

Age Differences in Treatment Decision Making for Breast Cancer in a Sample of Healthy Women: The Effects of Body Image and Risk Framing

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Purpose/Objectives: To examine the effects of age, body image, and risk framing on treatment decision making for breast cancer using a healthy population.

Design: An experimental 2 (younger women, older women) X 2 (survival, mortality frame) between-groups design.

Setting: Midwestern university.

Sample: Two groups of healthy women: 56 women ages 18–24 from undergraduate psychology courses and 60 women ages 35–60 from the university community.

Methods: Healthy women imagined that they had been diagnosed with breast cancer and received information regarding lumpectomy versus mastectomy and recurrence rates. Participants indicated whether they would choose lumpectomy or mastectomy and why.

Main Research Variables: Age, framing condition, treatment choice, body image, and reasons for treatment decision.

Findings: The difference in treatment selection between younger and older women was mediated by concern for appearance. No main effect for risk framing was found; however, older women were somewhat less likely to select lumpectomy when given a mortality frame.

Conclusions: Age, mediated by body image, influences treatment selection of lumpectomy versus mastectomy. Framing has no direct effect on treatment decisions, but younger and older women may be affected by risk information differently.

Implications for Nursing: Nurses should provide women who recently have been diagnosed with breast cancer with age-appropriate information regarding treatment alternatives to ensure women's active participation in the decision-making process. Women who have different levels of investment in body image also may have different concerns about treatment, and healthcare professionals should be alert to and empathetic of such concerns.

Breast cancer is the most frequently diagnosed cancer among women, with 211,240 new cases (32% of all female cancer diagnoses) expected in 2005 (American Cancer Society, 2005). Although the incidence of breast cancer is increasing, mortality rates are not. Improvements in available treatments allow patients with breast cancer to survive disease-free for many years after diagnosis. In early-stage breast cancer, lumpectomy combined with radiation results in equal disease-free survival time when compared to mastectomy (Early Breast Cancer Trialists' Collaborative Group, 1995; Fisher et al., 1995; Jacobson et al., 1995). Furthermore, lumpectomy may have significant psychological benefits, resulting in less anxiety and depression and fewer sexual problems (Andersen & Jochimsen, 1985; Beckmann,

Key Points . . .

- ▶ Younger women may be more likely to choose lumpectomy treatment than older women with early-stage breast cancer.
- ▶ Communication of risk information may influence the treatment choices women make by emphasizing the negative or positive aspects of each treatment.
- ▶ Learning more about patient variables and risk communication that affect treatment choices may assist nurses to help women make the most beneficial choices for them.

Johansen, Richardt, & Blichert-Toft, 1983; Kemeny, Wellisch, & Schain, 1988; Margolis, Goodman, & Rubin, 1990; McCaul, Hughson, & McCaul, 1990).

Studies also have revealed that lumpectomy and mastectomy procedures have different effects on body image. Mastectomy patients have significantly worse body image than lumpectomy patients, including less satisfaction with breast appearance, texture, and general appearance and feelings of reduced attractiveness after treatment (Kemeny et al., 1988; Lasry et al., 1987; Mock, 1993; Schain, d'Angelo, Dunn, Lichter, & Pierce, 1994). Studies also have found that patients who underwent mastectomy, with or without reconstruction, reported significantly more negative changes in body image than patients who underwent lumpectomy (Beckmann et al., 1983; Ganz, Rowland, Desmond, Meyerowitz, & Wyatt, 1998). Therefore, because of its functional, cosmetic, and psychological advantages, breast-conserving treatment currently is considered the treatment of choice in early-stage breast cancer.

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Despite the medical and psychological advantages of lumpectomy treatment, older women are more likely to undergo mastectomy than younger women. Repetto et al. (1997) reviewed the medical records of older women (≥ 70 years of age) with breast cancer and stage-matched younger (< 50 years of age) patients with breast cancer. The authors found that breast-conserving surgery was significantly more frequent in younger patients (71%) compared to older patients (26%), and radical mastectomy was significantly more frequent in older patients (34%) compared to younger patients (9%).

However, little systematic research has been conducted regarding age and treatment choice. Studies that found treatment differences tended to statistically control for the phenomenon rather than explore it. For example, in a study by Wellisch et al. (1989), the mean age of the lumpectomy group (45.9) was significantly lower than the mean age of the nonreconstructed mastectomy group (58.9). Goldberg et al. (1992) found a similar pattern, with the breast-conserved group averaging five years younger than the mastectomy group. Participants in the studies were not assigned randomly to treatment condition, which suggests that younger women in the studies selected breast-conserving treatment more often than older women did. However, neither of the studies specifically examined the age differences to determine whether decision motives for treatment differed.

