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CONSUMERS OF E-HEALTH: PATTERNS OF USE AND BARRIERS

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Patterns of Use and Barriers

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In 2002, 80% of all adults in the United States sought health information and/or services online. This article reports the results of computer-assisted telephone interviews of a national random sample of 186 adults. The purpose of the survey was to clarify the circumstances under which consumers utilize Internet health resources and identify barriers to Internet use. The results indicated that although 78% of the respondents had used the Internet to obtain health information, only about 10% communicated by e-mail with their providers, purchased supplies over the web, or used the Internet to manage a chronic disease. At the same time, more than 50% of the respondents indicated an interest in using the Internet for clinical purposes. Major barriers to the use of the Internet for health-related purposes were potential threats to privacy, inaccuracy of information, problems in evaluating the quality of information and services obtained from the web, and physician disapproval.

CONSUMER USE OF THE INTERNET

In early 2002, 80% of all adults online in the United States, or 110 million Americans, were estimated to have sought health information online. This represents an increase of 13 million users from 2001 and 50 million from 1998 (Harris Interactive, 2002). A study by Fox and Rainie (2000) estimated that consumers in the United States use the Internet to search as many as 10,000 medically related web sites for information pertaining to their health care needs. In addition to seeking health-related information, consumers are increasingly using the Internet to purchase goods and services such as pharmaceutical products, to locate and enroll in clinical trials, to access their medical records, to manage chronic illnesses in their homes, and to participate in support groups (Anderson & Goodman, 2002). Electronic medical records that are accessible to patients and health care providers also may potentially facilitate more active patient participation in their health care decisions (Masys, Baker, Butros, & Cowles, 2002).

Consumers are also increasingly using the Internet to communicate with their physicians (Anderson, 2001; Baur, 2000; Pal, 1999; Sittig, King, & Hazelhurst, 2001), e-mail commu-

nication has several advantages. First, it is a direct source of contact between physicians and patients. Second, physicians can easily provide follow-up and continuity of care that is unavailable through other means. Third, patients may use e-mail to correspond with their physician to discuss potentially sensitive matters that they may feel uncomfortable discussing in person.

BARRIERS TO USE OF THE INTERNET

Although there is a growing trend toward incorporating patient preferences into medical decision making, physicians feel threatened in some instances when patients confront them with information about alternative therapies they have obtained from the Internet (Anderson, 2001). Furthermore, physicians are now encouraged to involve patients in their diagnostic and therapeutic decision making, but pressure to see an increasing number of patients in the same amount of time leads physicians to argue that there is simply not enough time to respond to patients' questions resulting from Internet searches (Barry, 1999).

Also, the quantity of available information is enormous, and its quality highly variable (Silberg, Lundberg, & Musacchio, 1997). This often makes it difficult for consumers to make competent health care decision and presents barriers to web-based health care utilization (Eysenbach & Kohler, 2002; Lindberg & Humphreys, 1998). Although immediate access to health-related information has been beneficial to both health care professionals and consumers, there is an increasing concern that some of the information obtained from the Internet is inaccurate, erroneous, misleading, or fraudulent and actually poses a threat to public health in general (Fallis & Fricke, 2001; McLeod, 1998). Judging the quality of health-related information is often difficult to do, and generating high-quality information that can be of use can also be problematic (Shepperd, Charnock, & Gann, 1999).

CONSUMER SURVEY

A survey of U.S. adults was undertaken to (a) further clarify the circumstances under which consumers utilize Internet health resources, (b) identify barriers to the use of the Internet, and (c) investigate how these barriers affect consumer use of the Internet for health-related purposes.

Data were collected utilizing a computer-assisted telephone interviewing (CATI) system. A random digit dialing sample of 3,000 phone numbers was obtained that included listed, unlisted, and business phone numbers. Numbers were called repeatedly until an interview was completed, an individual refused to participate in the survey, the number was a business or fax machine, or the telephone number was no longer in service. Up to eight attempts were made at calling each telephone number. The data were collected from March 2002 to May 2002.

Individuals contacted were eligible to participate in the interview if they were over the age of 18. No preference for inclusion was given to gender or to any other identifying demographic characteristic. A total of 186 respondents were interviewed: 135 individuals who accessed the Internet, of which 105 used the Internet for health-related purposes.

