

Perceptions of Traditional Information Sources and Use of the World Wide Web to Seek Health Information: Findings From the Health Information National Trends Survey

STEPHEN A. RAINS

Department of Communication, University of Arizona, Tucson, Arizona, USA

As medical information becomes increasingly available and individuals take a more active role in managing their personal health, it is essential for scholars to better understand the general public's information-seeking behavior. The study reported here explores the use of the World Wide Web to seek health information in a contemporary information-media environment. Drawing from uses and gratifications theory and the comprehensive model of health information seeking, perceptions of traditional information sources (e.g., mass media, one's health care provider, etc.) are posited to predict use of the Web to seek health information and perceptions of information acquired from searches. Data from the Health Information National Trends Survey (HINTS; N = 3982) were analyzed to test study hypotheses. Trust in information-oriented media, entertainment-oriented media, and one's health care provider all predicted Web use behavior and perceptions. The implications of the findings for research on information seeking and the role of the Web in patient empowerment are discussed.

The lay public has more opportunities than ever before in history to take an active role in their own health care. The Internet, one's health care provider, friends, family, coworkers, television, radio, newspapers, magazines, and countless other sources offer information that may help individuals become informed or feel empowered (Anderson, 2004; Brashers, Goldsmith, & Hsieh, 2002; Dolan, Iredale, Williams, & Ameen, 2004; Johnson & Meischke, 1993; Kivits, 2004; Napoli, 2001). Among the myriad sources available, a fair amount of evidence suggests that the Internet and World Wide Web have become widely used resources for health information (Cline & Haynes, 2001; Fox & Fallows, 2003; Morahan-Martin, 2004). Indeed, during a typical day more people use the Internet to acquire medical information than visit a health professional (Fox & Ranie, 2002). As of 2004, half of all American adults have gone online to procure health information (Fox, 2005). Yet, granted the range of sources available, what prompts individuals to go online to find health information? How are perceptions of traditional sources of information related to Web use and perceptions of information found online?

The purpose of this research reported here was to explore use of the World Wide Web to seek health information in the context of a broader information-media

Address correspondence to Stephen A. Rains, Department of Communication, University of Arizona, Tucson, AZ 85721-0025, USA. E-mail: srains@email.arizona.edu

environment. Drawing from uses and gratifications theory (UGT; Blumler & Katz, 1974) and the comprehensive model of health information seeking (CMIS; Johnson & Meischke, 1993) I assessed the relationship between perceptions of traditional information sources and use of the Web to acquire health information. Using data collected in the 2002–2003 Health Information National Trends Survey (HINTS; National Cancer Institute, 2003), I examined trust in medical information from one's health care provider, family, and mass media outlets as a predictor of Web use and the perceived usefulness of the information acquired from health searches. The results of this study offer insights into information seeking by the lay public and provide a better understanding of the interdependent function of health information sources on an individual's perceptions and behavior. In the following sections, research exploring information seeking online and traditional sources of health information is examined to develop study hypotheses.

Review of Literature

Web Use and Traditional Sources of Health Information

In the context of health, information seeking has been referred to as “one of the primary functional coping strategies that individuals have at their disposal” (Johnson, Meischke, Grau, & Johnson, 1992, p. 186). Information is conceptualized as “stimuli from a person's environment that contribute to his or her knowledge or beliefs” (Brashers et al., 2002, p. 259). Information is essential to assess, maintain, or change one's health and health behaviors (Goldsmith, 2001; Johnson & Meischke, 1993). As Brashers (2001) notes, information can be used to manipulate uncertainty in a desired direction to confirm or disconfirm one's beliefs.

Information seeking occurs in an environment in which a variety of sources are potentially available (Brashers et al., 2002; Johnson & Meischke, 1993). Napoli (2001) explains that medical information may be gleaned from formal sources like a health care provider, informal sources such as one's family, or mass media sources like television, radio, newspapers, and magazines. A growing number of Americans have reported using the Web to find health information in recent years (Fox, 2005; Fox & Rainie, 2000). Cline and Haynes (2001) list some of the advantages of seeking information online, including widespread access, anonymity, potential for interactivity, social support, and the ability to tailor information to one's needs. Further, there is a plethora of information available online. An estimated 70,000 websites (Cline & Haynes, 2001)—or around 2% of all sites on the Web (Powell & Clarke, 2002)—offer some form of health-related information. Although questions have been raised about information quality (Eysenbach, Powell, Kuss, & Sa, 2002) and consumer evaluation behavior (Fox & Rainie, 2002; Hansen, Derry, Resnick, & Richardson, 2003), the information gathered from online searches appears to have a notable influence on health behavior (Fox & Ranie, 2002; Morahan-Martin, 2004).

