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Psychological predictors of attendance at annual breast screening examinations

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Summary This retrospective analysis of psychological predictors of attendance studied the women from the annual screening arm of the United Kingdom Coordinating Committee on Cancer Research (UKCCCR) trial of annual screening mammography for the early detection of breast cancer. Some women attended screening at the first invitation in year 1 (attenders), others did not attend for screening at any time (non-attenders), whereas a third group delayed attending until year 2 (ambivalent attenders). A total of 147 women were recruited to the study: 80 attenders, 28 non-attenders and 39 ambivalent attenders. It proved extremely difficult to contact non-attenders to take part in the study. Non-attenders were significantly more depressed on the Hospital Anxiety and Depression Scale; had experienced more miscarriages, stillbirths or terminations of pregnancy; were less knowledgeable about mammography; and were displeased to have received an invitation to screening. Whereas non-attenders are unlikely ever to attend breast screening because of their long-standing attitudes and preferred coping styles, ambivalent attenders may become more amenable to screening with the passage of time. In this study such women were persuaded to attend in year 2 with a simple, cost-effective intervention: an additional invitation letter after a year.

Keywords: attendance; breast screening; depression; perinatal losses; psychology

Low take-up rates for breast screening examinations pose a serious challenge for health promotion. Attenders and non-attenders for mammography have now been compared in a variety of UK, European and US settings, and the studies of Fallowfield, Rimer, Vernon, Frazier, Sutton and Polednak are useful exemplars. From an extensive list of studies (Kruse and Phillips, 1987; McEwen et al, 1989; Rimer et al, 1989, 1991, 1996; Eardley and Elkind, 1990; Fallowfield et al, 1990; Frazier & Cummings, 1990; Haiart et al, 1990; Vernon et al, 1990, 1992; Donato et al, 1991; Gordon et al, 1991; Orton et al, 1991; Polednak et al, 1991; Glockner et al, 1992; Kee et al, 1992; Calle et al, 1993; Miller & Champion, 1993; Rakowski et al, 1993, 1995; Bostick et al, 1994; Champion, 1994*a*; Hurley et al, 1994; Sutton et al, 1994; Dolan et al, 1995; Potvin et al, 1995), some common themes can be identified. (1) Variables associated with attendance include higher socioeconomic status, younger age, higher education, more cervical smears and dental checks and other health-promoting behaviours, not smoking, high perceived vulnerability to breast cancer and perceived importance of attendance for screening. (2) Non-attenders tend to see the screening clinic as a place of risk, are afraid of cancer being found, feel screening is unnecessary, have fewer sources of social support, are fearful of pain or embarrassment, believe cancer cannot be cured and are more likely to feel that 'one shouldn't go looking for trouble'.

Several studies have found that having had at least one previous mammogram was the best predictor of attendance (Rakowski et al, 1993; Rodriguez et al, 1995; Beaulieu et al, 1996; Johnson et al, 1996). Other studies have cited lack of knowledge as the best predictor of non-attendance (Mandelblatt et al, 1992; Morgan et al, 1995; Wardlow & Curry, 1996). Having more social ties predicted attendance in a study by Kang et al (1994).

Attendance for breast screening has been studied as a function of personality. Munn (1993) found that apathy, lack of concern and lack of perceived need were reasons given for non-attendance. Lerman et al (1993) found that non-attenders had fewer worries and intrusive thoughts about breast cancer than attenders among women at risk. Kreitler et al (1994) found attenders to be realistic, accepting of life's limitations, optimistic, emotionally controlled. Hammond and Stewart (1994) found that non-attenders were more afraid of medical tests and were less likely to want to know if they had cancer. Siegler and Costa (1994) reviewed the literature on personality and breast screening and Siegler et al (1995) discovered that attendance was predicted by conscientiousness, extroversion and lower depression scores, but not by anxiety.

Three studies (Bundek et al, 1993; Murray and McMillan, 1993; Rothman et al, 1993) investigated locus of control and found that internal locus of control predicted breast self-examination (BSE), showed that BSE was associated with a low belief in the role of powerful others and found that messages that emphasized internal locus of control were more successful than information-only messages.

