undergone both breast examination by a clinician and a mammography. For 136 women (91%) the results of these tests were negative and for 13 women (9%) further tests were suggested. The main reasons for avoiding mammography and clinical breast examination were embarrassment (N=16, 13.1%), forgetfulness (N=14, 11.5%), fear of pain (N=12, 4.1%), no need of doing them (N=2, 1.6%), and economic reasons (N=2, 1.6%).

Discussion

The findings of the pre-test showed that this population held many misconceptions about breast cancer which may have a negative impact on preventive behaviour of women. It is worth mentioning that the answer "I do not know" given by many participants at the baseline had disappeared at the six-month follow-up period.

The program was effective in increasing perceived susceptibility to breast cancer, perceived benefits of breast self-examination, clinician breast examination and mammography as well as self-efficacy of breast self-examination. At the 6-month follow up, most of the "positive" beliefs were maintained or improved. Moreover, during the follow-up period, five in ten women underwent mammography and breast examination by a clinician, and more than seven to ten women performed self-examination every month. Statistical

significance regarding undergoing mammography, clinical breast examination and self-examination, was not observed ($p>0.05$), according to linear regression. However, there are other studies pointing out that destitute, single, unemployed women, with basic education only and over 65 are under-users of screening services (Arrossi et al 2008, Husaini et al 2001, Feldstein et al 2011).

Few women above the age of 70 participated to the study. Earlier studies report that age is among the variables that are statistically associated with inclination to participate in breast screening (Gordon et al, 1991).

Perceived Susceptibility

The perception that one is highly susceptible is a positive factor of intention influencing women's decision on performing breast self-examination and having a mammography (Fulton et al 1991, Han et al, 2009, Aarts et al 2011, Canbulat and Uzun, 2008, Avci & Gozum, 2009). In our study, it seems that women felt much more susceptible especially shortly after the intervention ($p=0.002$) and at the 6-month follow up compared to the baseline (items 1, 2, 3 and item about perceived risk). No statistical correlation was found from any of the demographic data ($p>0.05$). Other researchers support that perceived susceptibility can be modified after suitable health education interventions (Brodersen et al 2011, Azaiza & Cohen, 2006, Cohen & Azaiza, 2010, Gallagher 2011, Secginli & Nahcivan 2011). The rate of women -in the current study- who answered that they have the same risk with other women to develop breast cancer tripled during the follow up period. A meta-analytic review supports that usually, women have an optimistic bias about their personal risk, which is modified after attending health promotion programs (Katapodi et al 2004, Ogedegbe et al, 2005).

Perceived Benefits

During the 6-month post-intervention period, nine to ten women believed that mammography saves lives (item 4). Also, women were more aware of the value of self-

examination, however, no statistical significance was found through linear regression ($p > 0.05$). Women with high scores of perceived benefits are more likely to attend screening tests than women with lower scores of perceived benefits (Lagerlund et al, 2000). The perceived benefits of breast self-examination and mammography are positively affected by health education programs (Han et al, 2009, Secginli & Nahcivan, 2011).

Perceived Barriers

Many women hold a negative view of breast cancer (Schettino et al, 2006). Such attitudes have a negative impact on getting a mammography (Husaini et al, 2001). Fatalism in our study (item 6) was associated significantly with low income ($p = 0.001$), increased age ($p > 0.023$) as well as with low education ($p = 0.002$). These correlations coincide with similar studies investigating health beliefs (Mayo et al, 2001).

Behaviour Change

Breast self-examination

Health education intervention empowered women to trust their ability as seven in ten women practiced self-examination every month. According to statistical tests, no statistical significance was observed with any demographic data. Breast self-examination is not often practiced by women even if women are health professionals themselves (Rosvold et al, 2001, Canbulat & Uzun, 2008, Bastani et al, 1994, Soyer et al, 2007). However, past literature demonstrates that breast cancer health education programs influence women's motivation and self-efficacy in self-examination (Han et al, 2009).