To date, a fair amount of research has been conducted exploring the demographic characteristics of those using the Web specifically to acquire medical information. Those who are older, more educated, and have a larger household income are more likely to venture online for medical information (Anderson, 2004; Bernhardt, McClain, & Parrott, 2004; Bowen et al., 2003; Cotten & Gupta, 2004; Diaz et al., 2002). Other predictors include the perceived risk of becoming ill (Bernhardt et al., 2004) and quality of one's current health (Bowen et al., 2003;

Cotten & Gupta, 2004). Yet, beyond identifying demographic characteristics, it is important to explore other factors that are related to Web usage and users' behaviors. One factor that may be particularly important is the information-media environment in which a would-be information seeker is situated. Prior research indicates that individuals vary in their perceptions of the quality of different information sources (Johnson & Meischke, 1992) and consult a combination of channels to acquire medical information (Johnson et al., 1992). The Web may be used interdependently with traditional information outlets (Napoli, 2001).

Both UGT (Blumler & Katz, 1974) and Johnson and Meischke's CMIS (Johnson & Meischke, 1992, 1993; Johnson et al., 1992) provide a useful foundation to examine the role that traditional sources play in Web use. The CMIS is grounded in UGT, and both assume that individuals actively select media to satisfy goals and needs. The CMIS identifies different factors that motivate individuals to use a particular channel to acquire health information, including characteristics of available channels. Although not specified in the CMIS, it seems possible that perceptions of the other information sources available may shape information-seeking behavior and channel use.¹ Indeed, a key assumption of UGT is that perceptions of media—which are determined by shared perceptions of the typical use of a medium and other media that may serve the same purpose—are important factors motivating media use (Flanagin & Metzger, 2001; Lichtenstein & Rosenfeld, 1983; Perse & Courtright, 1993). Further, recent research demonstrates that almost all media (including face-to-face communication and the Internet) are perceived to serve information-seeking functions (Flanagin & Metzger, 2001; Papacharissi & Rubin, 2000). Two broad classes of traditional sources, in particular, may affect Web use: media and people.

Media. Mass media serve as an important source for health information (Atkin & Wallack, 1990). Indeed, television and newspapers often are cited as a source from which individuals frequently receive medical information (Brodie, Kjellson, Hoff, & Parker, 1999; Cotten & Gupta, 2004; Dolan et al., 2004; Johnson & Meischke, 1993). Mass media can be distinguished into two distinct types of information sources (Dutta-Bergman, 2004; 2005). Information-oriented media, which include newspapers and magazines, typically contain more credible information and allow individuals to engage in an active, goal-directed searches for medical information. Entertainment-oriented media, including television and radio, typically have less credible information and may downplay risks associated with unhealthy practices (e.g., alcohol consumption, unsafe sex, etc.).

Perceptions of these two types of media as sources of health information may be associated with use of the Web for information seeking and perceptions of information acquired. Negative perceptions about information- and entertainment-oriented media may make individuals more likely to seek information on the Web. Those who do not trust information from these two types of traditional sources may be motivated to use the Web to find information. The Web may be perceived as an alternative to traditional media sources (Cai, 2004; Flanagin &

¹It is noteworthy to clarify that this is not an argument for media displacement (Cai, 2004). Use of the Web as an information alternative does not necessarily mean that the Web displaces time spent on other media. It seems reasonable that the Web may be used in addition to other sources; the Web and other sources of health information may be interdependent (Napoli, 2001).

Metzger, 2001; Ferguson & Perse, 2000; Metzger & Flanagin, 2002; Napoli, 2001). Further, an individual's feelings about mass media sources also may extend to perceptions of information found online. Respondents in Diaz and Colleagues (2002) study who used the Internet for medical information rated information from the radio and television news to be significantly less useful than those who did not use the Internet.

People. In addition to mass media, health practitioners and family are important sources of health information (Cotten & Gupta, 2004; Hart, Henwood, & Wyatt, 2004; Johnson & Meischke, 1992; Rokade et al., 2002). One's family and health care provider are consistently cited as trustworthy (Diaz et al., 2002; Johnson & Meischke, 1992) and widely utilized resources—especially in regards to treatment decisions (Dolan et al., 2004; Eysenbach & Kohler, 2002). These two types of outlets particularly are useful for reducing uncertainty and addressing person-specific concerns (Johnson & Meischke, 1992).

Perceptions of family and health practitioners as sources for medical information may also predict Web use. There is increasing evidence that the Internet is influencing doctor–patient relations as patients are becoming more informed and taking a more active role in their health (Akerkar & Bichile, 2004; Rokade et al., 2002; Williams, Nicholas, & Huntington 2003). As with mass media, the Web may be seen as an alternative for information. Individuals may turn to the Web when they are not satisfied with the information from their doctor or want to gain access to a different perspective (Broom, 2005; Chen & Siu, 2001; Eysenbach & Kohler, 2002; Hart et al., 2004; Pereira, Koski, Hanson, Bruera, & Mackey, 2000). Further, feelings about one's family and health care provider as sources of information may extend to influence perceptions of information acquired online. Individuals in Diaz and colleagues's (2002) study who used the Internet for health information rated information from their family to be significantly less useful than those who did not use the Internet.

