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HEALTH INFORMATION VERSION 2.0: FEMALE STUDENTS IN CYBERSPACE

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Master of Sciences

by

Sonia A. Easaw

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by

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APPROVED FOR THE SCHOOL OF JOURNALISM AND MASS COMMUNICATIONS

SAN JOSÉ STATE UNIVERSITY

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ABSTRACT

HEALTH INFORMATION VERSION 2.0: FEMALE STUDENTS IN CYBERSPACE

by Sonia A. Easaw

The arrival of the Internet, one of the greatest mass media vehicles of our time, has presented a wide platform for the dissemination of health information to the American public. A majority of adults in the United States search online for information about various health and medical topics, yet a particular portion of the general public, namely college students, searches for health information online at a higher rate than the general population. Female college students especially have cause to seek information about particular women's health matters that are relevant to their age group.

This study reveals new details about the online search for women's health information among college women, with regards to the content of information searched for, the reasons behind the search, and most importantly, the health care outcomes that college women experienced after the search. Bandura's concept of self-efficacy was examined and applied in an effort to quantify an individual's likelihood of reporting that her online search resulted in a positive effect on her health. An individual's initial level of confidence before the online search was measured on a scale. It was found that a one-unit increase in self-efficacy among respondents before the search increased their odds of reporting a "major" impact on their health afterwards. The odds were increased by a factor of 2.22, or 122.22%.

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Introduction

The evolution of mass media has allowed public health education campaigns in the United States to reach more people than ever imagined. Even in 1974, before the rise of the modern day Internet, doctors realized the immense potential of the media to help communicate health information to the public. At a medical conference in 1974, when the mainstays of mass communications were television, radio, newspapers, and magazines, one physician made the following remarks to his colleagues (Barnum, 1975):

> In the day of Hippocrates the medium was mouth-to-ear within a small restricted circle of fellows. Today the media are many, extending to the limits only of earth and air. Let us use the new media often, wisely, well, and to the ultimate benefit of our patient, the public. And let us begin now. (p. 26)

His words, though spoken 35 years ago, have become even more significant today—what medium is more expansive, "extending to the limits only of earth and air" (p. 26), than the modern-day Internet? Consequently, the possibilities of public health education today are greater than ever before because of the extensive reach of the Internet. And these possibilities are being realized everyday in the plethora of online health websites available to the public at a click of a button, and in the ever-increasing numbers of Americans who are downloading this online health information. In 2008, as more Americans gained access to the Internet, the popularity of using the Internet as a health information resource increased so much it became one of the top online activities (Fox, 2009). And to substantiate its popularity, the latest statistic in 2008 has revealed that 61% of all Americans ages 18 years or older have used the Internet for health information (Fox, 2009).

It has now been more than a decade since researchers realized the incredible power of the Internet to aid in health communications, and began to write about it. In 1998, Robinson, Patrick, Eng, and Gustafson wrote the following: “The challenge of the next decade will be to transcend the surface appeal of these technologies and to understand and harness their power to improve the health of individuals and communities” (p. 1268). Since then, a body of literature has begun accumulating over the last decade, consisting of extensive research on the individuals who look for health information, and their reasons for doing so. Important issues of trust and reliability of online health information have also been addressed. Even potential outcomes of Internet health technologies have begun to be studied, in an attempt “to understand and harness their power” upon the public’s health. This is perhaps the most important end-result—to discover what health outcomes may arise for the individual who looks online for health information (Cline & Haynes, 2001). However, the analysis of health outcomes is often difficult to measure, and the literature has only begun to address it.

Overall, the existing literature is of a broad, general nature because it mainly surveys the Internet health-seeking habits of the entire American population. Though this introductory information is essential to deeper research, it cannot end there. Instead, it must act as a precursor to upcoming research that will focus on the microcosms of the American population who most frequently look for online health information. By what better way to analyze the process and outcomes of a behavior than by studying those who engage in it the most?

Prior research has already shown that more women than men look up health information online (Fox, 2009), and this fact has generated studies that have analyzed this behavior just among women. College students have also been shown to frequently use the Internet to find health information, yet only a few studies have analyzed their behavior (Escoffery et al., 2005; Hanauer, Dibble, Fortin, & Col, 2004; Sole, Stuart, & Deichen, 2006). The types of health information that college students seek, their reasons for using the Internet to find health information, and the potential impacts on their health can eventually have serious implications for the design and efficacy of public health communications and social marketing that are geared towards the college population and young adults.

An even more significant gap in the literature does not address the online-health-search habits among individuals who identify with both groups: *female* college students. Women who are in college are usually between the ages of 18 and 24 (U.S. Department of Education, 2008), and this age group of women especially confronts many sexual and reproductive issues that are common to most young women (National Center for Health Statistics, 2008). Information about sexual and reproductive information-seeking habits of college-age women can have profound effects on public health campaigns that are geared towards young women.