Several studies have predicted attendance as a function of the Health Belief Model (Fulton et al, 1991; Aiken et al, 1994; Champion, 1994*b*; Fischera and Frank, 1994), which suggests that patients' participation in screening will be affected by perceived seriousness of the disease and perceived susceptibility to the disease. The likelihood of action will depend on the balance between the perceived benefits of and perceived barriers to preventive action.

Most mammography screening units routinely send reminders to non-attenders. Taplin et al (1994) found that a follow-up postcard nearly doubled the odds of participation, and in a study by

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Hurley et al (1994) a second letter to non-attenders increased attendance 13-fold. Kendall and Hailey (1993) found that a reassuring letter style was a better predictor of attendance than a standard hospital reminder.

The present study used the 1-year arm of the UKCCCR frequency trial for the early detection of breast cancer. In the UK, women aged 50–64 are invited to attend a breast screening examination every 3 years. The UKCCCR trial investigated whether annual mammography was superior to 3-yearly screening. Some women accepted the first invitation in year 1 (attenders), others did not attend for screening in either year 1 or year 2 (non-attenders), whereas a third group delayed attending until year 2 (ambivalent attenders). It was of interest to discover whether there were significant differences in psychological characteristics between attenders, non-attenders and ambivalent attenders. The psychological characteristics of ambivalent attenders have not been studied before.

Our structured interview questions were drawn from previous studies (Bowling, 1989; McEwen et al, 1989; Rimer et al, 1989; Eardley and Elkind, 1990; Frazier and Cummings, 1990; Haiart et al, 1990; Vernon et al, 1990, 1992; Williams and Vessey, 1990; Bull and Campbell, 1991; Donato et al, 1991; Fulton et al, 1991; Gordon et al, 1991; Lerman et al, 1991*a,b*; Montano and Taplin, 1991; Orton et al, 1991; Polednak et al, 1991; Cassileth, 1992; Kash et al, 1992) and especially from the work of Fallowfield et al (1990). Among the Health Belief Model variables were extent of worry about breast cancer and nature of beliefs about risk and treatment effectiveness. The interview tested for reasons for patient delay in presentation with breast symptoms (Green and Roberts, 1974; Greer, 1974; Magarey et al, 1977; Timko, 1987). We looked at the effect of personality variables and psychological symptomatology including internal vs external locus of control, the habitual suppression of negative feelings, anxiety, depression and coping style.

METHOD

The sample

A sample of 90 each attenders, non-attenders and ambivalent attenders of the UKCCCR frequency trial (aged between 50 and 62) were asked by letter from the Breast Screening Service whether they would be willing to discuss their attitudes toward breast screening in an interview with a research nurse. Home visits were arranged by letter or telephone. Whereas 75% of attenders were willing to be interviewed, only 20% of the women in the ambivalent attenders group and 10% of the non-attenders group agreed to participate. A further group of women thought to be non- or ambivalent attenders were approached. Twelve of these were found to be attenders, probably because their numbers were identified from the UKCCCR database before all the attendance records were complete. Non-attenders tended not to reply to letters, not to have telephones or to have ex-directory telephone numbers, and to refuse on the doorstep if the research nurse visited. Post office returns were excluded before the women were considered non-attenders, and the study uncovered women who had died (3), moved away (12) or changed their minds about being interviewed (3). Twenty-five women contacted by telephone declined to be interviewed. The resulting final sample was: 80 attenders (54% of the sample), 28 non-attenders (19% of the sample) and 39 ambivalent attenders (26% of the sample).

The structured interview

The structured interview covered the following areas: demographics and reproductive history, knowledge about breast screening, reactions to the invitation to screening, other health-promoting behaviours, breast self-examination, family history of breast cancer, use of medical services, previous investigation of breast lumps, reasons for not attending breast screening (where applicable), reaction to second invitation letter (where applicable), reactions to breast screening (for those who attended), knowledge about breast cancer and risk factors, perceived vulnerability, attitudes towards screening and attitudes towards treatment efficacy.