Evidence regarding decision motives for treatment suggests that body image may play an important role in the selection of lumpectomy treatment. Studies on treatment decisions found that participants who chose mastectomy reported more fear of cancer recurrence, fewer body image concerns, and more radiation concerns; participants who chose lumpectomy reported more body image concerns, fear of loss of femininity, and doubts about handling mastectomy emotionally (Margolis, Goodman, Rubin, & Pajac, 1989; McVea, Minier, & Johnson Palensky, 2001; Morris & Ingham, 1988; Ward, Heidrich, & Wolberg, 1989). However, research that interferes with treatment decisions raises serious ethical concerns; therefore, most studies have been retrospective rather than prospective. In the only prospective study found during a literature search on treatment decisions, Ashcroft, Leinster, and Slade (1985) assessed concern for appearance preoperatively. Women who chose lumpectomy rated their concern for appearance higher than those who did not choose lumpectomy.

The effects of breast cancer treatment are likely to cause more body image and sexuality disruption than that experienced by healthy individuals or other patients with cancer because the part of the body being destroyed is significantly entwined with a sense of womanhood and femininity (Apfel, Love, Kalinowski, & Hansen, 1994; Kasper, 1995; Waldman & Eliasof, 1997). Women confront breast cancer in a social context that highly values women's appearances, leaving patients with breast cancer to reevaluate their own sense of identity and self-worth. The more symbolic the body part being lost to cancer is to a person, the more the person will experience a disturbance in self-esteem and self-concept (Katz, Rodin, & Devins, 1995). Understandably, for many women who place significant investment in their appearances, the diagnosis of breast cancer and its treatments will have a significant impact on their sense of body image and sexuality.

Body image traditionally is conceptualized as the mental image of the body and may involve many dimensions, such as a person's perception of his or her body, the way a person

thinks about his or her body, how a person presents his or her body to others, and a person's satisfaction with appearance (Price, 1998). Body image is an important part of a person's sense of self-esteem and self-concept, and a disturbance in body image may lead to lowered self-esteem and self-concept (Anderson & Johnson, 1994). Because breast cancer treatment violates the integrity of the body, patients likely will experience some degree of body image disturbance during and after treatment.

The literature on body image and body satisfaction leads to the development of a hypothesis that may explain why younger and older women choose different treatment options. Researchers interested in body image have tested women ages 18–80 and obtained consistent results despite the wide range of variables that affect body satisfaction and the numerous methods for exploring the construct. Studies have found that body image and self-esteem are important across all age groups; when researchers have compared current body conditions to desired body conditions, they have found that the differences are equivalent for women of different ages. However, despite the equivalent discrepancy in current versus ideal body condition, older women reported more body satisfaction overall than younger women (Franzoi & Koehler, 1998; Hetherington & Burnett, 1994), and older women had more body self-esteem than younger women (Paxton & Phythian, 1999). Therefore, the treatment decision differences between younger and older women may be related to differences among younger and older women in body image satisfaction and investment.

Another potentially important factor in the age difference of treatment decisions is the effects of healthcare professionals' recommendations and presentation of information on treatment decision making. In general, women have reported that recommendations of their healthcare providers are very important to their decisions, and they tended to choose the treatments recommended (Petrisek, Laliberte, Allen, & Mor, 1997; Siminoff & Fetting, 1991; Valanis & Rumpler, 1982). These findings indicate that healthcare professionals have considerable influence over the type of treatments patients choose; given that influence, healthcare professionals must consider the presentation of treatment information. Medical risk communication and recommendations typically have been studied in the context of framing risk information.

Research on information presentation for medical decision making has focused on the effects of framing on choice. In framing, information is presented in a way that emphasizes the gains or losses of a decision (Tversky & Kahneman, 1981). Gain framing presents a choice in terms of potential survival or successes (e.g., "With option A, 50 people out of 100 will be saved."), whereas loss framing presents a choice in terms of potential mortality or failures (e.g., "With option A, 50 people out of 100 will die."). Medical framing research mostly has focused on the modification of risky behavior (e.g., smoking) or the increase of healthy behaviors (e.g., mammography); however, clinically applied research, such as treatment decision making for diseases, is more sparse (Edwards, Elwyn, Covey, Matthews, & Pill, 2001). The few studies that have addressed treatment decision making show that treatment preferences change as a function of the presented frame (Gurm & Litaker, 2000; McNeil, Pauker, & Tversky, 1988). Specifically, individuals are more likely to choose a procedure when its risks are framed in terms of gains rather than losses.

Framing may serve as a priming mechanism for subsequent risk information; therefore, mortality frames would prime a participant for negative evaluation of the information, and survival frames would do the opposite.

However, despite the abundance of research on the framing of medical information, research on the role of age in risk framing is nonexistent. Research regarding age differences in medical communication mostly has focused on differential qualitative preferences in communication. For example, older and younger women have been shown to have differential preferences in desired participation of treatment decisions and medical information (Petrisek et al., 1997). However, the question of whether age plays a role in framed perception of risk has yet to be explored. Younger and older woman may understand risk information differently, which, in turn, may contribute to differential treatment selections.

