Internet Breast Health Information Use and Coping among Women with Breast Cancer

JOSHUA FOGEL, Ph.D.

ABSTRACT

The objective of this work was to study, among breast cancer patients, if Internet health information use is associated with coping. Questionnaires were completed (n = 178) regarding Internet use and also coping as measured by the Brief Cope. MANOVA analyses were conducted for the 14 coping subscales. Following a significant MANOVA omnibus test, univariate ANOVA and multivariate ANCOVA analyses adjusting for covariates were performed. Univariate ANOVA showed acceptance, active coping, self-blame, and denial coping associated with Internet use but these results were not maintained in the multivariate ANCOVA models. Internet health information use is not associated with psychological coping in breast cancer patients.

INTRODUCTION

NEW TECHNOLOGY in the form of Internet use has begun to impact the health care environment, as patients are increasingly using it as both a source of information and also for psychological support. For example, among a variety of cancer information sources sought by prostate cancer patients, 45% (295) of 654 individuals used the Internet for cancer information, 50.6% (331) of 654 used either television, books, or magazines, while only 19.0% (124) used the National Cancer Institute Cancer Information Service, so Internet use has surpassed the Cancer Information Service. In the same study however, the order of most important sources of information were traditional print/media, Cancer Information Service, and then the Internet.¹

As recent as 1997, a survey in the United States found that nearly half of Internet users spent some time looking for health information on the Internet.² In 2000, 41 million individuals sought health information online,³ while in January 2003, general (i.e., not exclusively health) use of the Internet in the United States was almost 111 million individuals.⁴ Cancer is one of the top three diseases about which the public seeks information on the Internet,⁵ and 9.5 million individuals in the United States sought cancer information online in 2002.⁶

There is a concern about the quality of the information obtained from websites as anyone can publish information on the Internet.⁷ ⁸ However, in one study that sampled actual patients as compared to researchers conducting web searches, breast cancer patients used many different websites for health information and consistently rated as their favorite websites those recognized to be reputable (i.e., from prominent universities, government organizations, or other recognized prominent health organizations).⁹ Also, the health information on the Internet has a positive psychological impact on...
those who use it, as use of the Internet for health information among breast cancer patients was found to be associated with greater social support and less loneliness. This all suggests the need for clinicians to recognize this new medium and incorporate it into their assessment and treatment.

A diagnosis and experience of breast cancer is distressful and individuals use various coping approaches. Some coping approaches are related to less distress (i.e., acceptance, humor, positive reframing), while others are related to greater distress (i.e., denial, behavioral disengagement, avoidance). Coping approaches to breast cancer differ among racial/ethnic groups.

In a previous study from this sample along with other measures, the coping measure was used as an overall score without separately analyzing the 14 subscales contained within it. In that study no differences in coping were found for Internet health information use among breast cancer patients. One may question if an overall score for coping is meaningful. Also, no studies exist regarding if particular aspects of coping are associated with Internet health information use. This study explores the 14 coping subscales of the measure named the Brief Cope to determine if Internet health information use among breast cancer patients is associated with particular aspects of coping.

MATERIALS AND METHODS

Participants

Participants were 178 patients seen by two breast surgeons at Columbia–Presbyterian Medical Center in New York City. Inclusion criteria included a diagnosis of ductal carcinoma in situ (DCIS) or invasive breast cancer within the past 3 years. Those >65 years at diagnosis were excluded, as elderly individuals were less likely to use the Internet. All patients who met these criteria were invited to participate. Participants with a prior psychiatric/substance abuse history or who did not speak English were excluded from participation by their physician. Institutional review board approval and informed consent was obtained.

Procedures

Participants were identified from hospital tumor registry records and mailed a letter describing the study along with a postal card to return if they were not interested in participating. Those who did not return the postal card were called and the nature of the study was described. Those who agreed to participate were mailed a packet with a questionnaire containing demographic, medical, and standardized psychological questionnaires. A postage-paid envelope was provided. Two follow-up phone calls were made to remind participants, if necessary. Medical information was obtained from hospital tumor registry records. All data collection took place between October and December 2000.

