

Efficacy of Breast Cancer Appeals for Promoting Physical Activity

Running title: Breast cancer appeals for promoting physical activity

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Abstract – Background. We investigated the efficacy of breast cancer prevention messages in increasing intentions to be more active. Method. We randomly assigned 200 females aged 30-60 years to a breast cancer and physical activity message or a cardiovascular disease and physical activity message. Results. The breast cancer message was more believable and slightly more motivating to increase physical activity than the cardiovascular disease message, and 72% of respondents in the breast cancer condition increased their intention to increase their physical activity. Conclusion. The benefit of reducing the risk of breast cancer can be used to motivate increased physical activity in women.

Introduction

Breast cancer is the second most common internal cancer in the world behind lung cancer (1.05 million new breast cancer cases in 2000).¹ In Australia, breast cancer is the most frequently occurring internal cancer among females, with 11,791 diagnosed with the cancer in 2001.² Physical activity has been found to reduce the risk of coronary heart disease, type 2 diabetes,³ and there is now increasing evidence that physical activity is a means for the primary prevention of cancer,⁴ with the evidence for decreased risk with increased physical activity classified as convincing for breast cancer.⁵ For females, it is estimated that 10% of breast cancers worldwide are attributable to physical inactivity.⁶ Furthermore, evidence is increasing that physical activity reduces cancer-related fatigue,⁷ improves quality of life⁸ and survival after breast cancer diagnosis.⁹⁻¹⁰

People's salience of links between physical inactivity and increased risk for breast cancer and other common cancers is minimal. In 2000, a nationwide telephone survey of 2,500 Australians aged 20 years plus found that less than 1% mentioned physical activity as influencing people's chances of getting breast cancer.¹¹

In a recent study, Jalleh et al.¹² investigated whether increasing people's awareness of the link between physical activity and cancer could be effective in motivating increased physical activity among relatively inactive people. Their study found that two in three respondents presented with messages about bowel cancer prevention had increased intention to increase their level of physical activity, and therefore provided evidence of the efficacy of promoting physical activity in reducing the risk of bowel cancer.

Following considerable publicity about Kylie Minogue's breast cancer diagnosis in 2005, it was decided to extend the Jalleh et al. study¹² by investigating the persuasiveness of messages about breast cancer prevention relative to messages about cardiovascular disease prevention in increasing intentions to be more physically active. While the Jalleh et al. study¹² provides evidence that bowel cancer could be promoted to increase awareness of the link between physical inactivity and cancer, it could be argued that promoting the link between breast cancer and physical inactivity could be even more effective given that breast cancer generates more media attention and publicity than bowel cancer as this latter cancer is still difficult to discuss and rarely receives media attention. For example, women's magazines feature far more articles on breast cancer than on colon cancer.¹³⁻¹⁶

Methods

Participants

A convenience sample of 200 females aged 30-60 years was recruited by professional interviewers in the capital city downtown shopping precinct and randomly assigned to a breast cancer and physical activity message ($N=120$) or a heart disease and physical activity message ($N=80$). A response rate of 58% was achieved. Given budget constraints on sample recruitment, a narrow age range was selected for this study to include representation of the primary target group for the national screening program¹⁷ as well as women in younger age groups. Quotas were set to achieve a similar age distribution in each disease condition (30% of respondents aged 30-39 years, 40% aged 40-49 years, and 30% aged 50-60 years). Females who did regular vigorous physical activity in the past two weeks which made them breathe harder or puff and pant were excluded from the study. The majority of respondents in the breast cancer (BC) and cardiovascular disease (CVD) conditions were married or had a live-in

partner (69% and 65%, respectively). One respondent in the CVD condition and four respondents in the BC condition had been diagnosed with breast cancer in the past. Ethical clearance was provided by Curtin University Human Research Ethics Committee.

Procedure and measures

Respondents were asked to read a four page booklet containing information about physical activity and its link to breast cancer or cardiovascular disease respectively. The booklet described how modern technology and changes in lifestyle have reduced people's level of physical activity over time, and that people who lead inactive lives are more likely to suffer from health problems, particularly heart disease. In the breast cancer condition, the booklet stated: "New research provides evidence that people who lead inactive lives are more likely to suffer from breast cancer. This adds to what we already know that family history is a risk factor for breast cancer. Other than skin cancer, breast cancer is the most common type of cancer among women in Australia." Respondents in both conditions were advised to be more physically active to reduce their risk of heart disease or breast cancer. The booklets were developed by the authors using health authorities' standard health promotion messages about physical activity and were comparable in readability to those used in the Jalleh et al study.¹² Attention was given to ensure that the booklets were written in plain English using short sentences. [The booklets can be viewed online: http://cbrcc.curtin.edu.au/reports/powerpoint%20presentations/breast_cancer_booklet.ppt].