The purpose of the current study was to explore the breast cancer treatment decisions of younger and older women by examining the effects of body image and risk framing in a sample of healthy women. Healthy women were presented with a hypothetical breast cancer scenario to avoid the ethical concerns involved with purposefully attempting to influence the treatment decisions of actual patients with breast cancer. The hypotheses were

- If younger women are more influenced by body image concerns than older women, they should be more likely to choose lumpectomy treatment than older women.
- Concerns about body image and appearance should be related to treatment decisions, with women who are more concerned about the effects of breast surgery on body image choosing lumpectomy more often.
- Body image concerns are the mediating factor between age and treatment decisions; therefore, after accounting for body image concerns, age no longer should be a significant predictor of treatment decisions.
- Framing of risk information should affect decisions such that a gain (survival) frame would minimize recurrence concerns, leading women to choose lumpectomy more often, and a loss (mortality) frame would enhance recurrence concerns, leading women to choose mastectomy more often.

Lastly, the study explored the potential differential effects of framing risk information on treatment decisions between younger and older women.

Methods

Sample and Setting

The sample consisted of two healthy, nonrandomized groups of women, none of whom had a personal history of breast cancer. The younger age group included 56 women ages 18–24 who were recruited from undergraduate psychology courses. Younger women volunteered on a sign-up sheet posted near the psychology department office, and they received extra credit toward their class grades. One participant from the younger age group was excluded from all further analyses because she answered six of the eight information check questions incorrectly. The older age group included 60 women ages 35–60 who were recruited through university advertising. The advertisements requested women with no personal history of breast cancer (family history was acceptable), ages 35 and older, for participation in a research

study on breast cancer decision making. They received \$10 for participating. All participants met in the laboratory at the university, but the younger and older adult samples did not meet together.

Procedure

The study employed a 2 (age group) X 2 (framing information) between-groups design. Individuals were assigned randomly to a framing condition. All participants received the same information regarding the stage of cancer, operations and procedures for each treatment, and information regarding the costs and benefits of each treatment. Risk information was presented in either a survival (gain) or mortality (loss) frame. The dependent variables were the patient's treatment choice and the reported reasons for that decision.

Participants met in groups of two to four and first were given a brief description of the study. The researcher asked the participants to imagine that they had been diagnosed with breast cancer and would be making a decision about treatment. After providing informed written consent, participants completed the pretest measures.

Participants were asked to imagine that two days earlier they were diagnosed with stage I breast cancer and that they were meeting with a physician to hear about treatment options. Participants were informed that before viewing a video about surgery they would listen to an informal presentation on their specific breast cancer and the treatment options available. The researcher explained cancer staging and introduced the two treatment options: lumpectomy with radiation or mastectomy. The researcher emphasized that both treatment options offered equivalent survival time outcomes.

Participants then were randomly assigned to view one of two videos containing either the survival or mortality frame. They were separated to view the video individually. Both videos were approximately six minutes in length and featured a physician who explained the procedures of each treatment, stated that both treatments offered the same survival outcome, and presented the risk information. The survival frame stated, "If you choose lumpectomy plus radiation treatment, there is a 95% chance of survival after five years. That means, out of 100 women who have a lumpectomy in stage I breast cancer, 95 will still be alive five years from now." The mortality frame stated, "If you choose lumpectomy plus radiation treatment, there is a 5% chance of death within five years. That means, out of 100 women who have a lumpectomy in stage I breast cancer, 5 will die within five years."

After viewing the video, participants were given a written summary detailing important information about each treatment and the probable outcome information in either the survival or mortality frame. Women read the summary and then completed the post-test measures. Measurements were collected, and the participants were debriefed.

Measurements

Items on the pretest were designed specifically for this study and asked about participants' demographic backgrounds, including cancer history. Post-test measurements also were designed specifically for this study and assessed which treatment participants chose and why. Participants indicated their choices by marking a point on a horizontal line that had end points labeled "absolutely certain I would choose a mastectomy" and "absolutely certain I would choose a lumpectomy." Responses

later were converted to an 11-point scale (–5 to +5). For ease of presentation and to make the measurement more clinically valid, the authors recoded the scale into a dichotomous decision of lumpectomy or mastectomy. Scores less than 0 were used to indicate lumpectomy; those higher indicated mastectomy (no participants scored exactly at the neutral midpoint).

Based on previous literature, eight possible explanations for participants’ choices then were provided, and women rated whether each factor influenced their decisions (1 = not at all important to 10 = extremely important). Factors assessed included physical appearance, possible side effects of radiation, effects on sexuality, time commitment of radiation, ability to function, preservation of the breast, rate of survival, and fear of death. To assess whether the participants comprehended the information, they answered eight questions concerning the presentation and video. Participants indicated what stage they had been diagnosed and answered three multiple-choice questions on the difference between lumpectomy and mastectomy, which treatment would be followed with radiation, and how long a woman could expect to go through radiation. In addition, four questions assessed participants’ understanding of the risk statistics for each treatment.