The present study, called [“Female students in cyberspace” for ease of reference, abbreviated (FSIC)], of participants who were both female and in college was done because these individuals had a great propensity to look for health information online, and the analysis of their behavior revealed significant information about this process and most importantly, its effects on their personal health care choices. A theoretical framework that has been used in the past to understand the health behavior of individuals in general was applied to this study of female college students. This is Bandura's concept of self-efficacy, applying specifically to self-efficacy with regards to personal health promotion in an individual.

His basic concept of perceived self-efficacy (1998) "refers to beliefs in one's capabilities to organize and execute the courses of action required to produce given levels of attainments" (p. 3). He extended this idea of an individual's belief in his or her own capabilities to produce a desired effect to the belief in an individual's power to affect his or her health. Bandura (1998) hypothesized that "The stronger the perceived self-efficacy, the more likely are people to enlist and sustain the effort needed to adopt and maintain health-promoting behavior" (p. 5). The previous statement suggests that an individual's level of personal efficacy can influence his or her perception about personal health impact. The present study applied this concept to understand the relationship between self-efficacy beliefs among college women and its resulting impacts on their health.

A quantitative research study was performed to assess the process and possible health outcomes among female college students who search for health information online. In an effort to quantitatively measure the research questions behind the study, a questionnaire was created and distributed to female students at a large Western

University, and the data from the responses were entered into the statistical program SPSS and then analyzed. Each section of the survey was designed to ascertain specific information from the respondent, especially information about the types of health information they might look for online, their reasons for doing so, and what changes they might make to their personal health care routine. Finally, the relationship between a respondent's self-efficacy and her indication of an impact on her health was quantitatively assessed through a multinomial logistic regression statistical test.

Literature

Prior literature provides an excellent foundation for the present study (FSIC) because of its generality in scope and its introductory findings. The first section of the literature review introduces the concept of the online health information search by exploring its background and processes. Next, the individuals who participate in this activity are described, with a focus on women and college students in particular. The existing research on possible health outcomes of this behavior is then explored, along with a discussion of the study's theoretical framework of self-efficacy within individual health promotion. The literature review concludes with FSIC's research questions.

Health and the Internet

The communication of health information to the public changed forever with the arrival of Internet technologies (Cline & Haynes, 2001; Robinson, 1998). But only about two decades ago, the rudimentary networks of electronic communication were just beginning to be imagined. And the fruition of these imaginative ideas—the Internet—has indeed become what Neuman (1991) predicted to be a "universal Alexandrian library" (p. 37). Yet the Internet is not only a source of virtually limitless knowledge, but it also provides an element of interactivity, or "two-way communication in an intelligent system" (Neuman, 1991, p. 69). Robinson (1998) wrote that *interactive* health communication is defined by the following: "the interaction of an individual—consumer, patient, caregiver, or professional—with or through an electronic device or communication technology to access or transmit health information or to receive guidance and support on a health-related issue (p. 1264)."

This definition suggests that the very interactive nature of the Internet would transform how people received health information. Cline and Haynes (2001) concurred with Robinson on this very point, as shown within the following words: “To view Internet use as a communicative process activating social influence suggests shifting focus from information to messages and meanings” (p. 687). This would entail going beyond the initial research that has considered the Internet health information itself and its issues of accuracy. Questions of the credibility of medical information online and an individual’s trust in that information are important and will be addressed in the following sections. But ultimately, just as Cline and Haynes (2001) wrote, the focus should be on the meaning and significance of the information upon the individual’s life. This will allow research to transcend the surface level and attempt to understand how Internet health information can affect an individual’s health behavior. This important concept became the focus of FSIC.

The process. More Americans now have the opportunity to visit online health websites because of the dramatic increase in Internet access. There are many reasons for this upward shift in accessibility, including faster, more reliable Internet connections, increasing use of the Internet in schools and workplaces, and the overall integration of the Internet into everyday life (Cline & Haynes, 2001). The Pew Internet & American Life Project began surveying Americans about their Internet health-seeking habits in the year 2000, and found that 46% of adults had access to the Internet. At that time, 25% of American adults searched online for information about health. A decade later, in 2008, 74% of Americans had Internet access, and 61% of adult Americans used the Internet for health purposes (Fox, 2009).

Individuals who desire to find health information on the Internet largely type their search query into an Internet search engine, such as Google, that will scour the World Wide Web for those search terms, or they look directly within highly credible websites such as WebMD.com for their search topic. The Pew Internet Project in 2006 found that 66% of American health seekers began their search at a general search engine such as Google or Yahoo. For younger health seekers, this percentage is even higher--74% of health seekers between the ages of 18 and 29 began their health query at a search engine (Fox, 2006). No matter how they begin their search—either through a search engine or by going to a particular website—most American adult health seekers will visit at least two health websites per health information-searching session (Fox, 2006). But locating the information is just the beginning—how can the individual know if that information is accurate? This very issue has been seriously examined in the existing literature and continues to be a topic of major concern.

