Patient Education and Counseling 96 (2014) 106–112

Contents lists available at ScienceDirect

Patient Education and Counseling

journal homepage: www.elsevier.com/locate/pateducou

Patient Perception, Preference and Participation

Women's preferences for selective estrogen reuptake modulators: An investigation using protection motivation theory

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ARTICLE INFO

Article history:
Received 1 December 2013
Received in revised form 29 March 2014
Accepted 16 April 2014

Keywords:
Breast cancer
Chemoprevention
SERMs
Patient preferences
BRCA1
Protection motivation theory

ABSTRACT

Objective: Selective estrogen receptor modulators (SERMs) reduce breast cancer risk by 38%. However, uptake is low and the reasons are not well understood. This study applied protection motivation theory (PMT) to determine factors associated with intention to take SERMs.
Methods: Women at increased risk of breast cancer ($N = 107$), recruited from two familial cancer clinics in Australia, completed a questionnaire containing measures of PMT constructs. Hierarchical multiple linear regression analysis was used to analyze the data.
Results: Forty-five percent of women said they would be likely or very likely to take SERMs in the future. PMT components accounted for 40% of variance in intention to take SERMs. Perceived vulnerability, severity and response efficacy appeared the most influential in women's decisions to take or not take SERMs.
Conclusion: Many women are interested in SERMs as a risk management option. Accurate risk estimation and an understanding of the benefits of SERMs are critical to women's decision making.
Practice implications: Health professionals need to explore women's perceptions of their risk and its consequences, as well as providing clear evidence-based information about the efficacy of SERMs. Exploring the source and strength of beliefs about SERMs may allow more effective, tailored counseling.

1. Introduction

Breast cancer is the most frequently diagnosed cancer among women worldwide, with an estimated 1.38 million cases diagnosed in 2008, which accounted for approximately 23% of all new cancer cases [1]. A woman's individual risk of developing breast cancer is dependent on specific factors, the most important of which are increasing age and family history [2]. The average lifetime risk for an individual with two affected first-degree relatives is approximately 20%, compared to 13% for those with one affected first-degree relative [3]. Women who carry a germline mutation in the *BRCA1* or *BRCA2* breast cancer predisposition genes have even higher risks (average lifetime risk estimates of 65% and 45%, respectively [4]), though these account for a small proportion of breast cancers.

Risk management strategies for women with an elevated risk of breast cancer include risk-reducing surgeries, namely risk-reducing mastectomy, risk-reducing pre-menopausal salpingo-oophorectomy and risk-reducing medication using selective estrogen receptor modulators (SERMs) [5] or aromatase inhibitors [6]. There is strong evidence that SERMs, such as tamoxifen and raloxifene, taken daily for five years reduce breast cancer risk by 38% [5]. However, current uptake of these agents is very low, even in women at high familial-risk [7–11]. Whilst it has been estimated

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http://dx.doi.org/10.1016/j.pec.2014.04.011
0738-3991/

that 15% of women in the United States between the ages of 35 and 79 could potentially benefit from tamoxifen [12], less than 0.2% of women in this age range are taking tamoxifen for the prevention of breast cancer [13]. Similarly, a recent national cohort study in Australia (kConFab) revealed that fewer than 3% have used SERMs for prevention, and only 0.3% have done so while not enrolled in a clinical trial [12].

Little is understood about the reasons for this less than anticipated uptake of SERMs. Negative attitudes toward, and inadequate explanation of SERMs by clinicians [10] may play a role, but patient factors are also likely to be important. Patients may feel concerned about potential side effects, which include menopausal symptoms (such as hot flushes), increased risk of thrombosis and endometrial cancer, and decrease in sexual desire and satisfaction [14–17]. Understanding how women make decisions in this context can aid in informing decisions, both in clinical practice and health policy, as well as contributing to the development of evidence-based decision aids to enable women to make truly informed choices concordant with their values.

Expectancy-value models provide a useful framework for understanding self-protective health behavior. Commonly used expectancy-value models include the health belief model (HBM; [18]), the theory of planned behavior (TPB; [19]) and protection motivation theory (PMT; [20,21]). Recent reviews [22,23] have concluded that PMT is superior to other models in explaining protective behaviors, because it is more comprehensive and coherent. Essentially, PMT proposes that protection behavior is motivated by two parallel streams: threat appraisal and coping appraisal. *Threat appraisal* is formed by summing factors increasing the likelihood of a protective response – perceived *vulnerability to* and *severity of* the health threat (in this case, breast cancer), minus those factors that decrease the probability of a protective response – intrinsic and extrinsic *rewards* (in this case, avoiding the side effects of SERMs). *Coping appraisal* is formed by summing appraisals of *self-efficacy* (one's perceived ability to actually carry out the protective behavior) and *response efficacy* (the belief that the protective behavior will work) less any *costs* (e.g. monetary, time, personal) associated with undertaking the protective behavior [20].