Results

Sample

Table 1 shows the demographic data for the two age groups in the study. The average ages of the younger and older groups were 19.4 and 46.5 years, respectively. A majority of both age groups was Caucasian and highly educated. Most of the younger women (84%) were freshmen or sophomores in college, and the education levels of the older women ranged from 12–20 years (\bar{X} = 15.13). Most of the younger women (82%) were single, whereas most of the older women (68%) were married. Thirty-five (63%) younger women reported having no family history of breast cancer, and 21 (38%) reported having some family history, three of whom reported a first-degree relative with breast cancer. Thirty (50%) older

Table 1. Demographic Information

| Variable | Age Group | | | |
|---------------------------------|------------------|----|----------------|----|
| | Younger (n = 56) | | Older (n = 60) | |
| Age (years) | | | | |
| \bar{X} | 19.36 | | 46.47 | |
| Range | 18–24 | | 35–60 | |
| Education (\bar{X} years) | 13.57 | | 15.13 | |
| Variable | n | % | n | % |
| Ethnicity | | | | |
| Caucasian | 54 | 96 | 59 | 98 |
| Other | 2 | 4 | 1 | 2 |
| Marital status | | | | |
| Married | 2 | 4 | 41 | 68 |
| Single | 46 | 82 | 7 | 12 |
| Committed relationship | 8 | 14 | 3 | 5 |
| Divorced | – | – | 7 | 12 |
| Widowed | – | – | 2 | 3 |
| Family history of breast cancer | 21 | 38 | 30 | 50 |

women reported having no family history of breast cancer, and 30 (50%) reported having some family history, 11 of whom reported a first-degree relative with breast cancer. Family history of breast cancer was unrelated to treatment decision, although women with a family history (67%) were somewhat less likely to select lumpectomy than those without a family history (79%).

Treatment Decisions

Two chi-square tests were conducted to compare the lumpectomy versus mastectomy decisions. Overall, most participants (74%) selected breast-conserving treatment. However, Table 2 shows that, as predicted, younger women (82%) chose lumpectomy more often than older women (66%) (Fisher’s exact test [df = 1] p = 0.05, one tailed). In contrast to predictions, women in the survival framing condition (76%) did not differ in their choice from women in the mortality framing condition (72%) (Fisher’s exact test [df = 1] p = 0.39, one tailed). However, the difference between younger and older women appeared especially pronounced for the mortality frame: older women appeared least likely to choose lumpectomy when they heard the mortality frame. This pattern of treatment choices suggested an interaction, such that older women in the mortality framing condition were less likely to choose lumpectomy than younger women who heard that frame. This possible interaction was tested using logistic regression, but it was not significant (χ^2 [df = 1] = 1.39, p = 0.24, two tailed).

Women rated the importance of eight factors as influences on their decisions. Table 3 presents those data. In terms of overall means, participants said that survival rates (\bar{X} = 8.22), fear of death (\bar{X} = 6.79), preservation of the breast (\bar{X} = 5.92), ability to function (\bar{X} = 5.85), and physical appearance (\bar{X} = 5.06) were the most important factors in their decisions. A 2 (age) X 2 (framing) analysis of variance revealed that younger women (\bar{X} = 6.06) rated physical appearance to be more important in their decisions than older women did (\bar{X} = 4.15) (F [1, 109] = 10.14, p = 0.002). Younger women (\bar{X} = 5.54) also rated possible effects on sexuality to be more important than older women did (\bar{X} = 4.27) (F [1,109] = 3.95, p = 0.049), and they rated preservation of the breast (\bar{X} = 7.06) to be more important than older women did (\bar{X} = 4.88) (F [1,109] = 12.01, p = 0.001).

The framing condition had a significant effect on only one treatment factor: the importance of the rate of survival. As Table 3 shows, participants in the survival framing condition (\bar{X} = 8.75) rated survival rates as more important to them than did participants in the mortality framing condition (\bar{X} = 7.68) (F [1,111] = 5.22, p = 0.02).

Table 4 presents the data regarding the reasons for selecting treatment, categorized separately for women who

Table 2. Percentage of Women in Each Age Group and Framing Condition Who Chose Lumpectomy Treatment

| Framing Condition | Age Group | |
|-------------------|----------------|----------------|
| | Younger | Older |
| Survival | 79% (22 of 28) | 73% (22 of 30) |
| Mortality | 85% (23 of 27) | 60% (18 of 30) |

Table 3. Reasons for Selecting Treatment for Women in Each Age and Framing Group

| Framing Condition | Younger Group | | Older Group | |
|-------------------------------|---------------------|----------------------|---------------------|----------------------|
| | Survival X̄ (SD) | Mortality X̄ (SD) | Survival X̄ (SD) | Mortality X̄ (SD) |
| Rate of survival | 8.41 (1.58) | 7.76 (2.83) | 9.07 (1.98) | 7.69 (3.13) |
| Fear of death | 6.70 (2.89) | 6.58 (3.15) | 7.67 (2.84) | 6.17 (3.60) |
| Preservation of the breast | 6.44 (3.30) | 7.67 (2.57) | 5.00 (3.47) | 4.76 (3.81) |
| Ability to function | 5.00 (2.59) | 6.07 (2.93) | 6.50 (2.78) | 5.76 (3.33) |
| Physical appearance | 5.85 (2.66) | 6.26 (3.13) | 4.17 (3.50) | 4.14 (3.29) |
| Effects on sexuality | 5.48 (3.18) | 5.59 (3.05) | 4.10 (3.58) | 4.45 (3.60) |
| Side effects of radiation | 4.44 (2.74) | 4.89 (2.72) | 4.79 (2.87) | 4.62 (3.27) |
| Time commitment for radiation | 4.00 (3.55) | 2.70 (2.93) | 2.63 (2.79) | 2.62 (3.45) |