After reading the booklet, respondents were given a self-completion questionnaire. The questionnaire was developed by the authors and the main measures were based on those used in the Jalleh et al. study.¹² Behavioural intention to be more physically active as a result of reading the messages was assessed via 'how much, if at all, has the message about (breast

cancer)(heart disease) and physical activity increased or decreased your intention to try to increase your physical activity' (*increased intention a lot; increased intention somewhat; no change; decreased intention somewhat; decreased intention a lot*). Message believability and relevance were assessed on 4-point scales (*very, somewhat, a little, not at all*). The interview took approximately 20 minutes.

Results

The sample sizes for the breast cancer (BC) and cardiovascular disease (CVD) conditions were 120 and 80 respectively.

The data were analysed via a 2 (conditions: BC; CVD) X 3 (age: 30-39 years; 40-49 years; 50-60 years) univariate ANOVA for behavioural intention, message believability and relevance, Table 1 shows the means and ANOVA results.

Behavioural intention

There was no significant difference between the BC and CVD conditions for intention to increase level of physical activity ($P > 0.05$). In both conditions, approximately 70% of respondents reported an intention to increase their level of physical activity (breast cancer: 72%; cardiovascular disease: 70%). The proportion of respondents reporting 'increased intention a lot' was 20% in the breast cancer condition and 17% in the cardiovascular disease condition.

Perceived believability

The breast cancer message was perceived as significantly (but not substantially) less believable than the cardiovascular disease message (mean: 1.61 vs. 1.22), $F(1,194) = 13.32$, $p < 0.001$. However, in both the BC and CVD conditions, the vast majority of respondents rated the messages as 'very' or 'somewhat' believable: 88% vs. 98% ('very' believable response: 57% vs. 81%, respectively). The relatively high believability for cardiovascular disease reflects the extensive previous promotion of the link between physical activity and reducing the risk of heart disease.

Perceived relevance

There was no difference between the BC and CVD conditions for perceived relevance of the message: 87% of respondents in the breast cancer condition rated the message as 'very' or 'somewhat' relevant versus 88% in the cardiovascular disease condition ($P > 0.05$). The 'very' relevant responses were 51% and 58%, respectively.

There were no significant main effects for age and no significant age by disease condition interactions for any of the above measures.

Limitations of the study

The study participants were restricted to females aged 30-60 years. Caution is needed in generalising these results to females outside of this age range. Standard health promotion type messages were used in the booklets. It may well be that the use of graphic images could have produced different results, possibly having more impact.

Discussion

The message relating breast cancer to physical activity was considered believable and relevant by almost 90% of respondents. Furthermore, the breast cancer message was slightly more motivating to increase physical activity than was the cardiovascular disease message. It is likely that this motivational impact would increase with increased exposure to the message in a context that increases their believability of the message from 'somewhat' to 'very' believable. Overall, these data provide strong support for promoting physical activity via a message of reducing the risk of breast cancer.

Media interest in breast cancer is generally high, and particularly when high-profile identities disclose such a diagnosis. For example, there has been intense media attention on breast cancer following the diagnosis of two internationally renowned pop singers with breast cancer, Anastasia (American), and more recently, Kylie Minogue (Australian). Such news stories increase the salience of the health issue in the general population, and therefore, provide an opportunity for health advocates to influence people's attitudes and behaviour. For example, Chapman et al.¹⁸ found that mammography screening bookings in the two weeks during the publicity about Kyle Minogue's breast cancer diagnosis were 40% higher than in the 19 weeks before the publicity. In the eligible age-group of 40-69 years, the increase in bookings was 101%. In addition, bookings remained more than a third higher in non-screened women in the six weeks after the publicity. Such events provide the opportunity for cancer educators to reinforce messages about physical activity and breast cancer risk reduction.

Once an awareness of the link between breast cancer and physical activity has been established, it may then be easier to promote the links between physical inactivity and other common cancers. At a more general level, given the links between increased physical activity and reduced risk from some cancers, type 2 diabetes, coronary heart disease and mental

illnesses such as depression, it is indeed 'imperative'¹⁹ to seek as many motivators as possible for medical practitioners and cancer education organisations to use to motivate increased levels of physical activity among patients and the general population.

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TABLE 1. Behavioural Intention, Believability and Relevance Ratings*:
Means and 95% Confidence Intervals (CI)

	Breast cancer (n = 120)	Cardiovascular disease (n = 80)
	Mean (95% CI)	Mean (95% CI)
Behavioural intention	2.08 (1.96-2.21)	2.16 (2.00-2.32)
Believability	1.61 (1.46-1.76) †	1.22 (1.12-1.33) †
Relevance	1.68 (1.52-1.83)	1.58 (1.40-1.77)

*Ratings ranged from 1 to 4, with lower numbers representing more favourable responses.

† $P < 0.01$