Trust and reliability. About a decade ago, when many individuals first began to use the Internet to find health information, government health organizations recognized the importance of making sure this online information was accurate. *Healthy People 2010*, a bulletin published in the year 2000, contained certain objectives designed to improve the health of Americans over the decade; one of its goals was to increase the number of health websites that fully credited the source of the information displayed and its validity (U.S. Department of Health & Human Services [HHS], 2000). And today, after ten years of examining this goal, *Healthy People 2020* (to be published in 2010) has retained this objective but made it more specific, demanding more websites that “meet three or more evaluation criteria” and that “follow established usability principles” (HHS, 2010). Thus, the importance of accurate online health information has only become greater ten years later as this objective becomes more specific.

Yet what do these specifications really signify, or what exact information should a website display to verify the accuracy of its health information? In 1998, physicians and other medical professionals tried to create a system of instruments that could measure the accuracy and validity of online health information, in an effort to protect the consumer from misleading or inaccurate information. Yet the overall conclusion was that the information present on the Internet is too dynamic, ever-changing, and expansive to monitor its quality levels—the final message being that the individual should take caution when searching the Internet for this information (Jadad & Gagliardi, 1998).

Since the *Healthy People 2010* publication in 2000, studies have shown that Internet health-information-seekers do not always check for sources of credibility when looking at health websites. Also, results have shown that different attributions to credible and non-credible sources did not affect the health-seeker's perception of the quality of the site's content (Bates, Romina, Ahmed & Hopson, 2005; Fox, 2006).

Even a higher level of web experience and searching skills may not make the health information search any easier (Keselman, Browne,& Kaufman, 2008). Many college-age respondents in a 2005 survey who described their Internet research skills as good or excellent were unable to conduct advanced health information searches, and only half of the respondents in the study were able to accurately gauge the trustworthiness of particular websites (Ivanitskaya, O'Boyle, & Simms, 2006).

Yet some young people are aware of this issue of credibility of health websites. Participants of a study, ages 11-19 years, said that they often cross-check the validity of health content online with a trusted member of the family or a trusted peer with whom they would speak about their health inquiry even before searching online (Gray, Klein, Noyce, Sesselberg, & Cantrill, 2005). But despite the number of individuals who do verify the validity of the site, the issue remains that not all individuals do so.

Despite the concern for accuracy of online health information, the literature has reached a consensus that it might be impossible to stipulate the quality of information levels or to thoroughly judge the accuracy of the immense amount of health information online (Bernstam et al., 2008). Instead, the message remains the same as what was determined a decade earlier—let the consumer beware of inaccurate information and proceed with caution in his or her online health search.

In an effort to better understand the online health seeker, the following section addresses this population’s general characteristics, paying special attention to the characteristics of women and college students who engage in this behavior.

Online Health Seekers

Overview. Though the population of online-health-seekers (who will be identified as “e-patients”) is varied and multi-faceted, there are a few traits, such as education level, health status, and age that these individuals hold in common. In terms of education level, most e-patients have attended college and are highly experienced with using the Internet (Cotten & Gupta, 2004; Fox, 2006; Rice, 2006). Also, e-patients have been found to be younger compared to offline patients, with an average age of 40 vs. 52 years (Cotten & Gupta, 2004). The 2008 Pew study of e-patients corroborated this fact that younger individuals often search the Internet more than do older ones; the highest percentage of respondents who went online for health information were those ages 18-29, at 72% (Fox & Jones, 2009).

The health status of the individual may also affect their online health search or the reasons behind it. Yet studies have differed in their results--one group of studies asserted that the presence of chronic illness or poor health in individuals caused them to look for health information at a higher rate than healthy people (Ayers & Kronenfeld, 2007; Bundorf, Wagner, Singer, & Baker, 2006; Rice, 2006;). Other studies have found that health status did not influence a person's online health search habits (Atkinson, Saperstein, & Pleis, 2009; Cotten & Gupta, 2006; Liszka, Steyer, & Hueston, 2006).

Women. One of the only consistent demographic factors to emerge in the literature is that gender plays a pivotal role in this behavior; more women than men look up health information online (Atkinson et al., 2009; Bundorf et al., 2006; Cotten & Gupta, 2004; Fox & Jones, 2009; Lorence, Park, & Fox, 2006; Rice, 2006). This greater need among women for health information is complex and difficult to describe, but may be because women have traditionally sought more health care services in the past, such as making visits to a primary care physician or for diagnostic tests. Also, women often self-report poorer health than men do, which might influence their frequency of medical care visits (Bertakis, Azari, Helms, Callahan, & Robbins, 2000; Muller, 1990).