PMT includes the important construct of *self-efficacy* (the belief that one is capable of performing a behavior), present in neither the HBM nor TPB. TPB measures perceived behavioral control, a similar construct, but this has received less meta-analytical support as a predictor of both intentions and behaviors than self-efficacy [24]. PMT also includes components of threat perception (*perceived severity and perceived susceptibility*) (lacking in TPB) and perceived-efficacy of the adaptive health behavior and intention to perform a health behavior (*response-efficacy* and *protection-motivation*) (lacking in HBM). Further, the PMT posits clear relationships between its components, while the HBM is often criticized for being organized as a catalog of variables contributing to a behavior; thus the model provides no detail regarding the relationships between its constructs [25]. Thus the PMT was chosen to guide measure selection for the current study. To our knowledge no study to date has utilized PMT, or any other theoretical models, to increase understanding of decision-making about SERMs.

The amount of protection motivation elicited is a function of the threat and coping appraisal processes. Essential to PMT is the postulation that the incentive to protect oneself from danger is a positive linear function of severity, vulnerability, response efficacy and self-efficacy and a negative linear function of rewards and response costs [20].

The present study aimed to test whether PMT factors are associated with intention to take SERMs in women who have a moderate to high risk of breast cancer (see Fig. 1). Consistent with

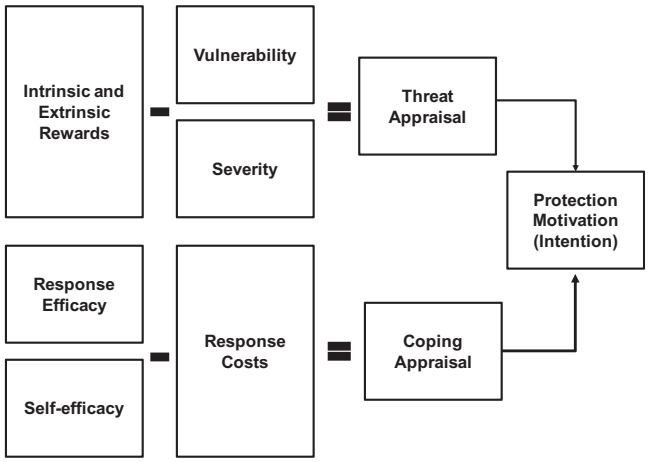

Fig. 1. A schema outlining the cognitive mediating processes of protection motivation theory.

Roger's [20] postulation of PMT, it was predicted that low rewards, high perceived vulnerability, high severity, high response efficacy, high self-efficacy and low response costs would be associated with intention to take SERMs. Further, in accordance with previous meta-analyses [26,27] of PMT assessing health-related intentions, it was predicted that coping appraisal would be more strongly associated with intention than threat appraisal.

2. Methods

2.1. Participants

Participants were recruited from two Familial Cancer Clinics in Australia. Eligibility criteria included that participants be: considered by their Familial Cancer Centre clinician to be at moderate or high risk of breast cancer, competent in English, between the ages of 18 and 70 and unaffected with breast or ovarian cancer. Women who had undergone bilateral mastectomy or tested negative for a documented *BRCA1* or *BRCA2* family mutation were excluded. Participants who had previously undergone a risk-reducing oophorectomy were not excluded, as their remaining risk still made SERMs a viable option. Clinician estimates of risk were based on family history and *BRCA1* and *BRCA2* mutation status, using the definition formulated by The Australian National Breast and Ovarian Cancer Centre: high risk is greater than three times the population risk and moderate risk is one and a half to three times population risk [28].

2.2. Procedure

Consecutive potentially eligible women were identified by each participating clinic from breast cancer risk assessment and high risk clinics. Clinicians sent women a letter advising them about the study with a 'permission to contact' form and a stamped, addressed return envelope. Women who gave permission were phoned by a researcher. Consenting women completed a web-based consent form and questionnaire. Those who preferred not to complete the questionnaire online, were mailed a paper-based questionnaire and consent form, with a stamped and addressed return envelope enclosed.

2.3. Materials

A fact sheet that provided information on SERMs, risk-reducing mastectomy and risk-reducing salpingo oophorectomy was