Hypotheses

It is argued in this article that the information-media environment in which consumers are situated shapes information-seeking behavior. Drawing from theories of media use and health information-seeking behavior, I argue that perceptions of traditional information sources should predict use of the Web to acquire health information, utilization of the Web as a primary resource, and perceptions about the utility of medical information derived from searches. Additionally, an information seeker's feelings about the using the Web for medical information likely is to be associated with Web use behavior and perceptions (Bernhardt et al., 2004). In testing the preceding ideas, the influences of four variables were controlled.² The control variables consist of factors that have been demonstrated in previous research consistently to predict Web use for information seeking, including age, education

²Although income is a known predictor of Web use to acquire health information, it was not controlled for in this study. Approximately 40% ($n = 1,648$) of the sample used in this study did not report their household income. Additionally, there were significant differences in the dependent variables for those who did and did not report their income. As such, income was omitted as a control variable in this study.

(Anderson, 2004; Bernhardt et al., 2004; Bowen et al., 2003; Cotten & Gupta, 2004; Diaz et al., 2002); risk of becoming ill (Bernhardt et al., 2004; Bowen et al., 2003; Cotten & Gupta, 2004); and attention to health information in the media (Dutta-Bergman, 2004, 2005).

Hypothesis 1. Controlling for other known predictors, trust in health information from (a) information-oriented media, (b) entertainment-oriented media, (c) one's health care provider, (d) one's family and friends, and (e) the Web will predict one's use of the Web to gather medical information.

Hypothesis 2. Controlling for other known predictors, trust in health information from (a) information-oriented media, (b) entertainment-oriented media, (c) one's health care provider, (d) one's family and friends, and (e) the Web will predict one's likelihood of using the Web as a primary information source.

Hypothesis 3. Controlling for other known predictors, trust in health information from (a) information-oriented media, (b) entertainment-oriented media, (c) one's health care provider, (d) one's family and friends, and (e) the Web will predict the perceived usefulness of information acquired from Web searches.

Method

Data

A subsample of the data collected in the 2002–2003 HINTS study (National Cancer Institute, 2003) was used to test the preceding hypotheses. In brief, HINTS is a nationally representative telephone survey of 6,360 American adults conducted by the National Cancer Institute. The goal of the HINTS study was to track use of the Internet to access cancer information and to assess prevailing knowledge, attitudes, and beliefs about cancer. Most germane to this study, respondents in the HINTS study were asked specific questions about their use of the Internet and World Wide Web to seek cancer-related information and perceptions of traditional sources of information about cancer. A full review of the questionnaire construction, survey design and sampling procedures is reported by Nelson and colleagues (2004).

The subsample of data analyzed in this study consisted of responses from only those individuals who indicated having used the Internet previously ($n = 3,982$). This subsample was selected for analysis because Web use is contingent upon access to the Internet.³ Of the individuals in the subsample used for this study, 58.8% are female, and the mean age at the time of the study was approximately 43 years ($SD = 14.51$). Most respondents (67.6%) indicated having a regular health care provider, and a majority (59.6%) reported visiting their health care provider between 1 and 4 times during the previous 12 months.

³It should be noted that it is possible that those who reported having access to the Internet may not have had access to the World Wide Web. However, it is reasonable to assume that most respondents had access to both the Internet and Web.

Measures

All measures were constructed for this study from the items in the HINTS questionnaire.

Trust in Information Sources. Respondents were asked to rate the degree to which they trust cancer information from a number of sources on a 4-point Likert-type scale with the anchors *not at all* and *a lot*. Greater values for the trust variables indicate a greater amount of trust. Trust in information-oriented media was measured with two items concerning trust in newspapers and magazines ($M = 2.77$; $SD = .74$; $\alpha = .80$). Trust in entertainment-oriented media was measured with two items addressing trust in television and radio ($M = 2.67$; $SD = .69$; $\alpha = .62$). Trust in doctors was measured with a single item in which respondents rated their trust in cancer information from a “doctor or other health care professional” ($M = 3.59$; $SD = .59$). Trust in one’s family was measured with a single item assessing trust in cancer information from family or friends ($M = 2.79$; $SD = .75$). Finally, trust in the Web was assessed with a single item about trust in cancer information from the Internet ($M = 3.03$; $SD = .84$).⁴

Web Use. Use of the Web to seek cancer information was measured with a single, dichotomous item. Respondents were asked to indicate whether they ever have visited an Internet website specifically to learn about cancer. Participants who reported using the Web were assigned a value of 1, and those who had not were assigned a value of 0 ($M = .43$; $SD = .50$).