Women usually go online to search for health information for them or for another person (Fox & Jones, 2009; Warner & Procaccino, 2007). This information search can take place before or after a visit to a physician, or it could be unrelated to seeing a physician (Pandey et al., 2003; Warner & Procaccino, 2007).

Women who have been diagnosed with a health condition may also go online to search for health information about possible treatment options. Cowan and Hoskins (2007) found that the most frequently used source within the mass media for information about chemotherapy options for women with breast cancer was the Internet, especially for women under the age of 50. The Internet was also heavily utilized among women diagnosed with uterine fibroids, to aid in their search for treatment options (Ankem, 2007).

Women who are conscious about the quality of their health may be active in finding preventive health information online. Pandey et al. (2003) found that among a sample of New Jersey female respondents primarily between the ages of 18 and 25, those who were concerned about their health and actively participated in maintaining their health (named "health conscious") were more likely to look online for health information than those who were not as health conscious in that particular study. A study by Cotten and Gupta (2004) found a similar result among a nationally representative sample of American males and females—those e-patients who had been deemed "healthy" in the study were found to look for health information more often than did offline patients. Overall, it was established that the group of female e-patients were more active seekers of health advice than the group of women who did not seek for information about health online (Pandey et al., 2003; Warner & Procaccino, 2004; Warner & Procaccino, 2007).

College students. A growing body of research has examined the process that college students go through when looking for health information on the Internet (Escoffery et al., 2005; Hanauer, Dibble, Fortin, & Col, 2004; Sole, Stuart, & Deichen, 2006). Escoffery et al. (2005) found that 74% of college students looked up health information online in the fall of 2002 and spring of 2003. This percentage of college students is higher than the percentage of adults (61%) nationwide who searched for health information online in 2008—about five years later (Fox & Jones, 2009). This may be in part due to the near-constant access to the Internet now widely available at academic institutions and residence hall facilities, growing expectations of online participation in class, and the growing use of social networking available online to college students. This integration of the Internet into daily life has made it easier for them to use the Internet for research purposes and to access electronic library materials—73% of college students in 2002 used the Internet more than the library for information-searching (Jones, 2002).

College students, like most e-patients, begin their online health search by entering queries into a search engine, or by visiting highly credible health sites such as WebMD.com (Escoffery et al., 2005). Major search topics included fitness or exercise, diet or nutrition, sexual health, and sexually transmitted diseases (Escoffery et al., 2005; Baxter, Egbert, & Ho, 2008).

Women in college. Women now make up the majority of the U.S. undergraduate population—the greater proportion of women than men in college is a continuation of a steady increase in female enrollment that began in the 1970s. They went from being the minority in 1970—at 42%, to the majority in 2001—at 56% [National Center for Education Statistics (NCES), 2005]. And just as prior studies have indicated that more women look up health information online than men—the same gender distribution exists among college students. It has been shown that more female college students engage in this behavior than their male counterparts (Escoffery et al., 2005; Fogel & Solomon, 2009; Sole, Stuart, & Deichen, 2006). In a study done by Escoffery et al. (2005), 78% of college females obtained Internet health information, compared to 67% of college males.

Young women's health. The percentage of female college students has been rising in the past few decades, and so have the percentages of female undergraduates ages 18-23 (55% in 2000) and ages 24-29 (54% in 2000). The age range of 18-29 years is a critical time period for young female undergraduates to make preventative choices about sexual and reproductive health (National Center for Health Statistics, 2008), and so the process of the online health search becomes even more relevant. This is partly because many American women have engaged in sexual intercourse before attending college, or experienced their first sexual experiences while enrolled in college. In 2002, 71% of American women between the ages of 18 and 19 had sexual intercourse, and 87% of women ages 20 to 24 had sexual intercourse (U.S. Department of Health and Human Services, 2005).

There are specific health concerns that young women who are sexually active must address, such as their high risk for sexually transmitted infections (STIs) and the occurrence of unwanted pregnancies (U.S. Dept. of Health and Human Services, 2008). Regular checkups and pelvic exams, and adequate information about protection such as condoms or birth control pills, are vital to ensuring sexual and reproductive health for young women (U.S. Dept. of Health and Human Services, 2008). Also, the vaccine for diseases caused by certain types of genital human papillomavirus (HPV) is recommended for women between the ages of 13 and 26. Because this vaccine was only released in 2006, many young women might not know enough about the vaccine and could question why they need it (U.S. Dept. of Health and Human Services, 2008).