This study reports the data from a previous study of 188 individuals, which had a 74.9% participation rate and a 41.5% prevalence rate for Internet breast health information use. This study excludes those from the racial/ethnic category of Asian (n = 7), “other” (n = 1), and the individuals that did not complete the coping questionnaire (n = 2) from that sample from these analyses. In this study, the psychological questionnaire on coping is used. Two groups were formed: those not using the Internet (n = 103) and those using the Internet for breast health issues information use (n = 75).

Psychological measure

The Brief Cope is a 28-item scale that measures various aspects of coping. Response options range from I haven’t been doing this at all (1) to I’ve been doing this a lot (4) with four choices. There are 14 subscales of two items each that measure various cognitive coping thought processes and/or behavioral coping processes. These subscales are positive reframing, religion, substance abuse, venting, humor, instrumental support, acceptance, active coping, behavioral disengagement, self-blame, denial, self-distraction, emotional support, and planning. The scale has adequate Cronbach-alpha reliability in the original study (α = 0.50 to 0.82) and in this sample, all of the subscales had adequate reliability (αs = 0.59 to 0.91) except for behavioral disengagement with α = 0.42.

Internet measures

Participants were asked to circle yes or no to the question, “Do you use the Internet?” If yes, they were asked other questions relating to Internet use. For the world wide web topic they were asked to circle yes or no to the question asking, “Do you use the world wide web?” If yes, they were asked, “Do you use it for information regarding breast health/women’s health issues?”

Statistical analysis

Multivariate analysis of variance (MANOVA) was used to evaluate differences for Internet use / non-
use (defined as world wide web use in this study) as the predictor variable while the outcome measures were the 14 coping subscales. After evaluation of the Wilks’ lambda MANOVA omnibus test, univariate analyses of variance (ANOVA) were separately conducted for the 14 coping subscales. Also, multivariate analyses of covariance (ANCOVA), controlling for the covariates, were separately conducted for the 14 coping subscales. Covariates included race/ethnicity, household income, education, age, length of time since diagnosis, and stage of breast cancer. All categorical variables of race/ethnicity, household income, and stage of breast cancer were dummy coded.

Post hoc to avoid overadjusting for the six covariates, regression analyses were conducted regressing separately the 14 coping subscales on the Internet use predictor. Also, these 14 coping subscales were separately regressed on the Internet uses predictor along with one covariate. This was separately repeated for each covariate. Absolute value changes in regression coefficients for the Internet predictor were compared to determine if the Internet regression coefficients value changed a lot (i.e., even by 0.05) by the addition of the covariate. Based on these analyses the covariates of household income, education, and length of time since diagnosis were included as covariates for a separate series of ANCOVA analyses since they were judged to have an impact on the predictor in these regression analyses. All analyses were done with SPSS.\textsuperscript{16}

**Power analysis**

Power analyses were conducted a-priori for sample size estimation to determine the observed power. These analyses were conducted with G*POWER\textsuperscript{17} and using the coping subscale score as the outcome measure. The a-priori power analysis for the ANOVA showed that 64 participants in each group were necessary to detect a medium effect\textsuperscript{18} ($f$ = 0.50) with $\alpha = 0.05$ and power = 0.80.

**RESULTS**

Descriptive statistics for the continuous variables in this sample, measured in years, were age ($M = 51.8$, $SD = 8.2$), educational level ($M = 15.4$, $SD = 3.1$), and length of time since diagnosis of breast cancer ($M = 1.9$, $SD = 0.8$). Percentages for the categorical variables in this sample were race/ethnicity (white = 79.2%, minority [African American and Hispanic American] = 20.8%), stage of breast cancer (DCIS = 23.6%, stage 1 = 42.7%, stage 2–3 = 32.6%, missing = 1.1%), and household income (<$60,000 = 24.2\%$, $60,000–100,000 = 29.2\%$, >$100,000 = 36.0\%$, missing = 10.7%).