Questions included whether an individual had ever used the Internet for health-related purposes, what they thought of the quality of health information on the Internet, concerns they might have about overall Internet confidentiality, and how concerned they were about their doctor's reaction to their consulting the Internet for health information. Attitude questions were answered using a five-point, Likert-type scale of agreement, importance, or likelihood. Additional questions assessed respondent gender, race, year of birth, level of
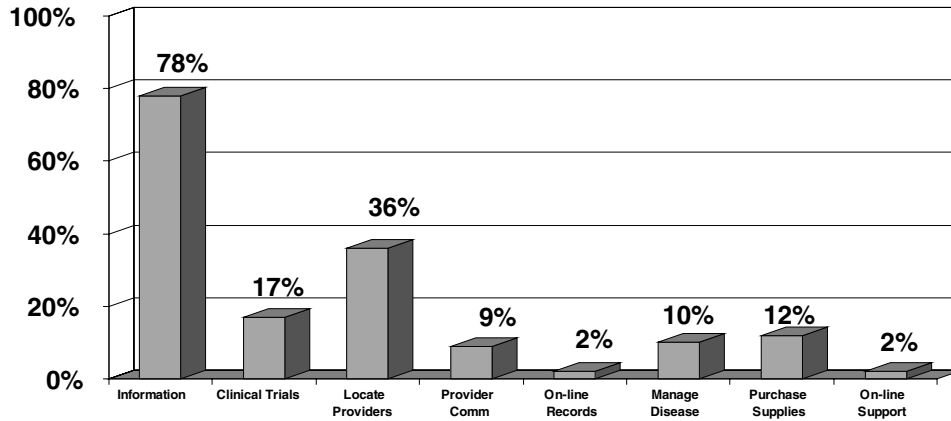
Figure 1   Figure Caption?

education, and annual income. Subjects were able to refuse to answer items as they deemed necessary.

RESULTS

Profile of Survey Respondents

Of the 186 individuals who responded to the survey, 44% were male, 77% were White and 14% were African Americans, the median education level of respondents was some college or vocational training, and median annual income was between $35,000 and $70,000. The average age of respondents was approximately 42 years old. Because the demographic characteristics of the sample are close to those reported by the 2000 U.S. Census, the sample appears to be representative of the U.S. adult population as a whole.

Basic Internet Use

Figure 1 shows use of the Internet for health-related purposes. Out of the 135 respondents who access the Internet, 105 (78%) have sought health information. Other uses of the Internet are less common. Slightly more than one third have used the Internet to locate providers, whereas 17% have sought information about clinical trials. Twelve percent have used the Internet to purchase medical supplies, prescription, or over-the-counter drugs. However, only 9% of respondents have ever communicated with their physician by e-mail, 10% of respondents with a chronic disease use the Internet for disease management, and 2% have online medical records.

The major reason given by 39% of respondents for using the Internet for health-related purposes was because it provided a quick means of obtaining health information. Another 30% indicated that they used the Internet to seek information about symptoms or treatment options for themselves or for others.
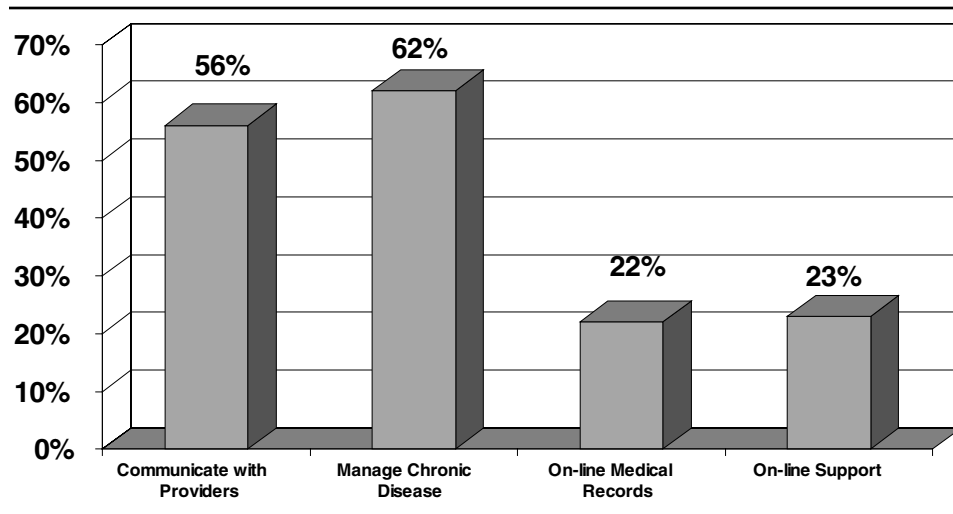
Figure 2   Figure Caption?

Although use of the Internet for purposes other than obtaining information is generally low, overall interest in using the Internet to communicate with providers is high (see Figure 2). More than 56% of respondents indicated that they would be interested in using the Internet to contact their physician if this option were available to them. Also, although only 10% of respondents with a chronic disease had used the Internet to chart or report their health status or to ask questions or make an appointment with their health care provider, almost two thirds (62%) expressed interest in using online services if they were available to them. Of respondents, 22% expressed interest in having their medical records available online, whereas 22% expressed interest in online support groups.