Young women in college are likely to find more about this type of sexual and reproductive information on the Internet. Sexual and reproductive health information is often sensitive material, and some women may prefer to search privately and anonymously on the Internet for this type of information. They may also wish to double check the validity of certain sexual health information that is commonly misconstrued, such as issues of emergency contraception and pregnancy risk (Wynn, Foster, & Trussell, 2009). Other stigmatized illnesses such as depression, anxiety, urinary incontinence, and herpes led respondents to indicate a preference to use the Internet to look for information about these health conditions (Berger, Wagner, & Baker, 2005).

General issues regarding the consequent health outcomes of the online-health-search are addressed in the following section. Ultimately, this presentation of health outcomes that have been addressed in the existing literature is used to inform FSIC’s analysis of its particular population of female college students—a population that has not been studied in-depth before.

Outcomes

The information female college students find on the Internet is likely to impact their personal and sexual health choices, making the analysis of their online health search habits highly relevant to matters of public health. Cline and Haynes (2001) found that little research had been done on the *effects* of seeking health information on the Internet. Today, this remains the case as well—though much progress has been made in studying other areas, such as the demographics of e-patients and the credibility of health websites, little research has addressed the outcomes of the online health search.

Follow-up health visits. One way to measure health outcomes is to assess whether the e-patient looks for online-health-information in conjunction with a visit to a physician, such as seeing a doctor before or after conducting the search and asking questions pertaining to the search. Respondents in the 2008 Pew study who reported an impact were asked to categorize it, especially according to whether or not they made follow-up visits to a physician; 53% said it led them to ask their doctor new questions or get a second opinion, and 38% said it affected a decision about whether to see a doctor (Fox, 2009). Similar studies have shown that about half of respondents shared the information they found online with their health care providers (Liszka et al., 2006; Ybarra & Suman, 2006).

But the role of the physician in the online health search among college students—whether or not college students consult the Internet before or after seeking medical advice from a health professional—was found to be smaller than among the general population of e-patients. Escoffery et al. (2005) found no substantial influence of health care providers on college students’ online health search; only about 25% of respondents reported speaking with a physician about the information they had found online.

Change in health management. Another observable outcome that may occur after an individual’s online health search is a change in personal health care management or behavior. A large majority of female respondents within the Warner and Procaccino (2004, 2007) studies felt that the information they found online affected their decisions about health treatment options and improved their eating or exercise habits. Improvement in nutrition and other issues of preventive medicine such as diet and fitness were shown to be common behavioral changes among women after they had searched about these topics online.

The majority of the same respondents confirmed that the health information search positively affected their health behaviors (Liszka et al., 2006; Warner & Procaccino, 2004, 2007). Overall, a large number of women who searched the Internet for health information found that the search answered most of their questions and provided a high level of satisfaction (Warner & Procaccino, 2004; Ankem, 2007; Cowan & Hoskins, 2007; Warner & Procaccino, 2007).

Changes in health management also occurred among college students in the study by Escoffery et al.; about 37% of respondents reported that their search improved the way they managed their health "a lot" or "some" (2005). A similar study analyzed the effects of a website "triage" program, where college students could find health information or e-mail physicians about their health concerns, and be advised whether or not to visit the student health center. The initial evaluation of the website indicated high use and accuracy of Web-based triage (Sole, Stuart, & Deichen, 2006).

Self-efficacy. The underlying reasons behind a pro-active change in personal health care behavior stem from an individual's belief in his or her capabilities to alter future health outcomes for the better. This individual's belief constitutes what Bandura (1977) has labeled "self-efficacy. Self-efficacy is defined as the amount of confidence one has in successfully achieving desired outcomes and can determine how much effort a person exerts in the face of obstacles (Bandura, 1977). This belief in self-efficacy, or the belief that one has control over his or her health, can influence an individual's motivations behind the online health search (Bandura, 2004; Bass et al., 2006; Lee, Hwang, Hawkins, & Pingree, 2008).

In turn, an individual's online search habits may yield changes in personal health care behavior if the individual believes that desirable outcomes are possible to achieve. Thus, beliefs of self-efficacy can directly affect health behavior by shaping the outcomes that people expect their efforts to produce (Bandura, 2004). For example, a study of chronically ill patients who believed they could change their health for the better via a chronic disease self-management program achieved an improved health status and decreased their number of hospitalizations (Lorig et al., 1999). Bass et al. (2006) also found that self-efficacy was positively and significantly related to Internet health information use, specifically the self-efficacy variables of actively participating in treatment decisions, asking physician questions, and sharing feelings of concern.

There are scales that have been constructed and validated for the purpose of attempting to aid in the measurement of self-efficacy. Sherer et al. (1982) constructed a self-efficacy scale that aimed to measure the concept of general self-efficacy. The scale included questions such as "When I make plans, I am certain I can make them work" or "I give up easily" (p. 666). Yet this scale was not intended to replace more specific measures that assess expectations for specific target behaviors—if such specific behaviors are to be analyzed, "more specifically worded questions or direct behavioral measures are likely to provide the most accurate estimates of an individual's self-efficacy expectations (p. 671)." FSIC used general measures of self-efficacy, but also used more specific items that measured a respondent’s self-efficacy towards health promotion or health care change.