Wilks’ lambda MANOVA omnibus test for the model with Internet use alone as a predictor was significant $F(14, 163) = 2.02$, $p = 0.02$, and the null hypothesis that the coping subscales did not differ was rejected. As shown in Table 1, univariate ANOVA analyses of the 14 coping subscales indicated that greater acceptance and active coping were associated with Internet health information use and greater self-blame and denial coping were associated with Internet health information non-use. After a Bonferroni correction and setting $p$-values for significance at 0.004 (0.05/14), none of the coping subscales were significant.

Multivariate ANCOVA analyses including the six covariates indicated that none of the 14 coping subscales were significant at $p < 0.05$. Only self-blame approached significance with a $p$-value of 0.07, but after a Bonferroni correction, it did not approach significance. To avoid overadjusting by using six covariates, the ANCOVA analyses were repeated with the three covariates that were deemed key covariates based upon exploratory regression analyses. In these analyses, only acceptance coping was significant at $p < 0.05$ and active coping approached significance with $p = 0.06$. However, after a Bonferroni correction, they too did not approach significance.

**DISCUSSION**

This study found that acceptance, active coping, self-blame, and denial forms of coping were associated with use of the Internet for health information in a univariate analysis. However, as many statistical tests were simultaneously performed, a Bonferroni correction was justified and no statistical significance remained. Likewise, after entering the relevant covariates for two different models of multivariate analysis, only in one of the models was acceptance coping associated with Internet use. None of the other coping subscales were associated with use of the Internet for health information. These results support the prior study of coping as an overall measure\textsuperscript{10} and suggest that, except for the possibility of acceptance coping, other forms of coping are clearly not related to use of the Internet for health information. These results had more than adequate statistical power to conclude these negative results.

These results differ with the results of another study of a mixed sample of cancer patients. In that study, individuals were taught in an intensive man-
ner by a medical librarian how to obtain specific information for cancer topics on the Internet. 19 Participants attributed their positive well-being two months later to this specialized training. It may be that this specialized training offers the skills to properly benefit from Internet use of health information. However, another possibility exists in that breast cancer patients may have a different coping experience from those who are from a mixed sample of cancer patients.

Can we conclude that Internet health information use is related to coping? This study concludes one cannot, while the study above concludes that one can. 19 However, this study uses better methods and statistics, including an adequate statistical power analysis. Also, there is a lot of discussion about more comprehensive ways to measure coping besides through self-report questionnaires. 20 The possibility exists that measuring coping in ways besides self-report questionnaires may show different results. More research is needed regarding this area to definitely conclude that Internet health information use is irrelevant to coping.

Is Internet information use helpful to those with breast cancer? Although this study suggests that it does not help with their coping, previous research discusses the healthy psychological impact among women with breast cancer who use the Internet for health information where Internet users have greater social support and less loneliness than non-users. 10

Clinical implications from this and other research is that when patients bring in to their medical appointment health information obtained from the Internet, the benefits that they obtain are increased social support but this does not actually help them cope with their disease. It may be that due to the possibility that anyone can publish information on the Internet there remains the subconscious self-doubt that does not allow these individuals with breast cancer to allow it to offer them coping benefits. Why then do they seek this information? It may be that breast cancer patients are not satisfied with the information that they receive from their health care providers 21 and feel the need to seek this information, yet they bring it to their medical appointments in order to confirm the accuracy of their research.