Web as a Primary Resource. A single, dichotomous measure was constructed to assess whether the Web was used as a primary information resource. Respondents reported the first source they turned to the last time they needed information about cancer. Thirteen information sources were presented to respondents, including books, brochures, family, friends/coworkers, health care provider, Internet, library, magazine, newspapers, radio, television, cancer organization, and telephone informational number (toll-free call). Respondents who used the Internet first were assigned a value of 1, and those who used an alternative source first were coded 0 ($M = .60$; $SD = .49$).

Perceived Usefulness. The usefulness of information derived from Web searches was assessed with a single item. Respondents rated the overall usefulness of the cancer-related information that they found on the Internet on a 4-point Likert-type scale with the anchors *not at all useful* and *very useful* ($M = 3.34$; $SD = .64$). Greater values for this item indicate that the information was more useful.

⁴Although the term “Internet” is used in this item, the wording of the question makes it likely that the item refers specifically to the World Wide Web. Respondents were asked to rate the degree to which they trust information from the Internet. The nature of this question makes it seem unlikely that participants were referring to e-mail or voice-over-Internet protocol (VoIP) in making their rating. Indeed, even if participants did use e-mail or VoIP to communicate with their health care provider, the health care provider would be considered the source of information—not the “Internet.” Accordingly, participants answering this question are assumed to be referring specifically to the Web. This assumption also was made in evaluating responses to the measures of the respondent’s primary source for cancer information and the usefulness of information.

Control Variables. Four control variables were included in the study. Each has been demonstrated to predict use of the Internet to seek health information. First, respondents self-reported their age ($M = 42.66$; $SD = 14.51$). Respondents' level of education was assessed by having them indicate the highest grade in school that they completed. Respondents were given six options representing standard segments in contemporary U.S. education, such as elementary school, some high school, high school, some college, and so on. Larger values for this measure indicate a greater amount of schooling completed. Almost half (44%) of the sample who reported their education indicated earning a college degree or more. A third control variable was the likelihood of developing cancer. Respondents completed a single-item measure in which they reported their perceived chance of developing cancer in the future on a 5-point Likert-type scale with the anchors *very low* and *very high* ($M = 2.58$; $SD = 1.06$). Finally, attention to health information in the media was assessed with a five-item measure. Participants rated the degree to which they pay attention to health or medical topics on five different media, including television, radio, newspaper, magazines, and the Internet. Ratings were made on a 4-point Likert-type scale with the anchors *not at all* and *a lot*. Responses to each of the four items were combined to form the measure of health information awareness ($M = 2.50$; $SD = .75$; $\alpha = .64$). Larger values for the measures of a respondent's chance of developing cancer and information attention indicate a greater amount of the variable.

Procedure for Data Analysis

Hierarchical regression was used to test the study hypotheses. This procedure makes it possible to assess the relationship between the criterion and outcome variables after accounting for the variance associated with the control variables. The control variables were entered in the first step of the model, and the five criterion variables were entered in the second step. The t tests for the criterion variables were used to evaluate the hypotheses. *STATA* 9 was used to conduct the regression analyses. The weights generated for the HINTS data set were not used.

Results

Tests of Hypotheses

Predictors of Web Use to Seek Cancer Information

Hypotheses 1(a)–(e) proposed that trust in traditional information sources and trust in the Web will predict use of the Web to seek medical information. Given that the outcome variable is dichotomous, logistic regression was used to test each of the hypotheses (Agresti, 1996). In this instance, the odds ratio (β) represents the ratio of the odds of using the Web to seek cancer information with the odds of not using the Web.

Results of the analyses are presented in Table 1 and provide support for Hypotheses 1(b), 1(c), and 1(e). After controlling for known predictors of Web use, trust in cancer information from one's doctor, entertainment media, and the Web were significant predictors of Web use. Trust in one's doctor and entertainment media as sources of information about cancer negatively were related to Web use. The odds of using the Web to find health information increased by factors of 1.22 and 1.20

Table 1. Results of the hierarchical regression model testing hypothesis 1(a)–(e): Predicting Web use to seek information about cancer

	β	SE	95% CI
Step 1: Control variables			
Education	1.25**	.06	1.14–1.37
Age	1.00	.003	.99–1.00
Risk of contracting cancer	1.23**	.05	1.14–1.33
Attention to health information	1.76**	.10	1.56–1.97
Step 2: Predictors			
Trust information-oriented media	.93	.08	.79–1.10
Trust entertainment-oriented media	.83*	.07	.70–.99
Trust family	.91	.06	.81–1.03
Trust doctor	.82**	.06	.71–.96
Trust Web	1.74**	.12	1.53–1.99

Note. Dependent variable = Web use. β represents the odds ratio. An odds ratio greater than one indicates respondents were more likely to have used the Web to seek information about cancer. An odds ratio of less than one indicates that respondents were less likely to have used the Web to seek cancer information.