Research Questions

The existing literature provides a critical foundation and the necessary background information for FCIS. Without this information on the general characteristics of e-patients, particular those of college students and women, there would be no direction for FSIC that studies this behavior among female college students—a population that has not been studied before in-depth.

Prior studies have revealed the health topics of interest that women in particular search for online, such as nutrition, diet, fitness, and specific medical conditions. These highlighted health topics that women search for are essential in understanding the resulting changes in their personal health care. FCIS uses this prior research to inform its analysis of the types of health information that college women in particular look for. This is the primary reason for the first research question: What types of online health information do female college students look for? Because this population has not been analyzed in depth, certain relevant women's health issues have not been discussed in the existing literature. It is for this reason that an introductory survey of this information was provided in the literature review so that these issues could be incorporated into FCIS.

In addition to the types of online health information searched for, the reasons behind doing so are important for understanding the consequential health outcomes of the online health search. Prior studies have identified some of these reasons, such as an individual's desire to find specific information about a medical condition that he or she may have. This prior research has been used as background information for the focus of the second research question: Why do female college students look for health information online? Of particular consideration to the present study are the reasons for the online health search with regards to women's health issues—something that has not been analyzed before.

The first two research questions provide the necessary information to explore the focus of the third question—How does the health information they find influence their health care behavior? This final question lends significance and meaning to FSIC because these results are vital to understanding how college women use the health information they find. This information can be then used to design online public health campaigns that are especially targeted to them. Their personal beliefs of efficacy, both in general ways and with regards to improving their health, will also be assessed to understand how this may play a role in their personal health outcomes.

A summary of FCIS's research questions is listed below.

RQ1: What types of online health information do female college students look for?

RQ2: Why do female college students look for health information online?

RQ3: How does the health information they find influence their health care behavior?

Method

Participants

The participants of FCIS, or survey respondents, were female college students who volunteered their time to complete the FSIC questionnaire. Survey recruitment was restricted to include only female respondents because of FSIC's purpose to examine how women in particular find health information online. Respondents were recruited in-person at different locations of the campus. As a gesture of appreciation for their participation, they were offered refreshment and an opportunity to enter a contest for a special prize. There were four respondents who either did not complete the initial survey questions regarding Internet access and usage, or marked that they did not use the Internet. These respondents were thus excluded from data analysis because the next three sections of the survey assumed at least occasional Internet usage. The final number of survey respondents was 321.

The ages of respondents fell between 18 and 54 years (*M* = 22.7, *SD* = 4.96). The majority (60.5%) of respondents were between the ages of 19 and 22. Many of the respondents were Asian or Pacific Islander (35.7%), White (28.2 %), or Hispanic/Latino (18.5%). The remaining respondents indicated their ethnicity to be Multi-racial (10.3%), African-American (4.7%) or Other/Unknown (2.2%). Respondents also indicated their student degree program, with undergraduates composing the majority (89.6%), graduate students composing 7.2%, with the remaining being enrolled in the Open University program (1.3%) or Other (1.9%).

Categories of major or program of study included Health Sciences/Nursing (32.6%), Business (18.2%), Humanities (12.2%), Physical/Biological Sciences (6.3%), and Engineering (2.5%). Respondents could also indicate their major or program of study to be “Other” (28.2%), and were subsequently asked to further specify in their own words. Their answers fell among the following categories: Applied Sciences & Arts (33.3%), Social Sciences (26.4%), Humanities and the Arts (16.0 %), Education (10.3%), Double Major (9.2 %), and Other (4.6 %).

Respondents were also asked to report their relationship status to be single (35.4%); single, dating casually (6.3%); single, dating one person exclusively (38.2%); living with my partner (7.2%); married/committed (11%); divorced (0.3%); and other (1.6%). Finally, living situation was characterized according to live off-campus with parents/relatives/family (47.6%), live off-campus with roommates (28.8%), live on-campus in student campus housing (14.4%), and other (9.1%).

Procedures and Materials

FCIS’s method for data collection was a questionnaire (see Appendix A) that was distributed in-person to female university students. The questionnaire was distributed in-person rather than electronically because of time constraints—the goal was to recruit as many respondents in as short a time as possible. Survey distribution began only upon receipt of approval from the University’s Institutional Review Board. Students were recruited in two areas of the campus: in front of the main student center (with permission from the student services office), and inside the student health center with their permission. A small number of students were also recruited from journalism and mass communication classes with the permission of the instructor. The total amount of surveys distributed was 325. About 120 surveys were completed at the student health center, about 30 surveys completed within student classes, and the rest (about 175) surveys were taken outside of the student center.