chose lumpectomy versus women who chose mastectomy. An analysis of variance revealed that women who chose lumpectomy rated preservation of the breast, ability to function, physical appearance, and possible effects on sexuality as more important in their decisions than did women who chose mastectomy. Women who chose mastectomy rated the side effects of radiation and the time commitment of radiation to be more important in their decisions than did women who chose lumpectomy. Women who chose lumpectomy or mastectomy did not differ in their ratings of the importance of survival or fear of death.

Mediational Analyses

The authors hypothesized that body image would serve as a mediating variable for treatment choice. To test the prediction, logistic regression was used. When entered alone, both age ($\chi^2_{\text{wald}} = 3.33, p = 0.034$) and physical appearance ($\chi^2_{\text{wald}} = 24.38, p < 0.001$) were significant predictors of treatment decision. However, when entered in a stepwise method, with physical appearance entered first, age failed to predict treatment decision ($p = 0.9$). This finding supports the prediction that appearance concerns mediate treatment decisions.

Table 4. Treatment Factors for Women Who Chose Lumpectomy Versus Mastectomy

| Treatment Factor | Lumpectomy | Mastectomy |
|--------------------------------|-------------|-------------|
| | X̄ (SD) | X̄ (SD) |
| Rate of survival | 8.01 (2.61) | 8.83 (2.50) |
| Fear of death | 6.49 (3.16) | 7.66 (2.98) |
| Preservation of the breast** | 7.27 (2.73) | 2.00 (2.31) |
| Ability to function* | 6.23 (2.91) | 4.76 (2.79) |
| Physical appearance** | 6.04 (2.96) | 2.24 (2.42) |
| Effects on sexuality** | 5.45 (3.26) | 3.21 (3.26) |
| Side effects of radiation** | 4.16 (2.54) | 6.21 (3.28) |
| Time commitment of radiation** | 2.35 (2.77) | 4.79 (3.69) |

* $p < 0.05$
** $p < 0.01$

Three additional measurements, which for reasons of brevity are not described in this article, were collected. Two of them failed to reveal between-groups differences: (a) a post-test anxiety scale and (b) a 10-point (rather than dichotomous) measurement of treatment preference. The third measurement was open-ended, and it asked women to supply explanations for their treatment preferences. The open-ended question was asked prior to the listed explanations. The data from the latter measure closely followed the scaled explanations reported in the text. Interested readers may obtain the additional data from the first author.

Discussion

Most women in the study chose lumpectomy, which is consistent with the treatment recommended for patients with stage I breast cancer. However, younger women were significantly more likely than older women to choose lumpectomy treatment. Although the age differences are consistent with previous findings (Goldberg et al., 1992; Moyer, 1997; Wellisch et al., 1989), most previous research has treated age as a confounding variable. In contrast, the current study hypothesized that age differences occur for a particular reason—differences in the importance of body image and the evaluation of risk information.

Previous research has shown that younger and older women have different concerns regarding body image. Therefore, the authors hypothesized that the differential concerns would lead to women making decisions based on their investments in physical appearance. The data showed that age was significantly related to several different reasons for treatment choices. Specifically, younger women reported that preservation of the breast, physical appearance, and sexuality were important factors in their decisions. Similarly, and regardless of age, women who chose lumpectomy also believed that preservation of the breast, physical appearance, and sexuality were the most important factors in their decisions. Most notably, logistic regression analyses showed that age failed to predict treatment choice after accounting for the importance of physical appearance in the women’s decisions. The statistical analysis indicates that physical appearance mediates the effects of age on treatment choice, and it strongly supports the hypothesis that younger women select lumpectomy treatment more often because they are more concerned about their appearances than older women are. As far as the authors are aware, the current study is the first to demonstrate statistically that appearance concerns mediate age differences in treatment choice.

The authors also hypothesized that risk perception would play an important role in treatment decision making. Although the success rates for lumpectomy and mastectomy treatment are equivalent, women still may perceive lumpectomy to be a riskier option because less breast tissue, and possibly less cancer tissue, is removed. The current study predicted that presenting treatment information in a survival frame would minimize recurrence concerns and lead women to choose lumpectomy; a mortality frame should have done the opposite. However, a significant main effect of framing failed to emerge.

The literature on the framing of medical information for treatment decisions is not as consistent as framing risk for risky or screening behaviors. For example, in a study assessing the effects of framing on influenza immunization, O’Connor,

Pennie, and Dales (1996) failed to prove a significant effect. The framing manipulation in the current study was different than the typical manipulation used in medical framing studies. Like the current study, most studies on framing are hypothetical; however, in most studies, patients are offered limited information regarding other aspects of the treatment. In comparison, to more closely resemble the information an actual patient receives, the current study provided participants with a great deal of information regarding cancer staging, the procedural processes of each treatment, and potential risks and benefits of each treatment. In a meta-analysis on framing, Edwards et al. (2001) found that framing effects varied with the amount of information presented. Therefore, the amount of information provided to participants in the current study may have diluted the framing message.

