



Patient education

Promoting mammography screening among Chinese American women using a message-framing intervention

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ARTICLE INFO

Article history:

Received 9 November 2014

Received in revised form 12 March 2015

Accepted 21 March 2015

Keywords:

Mammography
Health disparities
Message framing
Decisional balance
Persuasion

ABSTRACT

Objectives: This study examined the role of women's perceptions about the relative pros versus cons (decisional balance) of mammography in moderating Chinese American women's responses to gain- and loss-framed messages that promote mammography.

Methods: One hundred and forty-three Chinese American women who were currently nonadherent to guidelines for receiving annual screening mammograms were randomly assigned to read either a gain- or loss-framed culturally appropriate print brochure about mammography screening. Mammography screening was self-reported at a 2-month follow-up.

Results: Although there was not a main effect for message frame, the hypothesized interaction between message frame and decisional balance was significant, indicating that women who received a framed message that matched their decisional balance were significantly more likely to have obtained a mammogram by the follow-up than women who received a mismatched message.

Conclusions: Results suggest that decisional balance, and more generally, perceptions about mammography, may be an important moderator of framing effects for mammography among Chinese American women.

Practice implications: The match between message frame and decisional balance should be considered when attempting to encourage Chinese American women to receive mammography screening, as a match between the two may be most persuasive.

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1. Introduction

Chinese Americans are the largest Asian American and Pacific Islander subpopulation and the fastest growing minority group in the United States [1]. Breast cancer is the most commonly diagnosed cancer and the second most common cause of cancer death among Chinese American women (CAW) [2]. Although CAW have a lower incidence rate of breast cancer relative to non-Hispanic White women, CAW have had a higher annual increase in incidence [3], and their breast cancer incidence and mortality risks increase the longer they reside in the US [4–6]. Furthermore, Asian

American women are more likely to be diagnosed at a later cancer stage, have more affected lymph nodes, and have larger tumors than non-Hispanic White women [7,8].

In addition to racial differences in the biological features of breast cancer, these discrepancies may be due to a lack of timely screening [8,9]. Although mammography screening is limited by its false positive rate and risk of overdiagnosis [10], it is considered the most effective breast cancer early detection method [11]. However, the screening rate of Asian American women, and CAW more specifically, is below the 81.1% screening mammography goal of Healthy People 2020 [12]. Asian American women have lower rates of screening relative to non-Hispanic White women, with 62% and 67% having had a mammogram in the prior two years, respectively [13]. Of CAW in New York City, only 54% had received a mammogram in the prior two years [14]. These lower rates suggest that CAW may benefit from interventions to improve screening adherence.

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Studies suggest that the lower rates of screening mammography among CAW are associated with their unique beliefs [14–16]. Factors influencing CAW's rates include those relevant to other racial and ethnic groups, such as physician recommendation and English proficiency [14–18]. In addition, some factors are perceived as more important for screening by CAW, relative to other racial and ethnic groups, such as trouble making appointments and taking time off work, while some factors are unique barriers for CAW, such as a preference for a Chinese-speaking physician [19,20]. Culturally appropriate interventions designed to increase mammography adherence among CAW have shown some success in increasing mammography use among nonadherent women [21–23]. For example, Wu and Lin [21] compared an individually-tailored telephone counseling intervention and a control condition in a sample of nonadherent CAW. Results showed that the intervention was more effective in increasing mammography use at 4 months among women who were 65 years or older, had health insurance, or had lived in the USA for 10 years or less.

Message framing is a theoretically driven approach to developing interventions to increase mammography screening. Prospect Theory posits that the way information is framed influences decisions [24]. Information can be presented as gain-framed, whereby the benefits of taking an action are emphasized, or loss-framed, whereby the costs of failing to take action are emphasized [25]. Loss-framed messages are assumed to be persuasive for behaviors that have probabilistic or uncertain outcomes (e.g., discovering an illness), whereas gain-framed messages are persuasive for behaviors perceived as having more certain outcomes [26,27]. The perceived certainty of an outcome is linked to the function of the health behavior such that illness detection behaviors (e.g., mammography) *tend* to be perceived as less certain, or more risky, than prevention behaviors (e.g., sunscreen use) because there is the immediate threat of the discovery of a health problem [26]. In turn, because detection behaviors can be perceived as risky, loss-framed messages are expected to be more effective.