* $p < .05$; ** $p < .01$.

for each one unit decrease in trust of one's doctor and entertainment media, respectively. The relationship between trust in the Web and Web use was positive; a one-unit increase in one's trust of the Web as a source of cancer information increased the odds of Web use by 1.74. Hypotheses 1(a) and 1(d) were not supported.

Predictors of Using the Web as an Initial Resource. Hypotheses 2(a)–(e) posit that trust in traditional information sources and the Web should predict use of the Web as a primary information resource. Again, logistic regression was used to test these hypotheses. In this instance, the odds ratio represents the ratio of the odds of using the Web first to seek cancer information versus the odds of using an alternative information source first. Results of the analysis are presented in Table 2 and provide support for Hypotheses 2(a) and 2(e). Controlling for known predictors of Web use, trust in information-oriented media as a source of cancer information negatively was associated with use of the Web as an initial resource. A one-unit decrease in trust in information-oriented media increased the odds of turning to the Web first over any other source to find cancer information by a factor of 1.32. Increased trust in the Web increased the odds of using the Web first by a factor of 2.31. Hypotheses 2(b), 2(c), and 2(d) were not supported.

Predictors of Perceived Usefulness of Information from Web Searches. Hypotheses 3(a)–(e) forward that trust in traditional information sources and the Web will predict the perceived usefulness of information derived from Web searches. Linear, hierarchical regression was used to test these hypotheses, and the results are available in Table 3. The results provide support for Hypotheses 3(c) and 3(e). Controlling for known predictors of Web use, trust in one's doctor and the Web as sources of cancer information were associated positively with the perceived usefulness of information acquired from Web searches. Hypotheses 3(a), 3(b), and 3(d) were not supported.

Table 2. Results of the hierarchical regression model testing hypothesis 2(a)–(e): Predicting use of the Web as a primary information resource

	β	SE	95% CI
Step 1: Control variables			
Education	1.08	.06	.96–1.22
Age	.97**	.004	.97–.98
Risk of contracting cancer	.98	.05	.90–1.08
Attention to health information	1.39**	.10	1.20–1.60
Step 2: Predictors			
Trust information-oriented media	.76*	.09	.61–.95
Trust entertainment-oriented media	.82	.09	.66–1.02
Trust family	.95	.07	.82–1.10
Trust doctor	.97	.09	.81–1.18
Trust Web	2.31**	.20	1.96–2.71

Note. Dependent variable = primary resource. β represents the odds ratio. An odds ratio greater than one indicates respondents were more likely to have used the Web as a primary resource for cancer information. An odds ratio of less than one indicates that respondents were more likely to use an alternate information source as a primary resource for cancer information.

* $p < .05$; ** $p < .01$.

Discussion

The purpose of this study has been to explore use of the Web to seek health information in a contemporary information-media environment. Three hypotheses were

Table 3. Results of the hierarchical regression model testing hypothesis 3(a)–(e). Predicting the perceived usefulness of information retrieved from health searches on the Web

	β	SE	R^2
Step 1: Control variables			.01*
Education	.03	.02	
Age	.03	.002	
Risk of contracting cancer	–.03	.02	
Attention to health information	.07*	.03	
Step 2: Predictors			.09**
Trust information-oriented media	–.01	.06	
Trust entertainment-oriented media	–.04	.05	
Trust family	.01	.03	
Trust doctor	.07*	.04	
Trust Web	.28**	.04	

Note. Dependent variable = perceived usefulness. Regression coefficients are standardized. Usefulness was coded such that larger values represent a greater amount of perceived usefulness.

* $p < .05$; ** $p < .01$.

tested using a subset of data from the 2002–2003 HINTS study. In the following paragraphs, the results of the study are discussed, limitations are considered, and directions for future research are offered.

The findings from this study provide some support for the idea that the information-media environment in which one is situated is associated with one's use and perceptions of the Web as a source for medical information. Perceptions of traditional sources predicted use of the Web to seek medical information, use of the Web as a primary information resource, and the perceived usefulness of information derived from Web searches. A trend throughout the results is that distrust in traditional sources of information was associated with increased Web use. In particular, distrust in one's health care provider and entertainment-oriented media as sources of health information increased respondents' odds of using the Web. Given prior research demonstrating that individuals consult multiple sources when seeking health information (Finnegan, Viswanath, Kahn, & Hannan, 1993; Kivits, 2004), it seems possible that a lack of trust in traditional sources may be one factor motivating individuals to use the Web for medical information.