One trend in the data should prompt additional research. Specifically, in the mortality condition, older women were somewhat less likely to choose lumpectomy treatment than younger women were. Although it did not reach statistical significance, this pattern suggests that older women might be more influenced by framing than younger women. As stated previously, age difference in framing is an area that has been researched poorly. Thus, it could be an important avenue for future research.

Limitations

The results of the study must be considered in the context of several limitations. The most important limitation concerns the samples. The younger age group consisted of college students, much younger than women who are likely to be diagnosed with breast cancer and much more likely to be concerned with body image. Moreover, the average age of the “older” sample was 46, which would place the group at the younger end of the continuum for the majority of women who actually are diagnosed with breast cancer. In short, making confident generalizations to younger and older age groups of women diagnosed with breast cancer would go well beyond the data. That said, the study found support for a specific theoretical position: that hypothetical breast cancer decisions differ by age and that the differences are mediated (caused) by differences in body image investment. Theoretically, the age differences observed in actual treatment decisions also may be mediated by body image. Such a hypothesis awaits future empirical testing.

A second limitation of the study is that participants were role playing, so they likely did not experience the same degree of thoughts and emotions that actual patients with breast cancer experience. Women who are asked to imagine that they have been diagnosed with breast cancer may make different decisions than women who actually are diagnosed with breast cancer. And although the authors consulted with medical professionals, the information presented to the groups may not reflect accurately the manner, content, and timing of information that patients would receive in actual clinical interactions. In short, generalizing to women who actually are facing treatment is risky. In addition, because the participants were not making “real” decisions, the validity of the measurements is an open question. In particular, the questions about why women made their choices were intended to capture most, if not all, possible explanations, but the authors do not have psychometric evidence demonstrating the validity of the items.

A number of other limitations exist related to the sample. The sample size, for example, was relatively small for detecting dichotomous outcomes. Lack of power may partly explain why the framing effect was not significant. Moreover, the women in the study were not sampled randomly; instead, they volunteered and received compensation for their time. Perhaps the majority of women who participated did so because they were especially interested in the topic of breast cancer. Those especially interested might have been women who have had family members develop breast cancer. However, family history of breast cancer was unrelated to treatment decision or to the reasons for their decisions. One other limitation of the sample is that the women were well educated, with the majority having some college education. Level of education could have played a role in treatment decisions. Perhaps, for example, more educated women better understood the probability data concerning the two treatments and, thus, were more likely to choose lumpectomy.

Although the authors acknowledge the sample and design limitations, two types of evidence are encouraging about the potential for the results of this data to be generalized. First, the results of the hypothetical breast cancer treatment decisions mapped closely onto what typically is observed when decisions are made in the “real world.” For example, the lumpectomy decision rates in the current study were comparable to those found in studies using populations with breast cancer (Hughes, 1993; Levy et al., 1992; Mock, 1993; Morris & Ingham, 1988; Reaby, 1998; Schover et al., 1995).

Second, qualitative evidence suggests that participants were making their decisions in similar ways as women who have been diagnosed with breast cancer. For example, responses on open-ended questions suggest that women were taking the study seriously. Some women indicated that imagining themselves in such a position was easy, and others stated that participating was thought provoking and emotional. Sample comments include: “It’s been very interesting. I was surprised to see how it affected me emotionally just pretending like this.” “Most women probably came into the study with a thought already in their heads about what they would do in this situation, and I think as women age they think about it more.” “Being faced with this decision out of the blue was very thought provoking.” Therefore, although sample and design weaknesses obviously limit generalizability, evidence suggests that the current study has the potential to reveal important factors in women’s treatment decisions.

Implications for Nursing

Discussing the risks and benefits of various breast cancer treatments is vital in the changing healthcare system, and nurses increasingly are playing a substantial role in the dissemination of treatment information and recommendations. Despite its limitations, the current study offers interesting and important findings regarding how patients with breast cancer may make their decisions. Nurses should provide patients recently diagnosed with breast cancer with age-appropriate information regarding treatment alternatives to ensure women’s active participation in the decision-making process.

The study found that younger and older women have differential concerns when deciding on treatment, and the differential concerns may have important implications for

what particular issues nurses should address and emphasize when discussing treatment options. Knowing the differential concerns and communication styles between younger and older women will assist nurses in communicating information that is most important to their decisions. A younger woman diagnosed with breast cancer may have more investment in preserving her appearance than an older patient would have, and the nurse should address the importance of preserving the breast and physical appearance with the patient directly. Direct communication with the patient regarding her reasons for wanting either treatment would assist in improving quality of life by ensuring that the treatment selected is the best emotionally and medically for the patient.