The primary researcher conducted the administration of all surveys to ensure the most professional, anonymous, and confidential experience for the respondent. The top form of the survey consisted of the disclosure form (see Appendix B) that respondents were instructed to tear off and keep for their records. After completing the survey, respondents were instructed to place their survey into a designated slotted box. They were not asked to indicate any identifying information, such as name or contact information, throughout the entirety of the survey.

The primary researcher used a number of incentives and techniques to draw potential respondents to the table to take the survey, both outside of the student center and inside the student health center. Chocolate and granola bars were strategically placed on the table to attract female students. Next, a drawing for a free small purse was advertised. Finally, an attractive poster was draped on the table to draw the attention of passing female students and to advertise the previously mentioned incentives.

The primary researcher recruited respondents in university journalism and mass communication classrooms with the permission of the instructor. Refreshments were provided to respondents and the chance to enter the raffle for the small purse was also extended to them.

Survey design. The survey itself was divided into five sections. The first section contained questions concerning Internet access and usage that were critical to the rest of the survey—if the respondent did not use the Internet, then the rest of the survey questions about using the Internet to find health information would not apply to that particular individual. The second section was designed to explore the overall process of the online health search and specifically what types of health information, particularly sexual and reproductive health information that the respondent had searched for.

The third section involved questions of self-efficacy, both in everyday life and in regards to the achievement of personal health goals as a result of the online health search. The fourth section dealt with questions of individual outcomes that resulted from looking for health information on the Internet. These questions that concerned health outcomes were crucial to understanding the possible effects of this online health search process, and also to connect the respondent's level of self-efficacy, particularly towards health matters, to the impact of their search. The final section was designed to explore the demographic information of the respondent, including ethnicity, living situation, and relationship status.

The survey questions consisted of both open-ended and closed-ended questions that were often used in conjunction with each other. For example, the respondent was instructed to answer "yes," "no," or "unsure" for certain questions, yet after each of these three options there was a blank space available for the respondent to elaborate upon their answer. Other survey questions incorporated Likert scales that were used primarily in questions concerning self-efficacy, and Cronbach's alpha was used to measure the internal reliability of self-efficacy scales. Additionally, matrix-styled questions were used when exploring types of online health information and the resulting health outcomes of the online-health-search.

Measures

Internet access and usage. The questionnaire opened with measures of Internet access and usage. Respondents were asked if they used the Internet, at least occasionally. Only surveys that marked “yes” (*N* = 321) were included because an affirmative response was critical in assessing the participants’ subsequent answers.

Responses to questions regarding the place where the Internet was most often accessed and the daily amount of Internet usage provided information about the respondent’s level of Internet interactivity. The majority of respondents (88%) accessed the Internet most often from home, while the remaining responses included school (7%), work (2%), and other (3.4%). Those who marked “other” mentioned more than one place of access or continuous access via a mobile phone.

Most used the Internet for 2.5 to 3.5 hours per day (37 %); others chose among 4 to 5 hours per day (26.6 %), 1 to 2 hours per day (20.4 %), more than 6 hours per day (13.2 %), 0 to 0.5 hours per day (1.9%), and other (1%).

Types of online health issues. A matrix-styled question (see Appendix A, survey question 6) beginning with the phrase “have you ever looked online for information about…” grouped 15 common health information topics from among which the respondent could mark “yes,” “no,” or “unsure” for each topic. This style of questioning provided better readability and an efficient use of the respondent’s time because of the consolidation of responses. This question ultimately served to answer the first research question that inquired about the types of health information female college students may look for online. The information categories were deliberately chosen to address topics previously shown by prior studies (Pandey et al., 2003; Fox, 2006; & Warner & Procaccino, 2007) to be of special importance to women, such as (1) “nutrition/diet/exercise,” (2) “specific medical diseases or conditions,” and (3) “minor illness.” Increased justification for category choice arose from prior studies (Baxter et al., 2008; Hanauer et al., 2004; & Escoffery et al., 2005) that have shown these topics to be especially important to women in college.

Health care history. A general representation of the respondent’s health care history was desired to establish a basic assessment of their health status. Respondents were asked to gauge the quality of their own health on a scale of (1) *excellent,* (2) *good*, (3) *only fair*, (4) *poor*, and (5) *other*. It was found that most respondents (65.6%) reported their health to be *good*. This was followed by 16.6% who marked *excellent*, 16.6% who marked *only fair*, and 1.3 % who marked *poor*.