Another noteworthy finding is that distrust in information-oriented media increased the odds of turning to the Web first before any other information source. Although magazines and newspapers typically are rated fairly high in terms of credibility (Johnson & Meischke, 1992), some individuals may develop distrust in them (Brodie et al., 1999). For these individuals, the Web may provide a viable information alternative. The Web is similar to newspapers and magazines in that the individual plays an active role in information seeking (Dutta-Bergman, 2004). Yet the volume of information available on the Web dwarfs that in magazines and newspapers, and, as a result, offers individuals even more control over the information-acquisition process.

The results of this study also demonstrate that trust in at least one traditional source was associated with perceptions of the actual information gleaned from searches. Those who distrusted information from their doctor were also more likely to rate the information from online health searches as useless. This finding has important implications for research on the role of the Web in patient empowerment. Although respondents who distrusted their health care provider were more likely to use the Web, they were less likely to perceive the information they acquired online to be useful. One explanation for these findings is that, in an effort to maintain the traditional patient–provider hierarchy, health care providers may discourage patients from asking questions or sharing information gleaned from the Web (Anderson et al., 2003; Broom, 2005; Eysenbach, 2003; Kivits, 2004; Newnham et al., 2005). Broom (2005), for example, reported that “the empowering nature of the information [participants in his study] retrieved from the Internet and other sources depended on how receptive providers and specialists were to their desire to take part in the decision-making process” (p. 337). The findings from this study are consistent with Broom's results and suggest that the ultimate utility of the Web as a resource may be contingent upon on the quality of the patient–provider relationship.

Taken as a whole, the results of this study inform UGT and the CMIS by demonstrating the importance the socioinformational context in which media use and information seeking takes place. Use of the Web to acquire medical information appears to be influenced by perceptions of traditional information sources. Trust in information-oriented media, entertainment-oriented media, and one's doctor all predicted Web use behavior and perceptions. The findings from this study also

provide some evidence of the interdependence of media and suggest that the Web is an alternative to traditional media for information-seeking purposes.

The results of the study also indicate that trust in the Web as an information source predicted Web use and perceptions of the utility of information found online. Although these findings are not all that surprising, they are informative, demonstrating the importance of perceptions of the Internet and World Wide Web in actual Web use. Recent studies suggest that—although they have access—a sizeable number of people choose not to use the Web for health information (Cotten & Gupta, 2004; Diaz et al., 2002; Dolan et al., 2004). For scholars and practitioners interested in better understanding motivations for using the Web to seek medical information, trust appears to be a key factor (Dutta-Bergman, 2003). The results of this study suggest that trust is essential to motivate people to go online and to perceive that the information they find is useful.

Finally, it is important note that trust in information from one's family did not predict use of the Web or the perceived utility of information found online. One explanation for this finding is that trust in one's family may be important, but only in certain situations. When evaluating treatment options or considering a second opinion, one's family may play a more critical role. In these instances, inadequate information from one's family may increase Web use.

Limitations and Directions for Future Research

This study is not without limitations. First, reliance on an existing data set necessitated the use of available measures. Many of the variables, however, were assessed with a single item. Use of single-item measures may have resulted in increased error variance and attenuated effects. Yet, given that a number of hypotheses were supported, this may not have been a major concern. A second potential limitation stems from the nature of data collection. The cross-sectional design made it impossible to make causal claims from the results of the analyses. To help mitigate this limitation, previous research on the topic was used to aid the interpretation of findings. A final limitation is that the weights generated for the data set by the National Cancer Institute were not used in the analyses. Generalizations about the population based on the findings from this study should be made cautiously.

The results from the study suggest several directions for future research. First, future research should continue to explore the interrelationship among health information sources. One issue to examine is the order in which different information sources are sought. Consumers may follow an information-gathering protocol. Understanding the information-acquisition process will make it possible for scholars and practitioners to develop more effective health campaigns. Second, longitudinal research is necessary to better understand Web use and a patient's relationship with his or her health care provider. Although it seems likely that the relationship is recursive, an individual's relationship with his or her health care provider may initially spur use of the Web to seek information, and the nature of the information gleaned may, in turn, impact the doctor-patient relationship. A final direction for future research is to explore the behavioral outcomes of information derived from different sources. It seems possible that consumers may be more or less likely to enact information from some sources (e.g., one's doctor) than others (e.g., a television program).

Conclusion

The explosive growth in use of the Internet and World Wide Web to seek health information has raised a number of questions among scholars and practitioners. This study has focused on one such question and examined the interdependent function of health information sources on consumer perceptions and behavior. Future research is essential to better understand other factors that influence use and effects of the Internet in consumer health.