Lastly, nurses must be aware of how information affects different patient populations. Nurses should be sure to present risk information so that risks are understood from survival and mortality points of view. The study indicates that older women may be more likely than younger women to be influenced by mortality frames. Nurses should take special care to ensure that older patients understand risk information by presenting the information in survival and mortality frames. Giving a mixed frame should ensure that patients understand the information without giving the risk information more or less weight.

Clearly, more research is needed in the area of age differences in breast cancer decisions. The current study found that hypothetical breast cancer decisions differ by age and that the differences are mediated (caused) by differences in body image investment. The findings reasonably suggest a hypothesis that the age differences observed in actual treatment decisions also may be mediated by body image. However, such mediation needs empirical testing using more representative samples.

Furthermore, age differences in perception of risk communication constitute an area worthy of future research. The current study suggests that the way risk information is presented may affect how women of different age groups perceive and use information when making decisions. Younger and older women may respond to risk information differently depending on how it is presented. Future research in this area could help to improve the quality of medical communication and lead women to make more informed treatment choices.

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References

- American Cancer Society. (2005). *Cancer facts and figures 2005*. Atlanta, GA: Author.
- Andersen, B.L., & Jochimsen, P.R. (1985). Sexual functioning among breast cancer, gynecologic cancer, and healthy women. *Journal of Consulting and Clinical Psychology, 53*, 25–32.
- Anderson, M.S., & Johnson, J. (1994). Restoration of body image and self-esteem for women after cancer treatment: A rehabilitative strategy. *Cancer Practice, 2*, 345–349.
- Apfel, R., Love, S., Kalinowski, B., & Hansen, B. (1994). Keep abreast: Women and breast cancer in context. In M. Mirkin (Ed.), *Women in context: Toward a feminist reconstruction of psychotherapy* (pp. 217–236). New York: Guilford Press.
- Ashcroft, J.J., Leinster, S.J., & Slade, P.D. (1985). Breast cancer—Patient choice of treatment: Preliminary communication. *Journal of the Royal Society of Medicine, 78*, 43–46.
- Beckmann, J., Johansen, L., Richardt, C., & Blichert-Toft, M. (1983). Psychological reactions in younger women operated on for breast cancer. Amputation versus resection of the breast with special reference to body-image, sexual identity and sexual function. *Danish Medical Bulletin, 30*(Suppl. 2), 10–13.
- Early Breast Cancer Trialists' Collaborative Group. (1995). Effects of radiotherapy and surgery in early breast cancer: An overview of the randomized trials. *New England Journal of Medicine, 333*, 1444–1456.
- Edwards, A., Elwyn, G., Covey, J., Matthews, E., & Pill, R. (2001). Presenting risk information—A review of the effects of “framing” and other manipulations on patient outcomes. *Journal of Health Communication, 6*, 61–82.
- Fisher, B., Anderson, S., Redmond, C.K., Wolmark, N., Wickerham, D.L., & Cronin, W.M. (1995). Reanalysis and results after 12 years of follow-up in a randomized clinical trial comparing total mastectomy with lumpectomy with or without irradiation in the treatment of breast cancer. *New England Journal of Medicine, 333*, 1456–1461.
- Franzoi, S.L., & Koehler, V. (1998). Age and gender differences in body attitudes: A comparison of young and elderly adults. *International Journal of Aging and Human Development, 47*, 1–10.
- Ganz, P.A., Rowland, J., Desmond, K., Meyerowitz, B.E., & Wyatt, G.E. (1998). Life after breast cancer: Understanding women's health-related quality of life and sexual functioning. *Journal of Clinical Oncology, 16*, 501–514.
- Goldberg, J.A., Scott, R.N., Davidson, P.M., Murray, G.D., Stallard, S., George, W.D., et al. (1992). Psychological morbidity in the first year after breast surgery. *European Journal of Surgical Oncology, 18*, 327–331.
- Gurm, H.S., & Litaker, D.G. (2000). Framing procedural risks to patients: Is 99% safe the same as a risk of 1 in 100? *Academic Medicine, 75*, 840–842.
- Hetherington, M., & Burnett, L. (1994). Ageing and the pursuit of slimness: Dietary restraint and weight satisfaction in elderly women. *British Journal of Clinical Psychology, 33*, 391–400.
- Hughes, K.K. (1993). Decision making by patients with breast cancer: The role of information in treatment selection. *Oncology Nursing Forum, 20*, 623–628.
- Jacobson, J.A., Danforth, D.N., Cowan, K.H., d'Angelo, T., Steinberg, S.M., Pierce, L., et al. (1995). Ten-year results of a comparison of conservation with mastectomy in the treatment of stage I and stage II breast cancer. *New England Journal of Medicine, 332*, 907–911.
- Kasper, A.S. (1995). The social construction of breast loss and reconstruction. *Women's Health, 1*, 197–219.
- Katz, M.R., Rodin, G., & Devins, G.M. (1995). Self-esteem and cancer: Theory and research. *Canadian Journal of Psychiatry, 40*, 608–615.
- Kemeny, M.M., Wellisch, D.K., & Schain, W.S. (1988). Psychosocial outcome in a randomized surgical trial for treatment of primary breast cancer. *Cancer, 62*, 1231–1237.
- Lasry, J.C., Margolese, R.G., Poisson, R., Shibata, H., Fleischer, D., Lafleur, D., et al. (1987). Depression and body image following mastectomy and lumpectomy. *Journal of Chronic Diseases, 40*, 529–534.
- Levy, S.M., Haynes, L.T., Herberman, R.B., Lee, J., McFeeley, S., & Kirkwood, J. (1992). Mastectomy versus breast conservation surgery: Mental health effects at long-term follow-up. *Health Psychology, 11*, 349–354.
- Margolis, G., Goodman, R.L., & Rubin, A. (1990). Psychological effects of breast-conserving cancer treatment and mastectomy. *Psychosomatics, 31*, 33–39.
- Margolis, G.J., Goodman, R.L., Rubin, A., & Pajac, T.F. (1989). Psychological factors in the choice of treatment for breast cancer. *Psychosomatics, 30*, 192–197.
- McArdle, J.M., Hughson, A.V., & McArdle, C.S. (1990). Reduced psychological morbidity after breast conservation. *British Journal of Surgery, 77*, 1221–1223.