To determine the multivariate predictors of general Internet use, a logistic regression was run. Younger individuals ($B = -0.40$, $p = .006$, OR = .960), individuals with higher income ($B = -.915$, $p = .025$, OR = .400), and those with more education ($B = -1.190$, $p < .001$, OR = .304) were significant factors in predicting use of the Internet for health-related purposes.

Barriers to Internet Use for Health Purposes

Perceived barriers to the use of the Internet by consumers are shown in Figure 3. Fully 39% of the respondents indicated some level of concern about potential violations of privacy or confidentiality when using the Internet to obtain health information. Another 18% were uncertain about the protection provided users. Although 87% of consumers viewed the Internet as a reliable source of health information, 9% were uncertain, and 4% were concerned about potential unreliability of the information. Also, 18% of respondents expressed some concern about the accuracy of online health information, although almost one third (29%) stated they sometimes have trouble or were unsure about evaluating the quality of health information obtained from web sites.

Only a little more than a third of respondents (36%) who used the Internet for health-related purposes had discussed with their provider information about illness or treatments they had obtained online. Almost 1 out of 10 respondents felt that their physician would be upset if they used the Internet and web to investigate their health conditions, whereas another
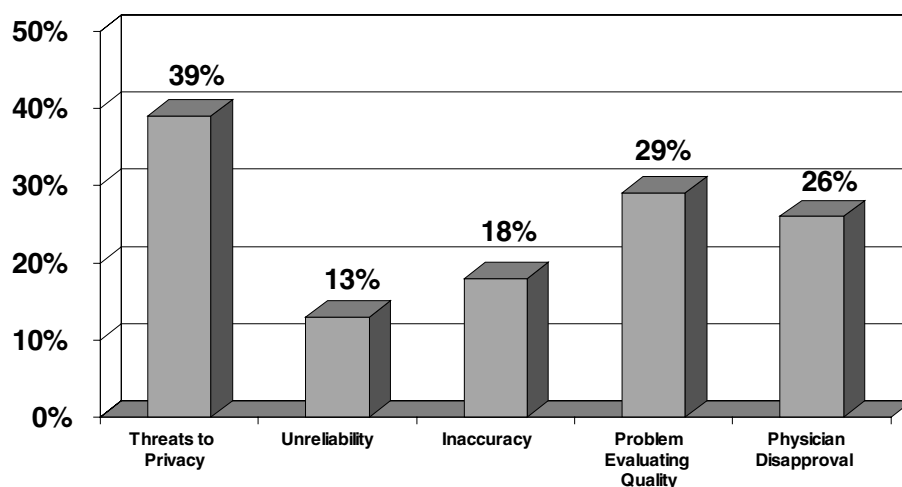
Figure 3   Figure Caption?

16% were uncertain how their physician would respond. A greater proportion of White adults and those under 30 years of age had discussed information obtained online with their physicians. There were no significant differences between males and females and by educational level or income level.

Significant relationships were found between an individual's belief that their doctor would be upset with them for having sought information on the Internet and race (χ^2 = 13.614, df = 4, p < .009) and educational level (χ^2 = 12.954, df = 4, p < .012). Generally speaking, African American adults and those with no education beyond high school believed that their doctor would be upset if they knew that the patient had sought health-related information on the Internet. There was a significant relationship between attitudes toward the Internet's reliability and having discussed medical information found on the Internet with one's doctor (χ^2 = 11.437, df = 4, p < .022) and the belief that doing so would upset an individual's doctor (χ^2 = 14.254, df = 4, p < .007). Individuals who believed that the Internet is a reliable source of information were more likely to have discussed Internet information with their physicians and less likely to think that their doctor would be upset if they did so.

DISCUSSION

Several factors contribute to a shift in the social role of patients from passive recipients to active consumers of health information (Anderson, Eysenbach, & Rainey, 2002). First, advances in medicine have led to unrealistic expectations on the part of patients. Many find it difficult to accept the fact that some diseases are untreatable. Second, highly specialized care on the part of physicians is often perceived by patients as impersonal, and physicians are perceived as being aloof from their patients. Third, the lack of time on the part of physicians spent with patients often elicits a sense of frustration and dissatisfaction with the consultation. Fourth, because the physician may lag behind the patient in familiarity with information technology such as use of the Internet, patients often leave the physician's office with a feeling that they are better able to seek information about their own health condition, treatment options, and health care strategies.

As predicted, this study found that younger, better educated individuals with higher incomes exhibited a higher level of general use of the Internet. Although U.S. adults overwhelmingly use the Internet to obtain health information, far fewer use it for other health-related purposes. In particular, patient-physician e-mail is still uncommon, and very few adults have an online medical record or use the Internet to manage a chronic disease at present. At the same time, interest is high among the public in using the Internet and web to assume more direct responsibility for their health care.