References

- Agresti, A. (1996). *An introduction to categorical data analysis*. New York: John Wiley & Sons, Inc.
- Akerkar, S. M. & Bichile, L. S. (2004). Doctor patient relationship: Changing dynamics in the information age. *Journal of Postgraduate Medicine*, 50(2), 120–122.
- Anderson, J. G. (2004). Consumers of e-health: Patterns of use and barriers. *Social Science Computer Review*, 22(2), 242–248.
- Anderson, J. G., Rainey, M. R., & Eysenbach, G. (2003). The impact of cyberhealthcare on the physician-patient relationship. *Journal of Medical Systems*, 27, 67–84.
- Atkin, C. & Wallack, L. (Eds.) (1990). *Mass communication and public health: Complexities and conflicts*. Newbury Park, CA: Sage.
- Bernhardt, J. M., McClain, J., & Parrott, R. L. (2004). Online health communication about human genetics: Perceptions and preferences of internet users. *CyberPsychology & Behavior*, 7(6), 728–733.
- Blumler, J. G. & Katz, E. (1974). *The uses of mass communications: Current perspectives on gratifications research*. Beverly Hills, CA: Sage.
- Bowen, D. J., Meischke, H., Bush, N., Wooldridge, J. A., Robbins, R., & Ludwig, A. et al. (2003). Predictors of Women's Internet Access and Internet health seeking. *Health Care for Women International*, 24(10), 940–951.
- Brashers, D. E. (2001). Communication and uncertainty management. *Journal of Communication*, 51, 477–497.
- Brashers, D. E., Goldsmith, D. J., & Hsieh, E. (2002). Information seeking and avoiding in health contexts. *Human Communication Research*, 28, 258–271.
- Brodie, M., Kjellson, N., Hoff, T., & Parker, M. (1999). Perceptions of Latinos, African Americans, and Whites on media as a health information source. *The Howard Journal of Communication*, 10, 147–167.
- Broom, A. (2005). Virtually he@lthy: The impact of Internet use on disease experience and the doctor-patient relationship. *Qualitative Health Research*, 15, 325–345.
- Cai, X. (2004). Is the computer a functional alternative to traditional media? *Communication Research Reports*, 21, 26–38.
- Chen, X. & Siu, L. L. (2001). Impact of the media and the Internet on oncology: Survey of cancer patients and oncologists in Canada. *Journal of Clinical Oncology*, 19, 4291–4297.
- Cline, R. J. & Haynes, K. M. (2001). Consumer health information seeking on the Internet: The state of the art. *Health Education Research*, 16, 671–692.
- Cotten, S. R. & Gupta, S. S. (2004). Characteristics of online and offline health information seekers and factors that discriminate between them. *Social Science & Medicine*, 59(9), 1795–1806.
- Diaz, J. A., Griffith, R. A., Ng, J. J., Reinert, S. E., Friedmann, P. D., & Moulton, A. W. (2002). Patients' use of the Internet for medical information. *Journal of General Internal Medicine*, 17(3), 180–185.
- Dolan, G., Iredale, R., Williams, R., & Ameen, J. (2004). Consumer use of the Internet for health information: A survey of primary care patients. *International Journal of Consumer Studies*, 28, 147–153.

- Dutta-Bergman, M. (2003). Trusted online sources of health information: Differences in demographics, health beliefs, and health-information orientation. *Journal of Medical Internet Research*, 5. Retrieved December 1, 2005, from <http://www.jmir.org/2003/3/e21/index.htm>
- Dutta-Bergman, M. J. (2004). Primary sources of health information: Comparisons in the domain of health attitudes, health cognitions, and health behaviors. *Health Communication*, 16(3), 273–288.
- Dutta-Bergman, M. J. (2005). Developing a profile of consumer intention to seek out additional information beyond a doctor: The role of communicative and motivation variables. *Health Communication*, 17(1), 1–16.
- Eysenbach, G. (2003). The impact of the Internet on cancer outcomes. *CA: A Cancer Journal for Clinicians*, 53, 356–371.
- Eysenbach, G. & Kohler, C. (2002). How do consumers search for and appraise health information on the World Wide Web? A qualitative study using focus groups, usability tests, and interviews. *BMJ*, 324, 573–577.
- Eysenbach, G., Powell, J., Kuss, O., & Sa. E. R. (2002). Empirical studies assessing the quality of health information for consumers of the World Wide Web. *Journal of the American Medical Association*, 287, 2691–2702.
- Ferguson, D. A., & Perse, E. M. (2000). The World Wide Web as a functional alternative to television. *Journal of Broadcasting & Electronic Media*, 44(2), 155–174.
- Finnegan, J. R., Viswanath, K., Kahn, E., & Hannan, P. (1993). Exposure to sources of heart disease prevention information: Community type and social group differences. *Journalism Quarterly*, 70, 569–84.
- Flanagin, A. J. & Metzger, M. J. (2001). Internet use in the contemporary media environment. *Human Communication Research*, 27, 153–181.
- Fox, S. (2005). Health information online. *Pew Internet & American Life Project*. Retrieved July 15, 2005, from http://www.pewinternet.org/PPF/r/156/report_display.asp
- Fox, S. & Fallows, D. (2003). Internet health resources. *Pew Internet & American Life Project*. Retrieved June 15, 2004, from http://www.pewinternet.org/PPF/r/95/report_display.asp
- Fox, S. & Rainie, L. (2000). The online health care revolution. *Pew Internet & American Life Project*. Retrieved June 15, 2004, from http://www.pewinternet.org/PPF/r/26/report_display.asp
- Fox, S. & Rainie, L. (2002). Vital decisions: How Internet users decide what information to trust when they or their loved ones are sick. *Pew Internet & American Life Project*. Retrieved June 15, 2004, from http://www.pewinternet.org/PPF/r/59/report_display.asp
- Goldsmith, D. J. (2001). A normative approach to the study of uncertainty and communication. *Journal of Communication*, 51, 514–533.
- Hansen, D. L., Derry, H. A., Resnick, P. J., & Richardson, C. R. (2003). Adolescents searching for health information on the Internet: An observational study. *Journal of Medical Internet Research*, 5(4), e25. Retrieved October 1, 2005, from <http://www.jmir.org/2003/4/e25/>
- Hart, A., Henwood, F., & Wyatt, S. (2004). The role of the internet in patient-practitioner relationships: Findings from a qualitative research study. *Journal of Medical Internet Research*, 6(3), e36. Retrieved October 10, 2005, from <http://www.jmir.org/2004/3/e36/>
- Johnson, J. D. & Meischke, H. (1992). Differences in evaluations of communication channels for cancer-related information. *Journal of Behavioral Medicine*, 15, 429–445.
- Johnson, J. D. & Meischke, H. (1993). A comprehensive model of cancer-related information seeking applied to magazines. *Human Communication Research*, 19, 343–367.
- Johnson, J. D., Meischke, H., Grau, J., & Johnson, S. (1992). Cancer-related channel selection. *Health Communication*, 18, 183–196.