Interviewing technique and questionnaires

In a home-visit interview lasting approximately 40 min, subjects were given a set of index cards on which the interview questions appeared. A research nurse recorded the patient's response to each question on a form. At the close of the interview she gave the patient questionnaires to complete and return to the Breast Screening Service in a stamped addressed envelope as follows:

- the Hospital Anxiety and Depression Scale, HADS (Zigmond and Snaith, 1983);
- the Multidimensional Health Locus of Control Scale, MHLC (Wallston and Wallston, 1978);
- the Courtauld Emotional Control Scale, CECS (Watson and Greer, 1983); and
- an adaptation of the Mental Attitudes to Cancer Scale, MAC (Watson et al, 1988, 1989, 1991).

These questionnaires have been widely used with cancer patients and provide well-validated measures of anxiety and depression (HADS); locus of control (internal, powerful others and chance, MHLC); habitual suppression of anxiety, depression and anger (CECS) and the coping styles of fighting spirit, fatalism, helpless/hopeless, anxious preoccupation (MAC). Compliance in returning the questionnaires was in excess of 80% in all groups: 72 out of the 80 patients in group 1 (90%), 25 out of 28 patients in the non-attenders group (89%) and 32 out of 39 patients in the ambivalent attenders group (82%).

RESULTS

Because of the large number of variables, the significance level was set at 0.01 for intergroup comparisons (Table 1). Non-attenders were significantly more depressed on the Hospital Anxiety and Depression Scale. They had also experienced significantly more miscarriages, stillbirths or terminations of pregnancy. The latter was an unexpected finding. The occurrence of at least one perinatal loss was similar across groups; however, non-attenders had a significantly larger number of losses than women who had attended for screening at least once. The number of miscarriages, stillbirths or abortions correlated significantly with HADS anxiety ($F = 4.43$, d.f. = 1, 130; $P = 0.037$) and especially with HADS depression ($F = 7.47$, d.f. = 1, 129; $P = 0.007$).

The three groups did not differ significantly on HADS anxiety, locus of control (MHLC), suppression of negative emotions (CECS) or coping style (MAC). Nor did they differ significantly on demographic variables, although there were interesting non-significant trends. Proportionately more non-attenders were in social classes III, IV and V, and women from non-white ethnic