Clinical breast examination and mammography

Five in ten women underwent breast examination by a clinician and mammography during the next six months following the health education intervention. It could be argued that it was a high rate compared with other health education intervention studies where fewer women than our sample's got a mammography

although more sophisticated methods of health education were used (Gozum et al, 2010, Cohen & Azaiza, 2010). On the other hand, some other interventions motivated higher rates of women getting a mammography after health education programs (71%, 79%) (Billette de Villemeur et al, 2007, Kidder, 2008).

Barriers in practice

Embarrassment is very often a barrier for noncompliance to mammography (Azaiza & Cohen, 2006, Crump et al, 2000, Trigoni et al, 2008, Alexandraki et al, 2010). Women in our program, appeared to overcome this feeling immediately after the intervention ($p = 0.005$); however they started relapsing at the follow up (item 8). The statistical linear regression did not show significant correlation with any demographic factor. Doctor's provision of information and explanations seems to be an important factor in decreasing embarrassment and increasing women's likelihood of getting screened (Goldman et al, 2004, Trigoni et al, 2008). Fear of pain is, also, a common predictor for women not getting screened (Ogedegbe et al, 2005, Trigoni et al, 2008, Alexandraki & Mooradian, 2010). In the current study, perceived fear of pain seemed to be defeated shortly after the intervention but started reappearing at the 6-month follow up (item 9). The levels of perception that mammography is not hazardous to health were raised and improved especially shortly after intervention ($p = 0.001$) (item 10). This fear rarely is mentioned in literature as a barrier (Azaiza & Cohen, 2006). Anxiety levels while anticipating the results appeared to act as a barrier to screening mammography, perhaps as serious a barrier as cultural beliefs and economics (Adler, 1997). In our research, fear of pain as a barrier presented lower rates shortly after the intervention ($p = 0.036$), however, the rate declined six months later. Future studies on how to reduce anxiety when anticipating test results should be carried out. The findings of the current study are congruent with a previous similar research in Greece pointing out the same perceived barriers for women in

mammography, i.e. embarrassment, fear of pain and stress while anticipating the results (Trigoni et al, 2008).

The results of the present study support that the brief health education intervention improved women's health beliefs and health behaviour towards breast cancer prevention. This type of health education intervention is not of high cost, and not in need of extra fund. The existing personnel are enough for such interventions and seem to be effective in hard economic times, where resources are sparse. Such interventions are easily administered, require no special tools, could lead to early diagnosis of breast cancer, if performed regularly, and could involve all women of the region. Maybe women from the same social network – as the local women associations of our sample - can influence each other to adopt preventive behaviours. The importance of social context to direct impact of behaviour has been pointed out by other authors too (Joseph et al, 2009). Therefore, more and thorough studies are needed to support these present findings.

The limitations, of the study were that it was carried out on a small sample of women of an existing social network in two specific regions and therefore the results cannot be generalized. Also, a substantial limitation was the one-off brief nature of the program and the traditional techniques used (lecture, pamphlets). Moreover, the role of culture on health beliefs and behaviour was not assessed in the present study as it is not included in HBM. Of course, there may be other salient factors operating to influence perceived barriers that may not be revealed by the Health Belief Model.

In conclusion, we could support that the brief health education intervention was successful in positively modifying women's beliefs and behaviour by raising the levels of perceived susceptibility and by decreasing the levels of barriers to breast cancer self-examination, clinical examination and mammography. These modifications remained at the follow-up, however, important barriers for women to continue regular screening start

reappearing at follow-up, i.e. embarrassment, fear of pain, and anxiety while anticipating the results. Tailored interventions are necessary to strengthen and sustain the results of such populations. Emphasis should be given to the importance of doctors' role in breast screening recommendation in a sensitive way so women can make informed decisions to undergo breast preventive tests. Perhaps, the intervention is appropriate for women who have similar demographic profile in conditions where resources are sparse.

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