Future research should measure coping in a more structured manner where both self-report measures and interview measures should be used. Also, coping should be measured at least twice each week for a period of a month in order to accurately assess the coping styles and levels among individuals coping

---

**Table 1. Brief Cope Subscales among 178 Women with Breast Cancer Using the Internet for Breast Health Information**

<table>
<thead>
<tr>
<th>Coping subscale</th>
<th>Web use, M (SD) (n = 78)</th>
<th>No web use, M (SD) (n = 74)</th>
<th>F statistic not controlling for covariates (ANOVA)</th>
<th>F statistic controlling for covariates (ANCOVA)</th>
<th>F statistic controlling for covariates (ANCOVA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive reframing</td>
<td>5.53 (1.80)</td>
<td>5.61 (1.92)</td>
<td>0.08</td>
<td>0.37</td>
<td>1.10</td>
</tr>
<tr>
<td>Religion</td>
<td>5.35 (2.25)</td>
<td>5.75 (2.21)</td>
<td>1.45</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Substance abuse</td>
<td>2.23 (0.67)</td>
<td>2.38 (0.95)</td>
<td>1.44</td>
<td>2.13</td>
<td>2.52</td>
</tr>
<tr>
<td>Venting</td>
<td>4.14 (1.77)</td>
<td>3.98 (1.73)</td>
<td>0.35</td>
<td>0.14</td>
<td>0.00</td>
</tr>
<tr>
<td>Humor</td>
<td>3.74 (1.85)</td>
<td>3.74 (2.12)</td>
<td>0.00</td>
<td>0.32</td>
<td>0.18</td>
</tr>
<tr>
<td>Instrumental support</td>
<td>4.98 (1.97)</td>
<td>4.79 (1.89)</td>
<td>0.41</td>
<td>0.79</td>
<td>0.60</td>
</tr>
<tr>
<td>Acceptance</td>
<td>7.19 (1.19)</td>
<td>6.67 (1.52)</td>
<td>6.17*</td>
<td>4.17*</td>
<td>3.47</td>
</tr>
<tr>
<td>Active coping</td>
<td>6.23 (1.63)</td>
<td>5.60 (1.80)</td>
<td>5.66*</td>
<td>3.47</td>
<td>2.01</td>
</tr>
<tr>
<td>Behavioral disengagement</td>
<td>2.31 (0.75)</td>
<td>2.57 (1.04)</td>
<td>3.48</td>
<td>0.80</td>
<td>1.06</td>
</tr>
<tr>
<td>Self-blame</td>
<td>2.74 (0.99)</td>
<td>3.27 (1.68)</td>
<td>6.08*</td>
<td>2.03</td>
<td>3.34</td>
</tr>
<tr>
<td>Denial</td>
<td>2.55 (1.10)</td>
<td>3.05 (1.56)</td>
<td>5.71*</td>
<td>1.05</td>
<td>0.45</td>
</tr>
<tr>
<td>Self-distraction</td>
<td>5.17 (2.06)</td>
<td>5.31 (1.97)</td>
<td>0.21</td>
<td>0.07</td>
<td>0.01</td>
</tr>
<tr>
<td>Emotional support</td>
<td>6.05 (1.87)</td>
<td>5.56 (1.70)</td>
<td>3.33</td>
<td>2.51</td>
<td>1.51</td>
</tr>
<tr>
<td>Planning</td>
<td>5.39 (1.73)</td>
<td>4.98 (2.05)</td>
<td>1.99</td>
<td>1.70</td>
<td>1.04</td>
</tr>
</tbody>
</table>

*a Covariates include household income, education, and length of time since diagnosis.

*b Covariates include race/ethnicity, household income, education, age, length of time since diagnosis, and stage of breast cancer.

*p < 0.05.
with breast cancer who use the Internet for health information use. In that manner, a more definitive answer to whether coping is associated with Internet use for health information can be obtained.

ACKNOWLEDGMENTS

Portions of this paper were presented at the First International Conference on Cancer on the Internet, New York, June 19–20, 2003.

REFERENCES


Address reprint requests to:
Joshua Fogel, Ph.D.
Johns Hopkins University
Bloomberg School of Public Health
624 North Broadway, Ste. 861
Baltimore, MD 21205
E-mail: jfogel@jhsph.edu