- Kivits, J. (2004). Researching the informed patient. *Information, Communication, & Society*, 7(4), 510–530.
- Lichtenstein, A. & Rosenfeld, L. B. (1983). Normative expectations and individual decisions concerning media gratifications choices. *Communication Research*, 11, 97–109.
- Metzger, M. J. & Flanagin, A. J. (2002). Audience orientations toward new media. *Communication Research Reports*, 19, 338–351.
- Morahan-Martin, J. M. (2004). How Internet users find, evaluate, and use online health information: A cross-cultural review. *CyberPsychology & Behavior*, 7, 497–510.
- Napoli, P. M. (2001). Consumer use of medical information from electronic and paper media: Literature review. In R. E. Rice & J. E. Katz (Eds.), *The Internet and health communication: Experience and expectations* (pp. 79–98). Thousand Oaks, CA: Sage.
- National Cancer Institute. (2003). *Health Information National Trends Survey* [Data file]. [on-line]. Available: <http://cancercontrol.cancer.gov/hints/index.jsp>
- Nelson, D. E., Kreps, G. L., Hesse, B. W., Croyle, R. T., Willis, G., Arora, N. K., Rimer, B. K., Viswanath, K. V., Weinstein, N., & Alden, S. (2004). The health information national trends survey (HINTS): Development, design, and dissemination. *Journal of Health Communication*, 9(5), 443–460.
- Newnham, G. M., Burns, W. I., Synder, R. D., Dowling, A. J., Ranieri, N. R., Gray, E. L., & McLachlan, S. A. (2005). Attitudes of oncology health professionals to information form the Internet and other media. *Medical Journal of Australia*, 183, 197–200.
- Papacharissi, Z. & Rubin, A. M. (2000). Predictors of Internet use. *Journal of Broadcasting & Electronic Media*, 44, 175–196.
- Pereira, J. L., Koski, S., Hanson, J., Bruera, E. D., & Mackey, J. R. (2000). Internet usage among women with breast cancer: An exploratory study. *Clinical Breast Cancer*, 1, 148–155.
- Perse, E. M. & Courtright, J. A. (1993). Normative images of communication media: Mass and interpersonal channels in the new media environment. *Human Communication Research*, 19, 485–503.
- Powell, J. & Clarke, A. (2002). The WWW of the World Wide Web: Who, what, and why? *Journal of Medical Internet Research*, 4(1). Retrieved October 10, 2005, from <http://www.jmir.org/2002/1/e4/>
- Rokade, A., Kapoor, P. K., Rao, S., Rokade, V., Reddy, K. T., & Kumar, B. N. (2002). Has the Internet overtaken other traditional sources of health information? Questionnaire survey of patients attending ENT outpatient clinics. *Clinical Otolaryngology*, 27, 526–528.
- Williams, P., Nicholas, D., & Huntington, P. (2003). Health information on the Internet: A qualitative study of NHS direct online users. *Aslib Proceedings*, 55(5/6), 304–312.