- McNeil, B., Pauker, S., & Tversky, A. (1988). On the framing of medical decisions. In D. Bell, H. Raiffa, & A. Tversky (Eds.), *Decision making: Descriptive, normative, and prescriptive interactions* (pp. 562–568). New York: Cambridge University Press.
- McVea, K.L., Minier, W.C., & Johnson Palensky, J.E. (2001). Low-income women with early-stage breast cancer: Physician and patient decision-making styles. *Psycho-Oncology*, 10, 137–146.
- Mock, V. (1993). Body image in women treated for breast cancer. *Nursing Research*, 42, 153–157.
- Morris, J., & Ingham, R. (1988). Choice of surgery for early breast cancer: Psychosocial considerations. *Social Science and Medicine*, 27, 1257–1262.
- Moyer, A. (1997). Psychosocial outcomes of breast-conserving surgery versus mastectomy: A meta-analytic review. *Health Psychology*, 16, 284–298.
- O'Connor, A.M., Pennie, R.A., & Dales, R.E. (1996). Framing effects on expectations, decisions, and side effects experienced: The case of influenza immunization. *Journal of Clinical Epidemiology*, 49, 1271–1276.
- Paxton, S., & Phythian, K. (1999). Body image, self-esteem, and health status in middle and later adulthood. *Australian Psychologist*, 34, 116–121.
- Petrisek, A.C., Laliberte, L.L., Allen, S.M., & Mor, V. (1997). The treatment decision-making process: Age differences in a sample of women recently diagnosed with nonrecurrent, early-stage breast cancer. *Gerontologist*, 37, 598–608.
- Price, B. (1998). Cancer: Altered body image. *Nursing Standard*, 12(21), 49–55.
- Reaby, L.L. (1998). The quality and coping patterns of women's decision-making regarding breast cancer surgery. *Psycho-Oncology*, 7, 252–262.
- Repetto, L., Costantini, M., Campora, E., Amoroso, D., Gianni, W., Catturich, A., et al. (1997). A retrospective comparison of detection and treatment of breast cancer in young and elderly patients. *Breast Cancer Research and Treatment*, 43, 27–31.
- Schain, W.S., d'Angelo, T.M., Dunn, M.E., Lichter, A.S., & Pierce, L.J. (1994). Mastectomy versus conservative surgery and radiation therapy: Psychosocial consequences. *Cancer*, 73, 1221–1228.
- Schover, L.R., Yetman, R.J., Tuason, L.J., Meisler, E., Esselstyn, C.B., Hermann, R.E., et al. (1995). Partial mastectomy and breast reconstruction. A comparison of their effects on psychosocial adjustment, body image, and sexuality. *Cancer*, 75, 54–64.
- Siminoff, L.A., & Fetting, J.H. (1991). Factors affecting treatment decisions for a life-threatening illness: The case of medical treatment of breast cancer. *Social Science and Medicine*, 32, 813–818.
- Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211, 453–458.
- Valanis, B., & Rimpler, C. (1982). Healthy women's preferences in breast cancer treatment. *Journal of the American Medical Women's Association*, 37, 311–316.
- Waldman, T., & Eliasof, B. (1997). Cancer. In M. Sipski & C. Alexander (Eds.), *Sexual functioning in people with disability and chronic illness: A health professional's guide* (pp. 337–354). Gaithersburg, MD: Aspen Publishers.
- Ward, S., Heidrich, S., & Wolberg, W. (1989). Factors women take into account when deciding upon type of surgery for breast cancer. *Cancer Nursing*, 12, 344–351.
- Wellisch, D.K., DiMatteo, R., Silverstein, M., Landsverk, J., Hoffman, R., Waisman, J., et al. (1989). Psychosocial outcomes of breast cancer therapies: Lumpectomy versus mastectomy. *Psychosomatics*, 30, 365–373. 