In general, breast cancer screening interventions using message framing have shown loss-framed messages to be more effective than gain-framed messages [28–31]. The advantage of a loss-framed message for detection behaviors is contingent, however, upon the assumption that the behavior is perceived as risky in that it confers some chance of unpleasant consequences. Therefore, researchers have begun to examine for whom loss- and gain-framed messages are most effective, given that individuals will vary in their perception of the risks associated with mammography [29,32–35]. For example, Gallagher and colleagues [29] found an interaction such that women with average and higher perceived risks associated with mammography, as measured by the cons of screening [36], were significantly more likely to have a mammogram if they viewed a loss-framed, relative to a gain-framed, video. However, loss-framed and gain-framed messages were equally effective for women with low perceived risks, suggesting that low perceived risks alone do not promote the effectiveness of a gain-framed message and that women's perceptions of the benefits of screening may also be important in moderating frame. This study supports the idea that, to the extent that women differ in their perception of the riskiness of mammography, gain- and loss-framed messages may be differentially effective [26]. For instance, if women weigh the risks more heavily than the benefits of screening, a loss-framed message may be more effective. In contrast, if women weigh the risks more heavily than the benefits of screening, a gain-framed message may be more effective.

One potential measure of how CAW weigh the risks and benefits associated with mammography is decisional balance [29], a summary index from the Transtheoretical Model derived from two variables, pros and cons [37–39]. Pros refer to the positive

features of the target behavior (e.g., mammography can find breast lumps early), whereas cons refer to the negative features of the target behavior (e.g., mammography is embarrassing) [36]. Decisional balance is calculated by subtracting the total pros score from the total cons score. For the purposes of this study, a positive decisional balance score suggests that mammography is perceived as less risky, and a negative decisional balance suggests that it is perceived as more risky.

To our knowledge, a message framing intervention examining a moderator of the framing effect for mammography use among CAW has not been conducted. Thus, the purpose of the current project was to develop and evaluate a culturally targeted, theoretically driven message framing intervention to promote screening mammography among non-adherent CAW. We examined whether culturally appropriate gain- vs. loss-framed messages were differentially effective for women based on their perceptions of mammography, using decisional balance. It was expected that a match between decisional balance and message frame would be more effective in improving mammography adherence. We predicted that women with a negative decisional balance who received the loss-framed message and women with a positive decisional balance who received the gain-framed message would be more likely to receive a mammogram by 2-month follow-up than women who received mismatched messages.

2. Methods

CAW ($N = 143$) were recruited in the New York City metropolitan area in Spring 2009. Women were eligible for the study if they self-identified as Chinese, had not had a mammogram in the last 12 months, were 40 years of age or older, and were able to read either English or simplified or traditional Chinese characters. At the time of data collection, the American Cancer Society (ACS) [40] recommended annual mammograms for women aged 40 years and older. The participating university's institutional review board approved the project.

Participants met with bilingual Chinese- and English-speaking researchers at a local meeting place and provided informed consent, completed the baseline measures, and were randomized to receive either a gain- or a loss-framed brochure. Women could choose to read the brochure in English or simplified or traditional Chinese. The brochures were designed to be appropriate for a 5th-grade reading level. Two weeks later, participants received a telephone call from a trained research assistant to answer questions related to the print materials. Two months after baseline, women received the follow-up questionnaires by mail and were asked whether they had obtained a mammogram in the past 2 months. Women were compensated \$60 for their participation.

2.1. Measures

Demographic characteristics, including age, years in the USA, education, income, English language proficiency, breast cancer family history, previous mammograms, and health insurance status, were assessed using single items. The Decisional Balance Scale [36,39], which has been shown to be valid and reliable in Chinese [38], was modified by adding items from the Chinese Mammogram Screening Belief Questionnaire (CMSBQ) [41], which was developed for CAW and has also been shown to be valid and reliable in Chinese. The pros subscale (eight items) asked about potentially positive consequences, such as early detection of breast cancer ($\alpha = .78$). The cons subscale (10 items) asked about unpleasant consequences, such as embarrassment ($\alpha = .73$). Answers were given on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). In line with past research [37–39], the pro and con scores were standardized to T scores, with a mean of

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