Table 1 Characteristics of attenders, non-attenders and ambivalent attenders

	Attenders	Non-attenders (ANOVA)	Ambivalent attenders	Signif. level
(a) *Continuous variables [mean (s.d.)]*				
Age	58.7 (0.42)	58.3 (0.71)	58.7 (0.60)	NS
Age at menarche	13.3 (0.22)	13.3 (0.37)	13.5 (0.31)	NS
Age at menopause	47.6 (0.65)	46.7 (1.1)	47.8 (0.93)	NS
No. of live births	2.53 (0.20)	3.32 (0.34)	3.12 (0.29)	0.053
No. of miscarriages, stillbirths, terminations	0.49 (0.13)	1.48 (0.23)	0.49 (0.19)	0.001*
No. of years since last cervical smear test	5.49 (0.77)	7.17 (1.34)	3.67 (1.09)	NS
HADS anxiety	6.75 (0.45)	8.32 (0.76)	6.54 (0.64)	NS
HADS depression	3.72 (0.38)	5.64 (0.65)	3.29 (0.55)	0.015*
MHLC internal	24.0 (0.69)	24.8 (1.16)	23.7 (1.01)	NS
MHLC powerful others	19.4 (0.78)	19.3 (1.31)	18.5 (1.16)	NS
MHLC chance	19.1 (0.73)	19.3 (1.24)	21.0 (1.10)	NS
CECS anger	17.7 (0.60)	17.8 (1.02)	17.7 (0.90)	NS
CECS depression	20.5 (0.61)	21.1 (1.04)	19.9 (0.90)	NS
CECS anxiety	18.9 (0.58)	21.0 (0.99)	19.1 (0.88)	NS
CECS total	57.0 (1.54)	60.0 (2.65)	55.5 (2.30)	NS
MAC fighting spirit	49.3 (0.94)	50.2 (1.60)	50.3 (1.41)	NS
MAC help/hopeless	10.8 (0.38)	11.7 (0.64)	10.9 (0.57)	NS
MAC anx. preoccup.	21.4 (0.54)	21.2 (0.92)	20.7 (0.82)	NS
MAC fatalism	18.3 (0.42)	19.7 (0.72)	18.4 (0.63)	NS
(b) *Categorical variables [number (percent)]*		(Chi square)		
Marital status				
Married	63 (79)	22 (79)	28 (72)	NS
Other	17 (21)	6 (21)	11 (28)	
Education				
Up to 'O' level	72 (90)	24 (86)	36 (95)	NS
'A' level or higher	8 (10)	4 (14)	2 (5)	
Social class				
I and II	31 (39)	6 (21)	17 (44)	NS
III, IV and V	49 (61)	22 (79)	22 (56)	
Ethnic background				
White UK/European	75 (94)	24 (86)	33 (85)	NS
Other	5 (6)	4 (14)	6 (15)	
Occupation of partner				
Unemployed	1 (2)	0 (0)	0 (0)	NS
Retired	31 (47)	5 (23)	7 (24)	
Employed	34 (51)	18 (79)	22 (76)	
Correct answers for:				
What is a mammogram?	79 (99)	20 (71)	37 (95)	0.000*
What is a smear test?	79 (99)	28 (100)	37 (95)	NS
What is a mastectomy?	74 (93)	21 (75)	30 (77)	0.021
Worried re screening	28 (35)	10 (36)	16 (41)	0.041
Displeased re screening	9 (11)	18 (64)	17 (44)	0.000*
Last appointment with GP				
Within last month	51 (65)	16 (57)	30 (77)	0.007*
1 year ago or more	28 (35)	12 (43)	9 (23)	
Previous mammogram	24 (30)	4 (14)	7 (18)	NS

*$P < 0.01$

backgrounds were also over-represented among non-attenders and ambivalent attenders. Over 90% of women in the attenders and ambivalent attenders groups correctly answered the question, 'What is a mammogram?' whereas only 71% of non-attenders answered this question correctly. Most attenders were pleased to have received an invitation to screening, but 64% of non-attenders and 44% of ambivalent attenders were displeased. Non-attenders consulted their GP infrequently compared with other groups. Proportionately more attenders than non-attenders and ambivalent attenders had previous experience of mammography.

Only 12% of those who attended screening found the mammogram embarrassing, predominantly from the ambivalent attenders group. A total of 86% found the examination uncomfortable, and 64% found it painful. Most (83%) said they attended because they

wanted the reassurance of knowing the result was normal. The majority said they would attend again for screening, and would encourage other women to do so. Among the reasons given for non-attendance were examples of the coping style of cognitive avoidance, an active and direct effort to push away unwanted anxiety-arousing information:

- 'I'd rather not think about it.'
- 'I push things like this to one side, and try not to think about them.'
- 'I was afraid what they might find, and I'd rather not know if I have cancer.'

Women who delayed a year in attending were asked what helped them to respond to the second invitation.

- 'My family persuaded me to change my mind.'
- 'I was scared to go the first year but bucked up the courage to go the second time.'
- 'I used to be a hypochondriac, but decided to change my attitude.'

Non-attenders were asked why they did not respond to the second-year invitation.

- 'I still felt the same, that it wasn't necessary.'
- 'I tried to convince myself to go, but couldn't build up the courage.'
- 'I couldn't take on any more worries after my son committed suicide.'

