

Patient preferences

Women's preferences for contralateral prophylactic mastectomy: An investigation using protection motivation theory



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ABSTRACT

Objective: Most women diagnosed with unilateral breast cancer without *BRCA1* or *BRCA2* mutations are at low risk of contralateral breast cancer. Contralateral Prophylactic Mastectomy (CPM) decreases the relative risk of contralateral breast cancer, but may not increase life expectancy; yet international uptake is increasing. This study applied protection motivation theory (PMT) to determine factors associated with women's intentions to undergo CPM.

Methods: Three hundred eighty-eight women previously diagnosed with unilateral breast cancer and of negative or unknown *BRCA1* or *BRCA2* status were recruited from an advocacy group's research database. Participants completed measures of PMT constructs based on a common hypothetical CPM decision-making scenario.

Results: PMT constructs explained 16% of variance in intentions to undergo CPM. Response efficacy (CPM's advantages) and response costs (CPM's disadvantages) were unique individual predictors of intentions. **Conclusion:** Decision-making appears driven by considerations of the psychological, cosmetic and emotional advantages and disadvantages of CPM. Overestimations of threat to life from contralateral breast cancer and survival benefit from CPM also appear influential factors.

Practice implications: Patients require balanced and medically accurate information regarding the pros and cons of CPM, survival rates, and recurrence risks to ensure realistic and informed decision-making.

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1. Introduction

Breast cancer is the most common cancer in women worldwide, with approximately 1.67 million new cases in 2012 [1]. Most commonly the disease is confined to a single breast, i.e. unilateral [2]. On average, women with unilateral breast cancer without *BRCA1* or *BRCA2* gene mutations face a low annual risk of 0.19–0.75% of developing contralateral breast cancer [3–6]. Metastatic

disease risk is comparatively 17 times higher than contralateral disease risk [6]. Chemotherapy and adjuvant hormone treatment are commonly administered to prevent metastases, and synergistically reduce the incidence of contralateral breast cancer by 20–80%. As a result of their widespread use, the incidence of contralateral breast cancer is decreasing over time [7]. However women may still be interested in, and offered, further contralateral cancer risk monitoring and risk-reduction strategies.

Routine surveillance is recommended to monitor the contralateral breast, typically facilitating the early detection of contralateral disease and thus curative treatment [8]. Prophylactic surgery may also be offered or requested. Contralateral prophylactic mastectomy (CPM) involves surgical removal of the unaffected, healthy contralateral breast tissue, and reduces relative

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contralateral disease risk by 90–95% [9–11]. Although CPM may increase life expectancy amongst *BRCA1* and *BRCA2* carriers, who face a higher annual risk of contralateral disease (3–4% per annum) [12,13], clinical evidence supporting survival benefits amongst other women is limited. For *BRCA1* or *BRCA2* negative women, a recent Cochrane review concluded that improvements in life expectancy are unlikely [13]. Reasons for this include their generally low baseline contralateral cancer risk, the efficacy of close surveillance, and because CPM cannot prevent incurable metastases, which principally determines overall survival [5,13].

CPM also carries attendant physical and psychological risks. Post-operative complications are common, including chronic pain, infection, and lymphatic fluid leakage [14]. Further, 6–20% of patients report regret after undertaking CPM, citing surgical complications, reduced sexual function, body image dissatisfaction, and feeling uninformed about available alternatives to CPM [15,16].

Despite this, there is an increasing trend worldwide towards women electing CPM over conservative risk-management strategies, particularly in North America [17]. Amongst 1.1 million American breast cancer patients, CPM rates rose from 2.0% to 12.3% from 1998 to 2011 [18]. Whilst Australia's current CPM rate is unknown, a recent survey of the Breast Surgeons Society of Australia and New Zealand showed that 44% of surgeons perceived increasing performance of CPM, compared to previous years [19]. Increased awareness and testing for high-risk genes is only partly responsible for this increasing uptake, with one study of 2965 American patients finding that only 13% had documented *BRCA1* or *BRCA2* mutations [5].