Major barriers to the use of the Internet for health-related purposes continue to exist. A majority of respondents (57%) expressed concern or uncertainty concerning the amount of protection provided for privacy and confidentiality when they seek health information on the Internet. Also, 13% expressed misgivings about the reliability of health information obtained from web sites. Consumers are also uncertain as to how their physician will respond to their efforts to obtain health information using the Internet. One out of four adults felt that their physician would disapprove or were uncertain as to their provider's response. Individuals with lower levels of education in particular were more likely to think that their doctor would be upset for having sought medical information on the Internet.

Not surprisingly, belief in the Internet's reliability positively affects whether an individual has discussed information with his or her doctor and the belief that such an action would upset their physician. As expected, those who believed that the Internet is a reliable source of information were more likely to have discussed this information with their doctor and were less likely to think that doing so would have upset their doctor. In general, individuals who are experienced in using the Internet and well versed in the information available online appear to be more willing to assume greater responsibility for their own health care and to engage their doctors with information obtained over the Internet.

Future research should seek to further explore how the doctor-patient relationship affects a patient's willingness to not only seek online sources of medical information but to use information obtained over the Internet to inform discussions with health care providers. Future projects could probe how contextual variable affect the use of Internet-based health resources. For example, does use of online information in discussions with one's own doctor vary by country? Does one's relative level of experience with the health care system affect how an individual thinks their doctor will react if the patient discusses information obtained through the Internet?

The Internet is changing the ways that physicians and patients interact with one another. One of the most significant effects of the Internet is that it strengthens the patient's ability to manage his or her own health care. Two major challenges need to be overcome to achieve the full potential of the Internet. First, consumers must be assured that their privacy and confidentiality will be protected when they interact with sources of health information and services online. Second, it will be necessary to facilitate the consumer's ability to locate, interpret, and utilize Internet and web-based resources in cooperation with their health care providers (Ferguson, 2000).

REFERENCES

Anderson, J. G. (2001). CyberHealthcare: Reshaping the physician-patient relationship. *MD Computing*, *18*, 21-22.

Anderson, J. G., Eysenbach, G., & Rainey, M. R. (2002). The impact of cyberhealthcare on the physician-patient relationship. *Journal of Medical Systems*, *27*, 67-84.

Anderson, J. G., & Goodman, K. (2002). *Ethics and information technology: A case-based approach to a healthcare system in transition*. New York: Springer.

Barry, M. J. (1999). Involving patients in medical decisions. *Journal of the American Medical Association*, *282*(24), 2356-2358.

Baur, C. (2000). Limiting factors on the transformative powers of e-mail in patient-physician relationships: A critical analysis. *Health Communication*, *12*(3), 239-259.

Eysenbach, G., & Kohler, C. (2002). How do consumers search for and appraise health information on the World Wide Web? *British Medical Journal*, *324*, 573-577.

Fallis, D., & Fricke, M. (2001). Indicators of accuracy of consumer health information on the Internet. *Journal of American Medical Informatics Association*, *9*(1), 73-79.

Ferguson, T. (2000). Online patient-helpers and physicians working together: A new partnership for high quality health care. *British Medical Journal*, *321*, 1129-1132.

Fox, S., & Rainie, L. (2000). *The online health care revolution: How the web helps Americans take care of themselves*. Washington, DC: The Pew Internet & American Life Project.

Harris Interactive. (2002). *Cyberchrondriacs update*. Retrieved from www.harrisinteractive.com/harris_poll/index.asp?PID=299

Lindberg, D. A., & Humphreys, B. L. (1998). Medicine and health on the Internet: The good, the bad and the ugly. *Journal of the American Medical Association*, *28*(15), 1303-1304.

Masys, D., Baker, D., Butros, A., & Cowles, K. E. (2002). Giving patients access to their medical records via the Internet. *Journal of the American Medical Informatics Association*, *9*(2), 181-191.

McLeod, S. D. (1998). The quality of medical information on the Internet: A new public health concern. *Archives of Ophthalmology*, *116*, 1663-1665.

Pal, B. (1999). E-mail contact between doctor and patient. *British Medical Journal*, *318*, 1428.

Shepperd, S., Charnock, D., & Gann, B. (1999). Helping patients access high quality health information. *British Medical Journal*, *319*, 764-766.

Silberg, W. M., Lundberg, G. D., & Musacchio, R. A. (1997). Assessing, controlling and assuring the quality of medical information on the Internet. *Journal of the American Medical Association*, *277*, 1244-1245.

Sittig, D. F., King, S., & Hazelhurst, B. L. (2001). A survey of patient-provider e-mail communication: What do patients think? *International Journal of Medical Informatics*, *45*, 71-80.

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