Knowledge about breast cancer in the group as a whole was poor. They were asked which women were more likely to develop breast cancer, and 78 (53%) thought those with a family history, 60 (41%) thought those who took the contraceptive pill, 59 (40%) thought those who had been hit in the breast, 9 (6%) thought single women. A list of risk factors for breast cancer was proposed, and women were asked which of these they believed could cause the disease. Fifty-three (36%) did not know, 44 (30%) thought smoking cigarettes, 40 (27%) thought stress and worry, 14 (10%) thought not breast feeding babies, 11 (7%) thought overweight and drinking too much alcohol. All groups showed misinformation and superstition and there were no significant differences between groups on perceived risk factors.

In response to questions about personal vulnerability and successful treatment, again misinformation was common. Only 111 (76%) thought they could have breast cancer without feeling ill; 104 (71%) thought they were unlikely to get breast cancer in the next 10 years; only 74 (50%) realized that mammography can miss cancer when it is present; 10 (7%) thought that if a lump was found it would be too late to do anything about it. Only three women in the study believed that cancer was infectious, two non-attenders and one ambivalent attender. Proportionately more non-attenders and ambivalent attenders were 'not sure' whether breast cancer could be successfully treated without the loss of the breast. Significantly more non-attenders and ambivalent attenders thought the prognosis was poor if they developed the disease.

Health-promoting behaviours were measured in the study but no significant differences were found between groups. A total of 93% always wore seat belts, 86% tried to eat healthy foods, 67% took some exercise, 60% were non-smokers and 25% had tried to stop smoking. A total of 48% reported someone close to them having developed breast cancer, but only 44% examined their breasts every month.

DISCUSSION

Like us, Fallowfield et al (1990) encountered difficulties in contacting non-attenders. One woman in their study wrote, 'I really don't want to know if I have cancer, and if I do have cancer, it cannot be cured, so I prefer to remain as I am, as daft as it may sound to you'. Cognitive avoidance was common among the non-attenders we were able to interview. Health information may not reach these women because their coping strategy is to banish from awareness any information that brings with it negative or threatening emotion.

Non-attenders' lack of response to our research nurse's invitation mirrored their pattern of ignoring mammography invitations. Their coping style does not allow them to deal with the anxiety and uncertainty involved, and they may never be persuaded to attend. 'Essentially, we are asking women to try, regularly, to locate something in their bodies that will result in some degree of mutilation. We are asking women to try hard to find cancer in themselves' (Cassileth, 1992). In related work, Wardle and Pope (1992) have helpfully reviewed the psychological costs of screening for cancer, and recognized alarm in those invited to attend, and trauma in those who received a cancer diagnosis with no preceding symptoms.

The finding of three times as many miscarriages, stillbirths or terminations of pregnancy among non-attenders compared with attenders has not to our knowledge been seen previously. The questions were included for completeness under reproductive history and should be replicated with larger samples. It is possible that women who have had these experiences are reluctant to attend the hospital for other procedures that might result in an upsetting outcome. The correlation between depression and a history of perinatal loss is of related interest. Our finding of higher depression (but not anxiety) among non-attenders is in agreement with Siegler et al (1995).

Our results lend some support to studies of the Health Belief Model as a predictor of screening attendance. Non-attenders had poorer knowledge about breast cancer, were infrequent visitors to their GPs and had a longer interval since their last cervical smear test than attenders. Non-attenders were significantly more likely to believe that breast cancer could not be cured. Fallowfield et al (1990) found that 35% of women believed that being hit in the breast was a cause of breast cancer, our figure was 31%. Our study confirms previous findings of widespread misinformation and misconceptions about breast cancer.

In a review of the UK breast screening programme Austoker (1994) suggested that attendance could be improved by targeting the relevant attitudes and beliefs of non-attenders. Local and national publicity campaigns and advice given by GPs are seen as key sources of influence, but whether a lifelong coping strategy of cognitive avoidance can be successfully challenged by health education information remains an urgent question for further research. Non-attenders in our study tended not to reply to letters or telephone calls. They were extremely difficult to contact and appeared almost to have withdrawn from the outside world, or at least from answering their post. By contrast, ambivalent attenders may be amenable to persuasion, like floating voters. In our study such women were persuaded to attend the following year with a simple, cost-effective intervention: an additional invitation letter.

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