Little is understood about factors motivating CPM uptake. Attaining breast symmetry after unilateral mastectomy [15,20], overestimated perceptions of contralateral breast cancer risk [21] and CPM's efficacy in increasing life-expectancy [21,22], fear of cancer recurrence [23] and attaining breast-cancer related peace of mind [20] have all been identified as influential in patient decision-making. Media portrayals of celebrity advocates endorsing preventive mastectomy [24] coupled with patients' poor understanding of complex disease information [20] may also motivate CPM use. Research to date, however, has focused primarily on high-risk *BRCA1* or *BRCA2* mutation carriers [12,25]. Findings may not therefore generalise to other women, for whom CPM may negligibly alter life expectancy. Reviews highlight the need for more evidence on this complex decision-making process [4,25,26]. Social-cognition models provide a useful conceptual framework for elucidating cognitive and emotional predictors of risk-

management decisions [27]. Yet no previous study has applied a theoretical model to predict women's CPM decisions.

Protection motivation theory (PMT; Fig. 1) [28,29] is one social-cognition model that may prove useful in this context. PMT has shown strong utility in predicting intentions for cancer preventative behaviours including mammography attendance [30,31], *BRCA1* and *BRCA2* screening [32], breast self-examination [33,34], and risk-reducing medication and hormone therapy uptake [35,36]. PMT posits that two parallel cognitive processes function to elicit protection motivation (an individual's intentions to initiate health protective behaviour): *threat appraisal* and *coping appraisal*. Increased levels of threat and coping appraisal, in turn, heighten an individual's protection motivation.

1.1. Threat appraisal

The threat appraisal pathway sums: (i) *vulnerability* (an individual's estimate of the probability of harm from a threat, in this case, contralateral breast cancer) and (ii) *severity* (the degree of harm resulting from the threat).

1.2. Coping appraisal

The coping appraisal pathway sums: (i) *self-efficacy* (an individual's perceived capability to perform the behaviour, in this case CPM), (ii) *response-efficacy* (the behaviour's perceived success in reducing disease threat), less any (iii) *response costs* (physical, psychological or economic consequences of the behaviour).

The current study therefore aimed to investigate PMT's utility in predicting breast cancer survivors' CPM intentions. Consistent with PMT [29], it was hypothesised that higher scores on severity, vulnerability, response-efficacy and self-efficacy, and lower response cost scores would increase intentions to undergo CPM. In accordance with meta-analytic findings [37,38], coping appraisal was expected to more strongly predict CPM intentions than threat appraisal.

2. Methods

2.1. Design

This study used a cross-sectional survey.

2.2. Participant recruitment

Participants were women recruited from the Review and Survey Group of Breast Cancer Network Australia (BCNA; the largest Australian consumer advocacy organization), diagnosed with unilateral breast cancer 0–10 years prior, and aged between 18 and 70 years. Exclusion criteria included: (i) a metastatic cancer diagnosis; (ii) being a documented carrier of a *BRCA1* or *BRCA2* mutation [13]; and (iii) inadequate English language skills to complete the questionnaire. Both women with and without a prior CPM were invited to participate to ensure wide representation of views, as research suggests that patients often develop polarized preferences surrounding prophylactic surgery [39].

2.3. Procedure

Potentially eligible women were sent an email from BCNA, including a participant information sheet, survey-web link, and exclusion criteria. Interested individuals could seek further clarification from the research team via phone or email and/or anonymously complete the questionnaire, conditional upon providing online consent. After completing disease and demographic questions, participants were provided with a fact sheet

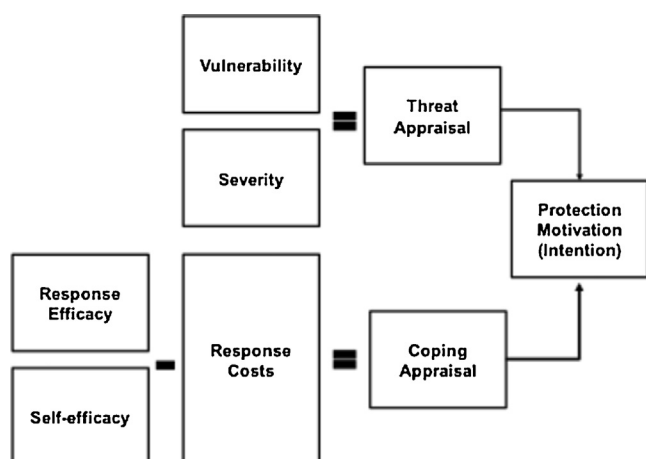


Fig. 1. Schema of protection motivation theory.

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