Respondents were then asked “in the last 12 months, have you seen a physician or other health care professional for a medical visit, either for regular health care check-ups or for medical emergencies?” A large majority of respondents (N = 261) marked (a) “yes,” equaling to 81.6% of respondents; the remaining respondents marked either (b) “no” (17.2 %) or (c) “unsure” (1.3%). Nearly all of those who marked “yes” provided additional information to their response, explaining the reason or underlying issue of the visit. These responses were then coded into separate categories (see Appendix C for detailed coding instructions). The number one reason for visiting a health care professional within the last year was for a general check-up; the other main reasons are described in Table 1.

Table 1

Reasons for Health Care Visits Made in the Last Year

	Single Reason		Two Reasons			
			First		Second	
Category	*n*	%	*n*	%	*n*	%
General health check-up (e.g., annual physical)	99	51.03	27	42.86	10	15.87
Illness (e.g., cold)	29	14.95	9	14.29	13	20.63
Women's health (e.g., pap smear)	22	11.34	13	20.63	14	22.22
Chronic Illness (e.g., diabetes)	9	4.64	2	3.17	2	3.17
Immunization (e.g., flu shot)	8	4.12	2	3.17	6	9.52
Other	8	4.12	0	0.00	2	3.17
Injury (e.g., fracture)	5	2.58	4	6.35	5	7.94
Remaining	14	7.22	6	9.52	11	17.46
Total	194	100	63	100	63	100

Among those respondents who marked “no” to making a health visit in the last year (*n* = 55), 27 of them gave reasons for their answer. It was found that about half (48.15 %) had not seen a health professional because they reported good health, while 37% lacked health insurance and 14.81% listed some other reason.

Reasons behind online health search. Question number seven asked respondents if within the last year “did you go online to look for information related to your *own health* or medical situation or *someone else’s* health or medical situation?” The structure and wording of this question was directly taken from the 2006 Pew study (Fox, 2006) and the 2007 survey administered to women by Warner and Proccacino (2007). Yet the open-ended nature of the question included in FCIS allowed for an analysis of responses to reveal possible reasons behind the search.

The initial coding categories indicated for who or whom the online health search was conducted; they included (1) the respondent, (2) someone else, (3) both the respondent and someone else, and (4) unspecified individual. The remaining categories to follow were constructed according to the type of health information that was searched for such as (1) general health, (2) women’s sexual or reproductive health, (3) a specific disease or medical condition and (4) nutrition, diet, or exercise. The only category present that was distinct from previous coding instructions of prior questions was entitled “schoolwork purposes,” and involved a search for the purposes of a school project or the learning curriculum for nursing students.

Self-efficacy. The theoretical framework of FSIC lies in the concept of self-efficacy and its relationship to the health impacts of an online-health-search. Self-efficacy, in its most basic form, is described to be “people’s beliefs about their capabilities to exercise control over events that affect their lives” (Bandura, 1989, p. 1175). A total of eight Likert-type indexes were used, including five indexes of general self-efficacy and three indexes of self-efficacy in regard to health promotion. A five-point scale was used that allowed for responses ranging from (a) *strongly disagree*, (b) *disagree*, (c) *neither disagree or agree*, (d) *agree*, and (e) *strongly agree.* Five items measured the self-efficacy of the individual in a general way, without reference to health promotion. For ease of reference, this will be referred to as the general self-efficacy (genSE) scale. The presence of the five general items that each measured the same variable of self-efficacy allowed for an assessment of the internal consistency reliability (Cronbach’s α) of this continuous variable. It was found that reliability was the highest ($\alpha = 0.76$) when the second item (“if someone opposes me, I can find the means and ways to get what I want” was removed. The final scale genSE ($M = 4.13$; $SD = 0.58$) was created using the remaining four items. These four items that make up the genSE scale are listed below:

1. I can always manage to solve difficult problems if I try hard enough.
2. I am confident that I can deal efficiently with unexpected events.
3. I can solve most problems if I invest the necessary effort.
4. When I am confronted with a problem, I can usually find several solutions.

The final three self-efficacy items measured self-efficacy with regards to health promotion. When combining the three items into a scale, it was found that the removal of one item ("I am confident that I have the power to affect my own health through my behavior, whether good or bad) created the highest reliability ($\alpha = 0.70$). The remaining two items measured self-efficacy with regards to the online health search, and will be called the online health search self-efficacy (ohs_SE) scale for ease of reference. The ohs_SE scale consisted of the following two items: (1) "I am confident in my Internet searching skills when it comes to looking for health information online," and (2) "looking for health information online will help me achieve my personal health goals."

Outcomes of online health search. The outcomes of the online health search were measured in the following five ways:

1. The results of question 17 ("Did the health information you found online have a *major* impact on your health, a *minor* impact, or *no impact* at all?")
2. An analysis of the open-ended responses to question 17.
3. Follow-up visits to a health care professional as measured by the question "Thinking about the last time you went online for health or medical information…did you later talk with a doctor or other health care professional about the information you found online?"
4. The resulting health behavioral changes as measured by the question "In which of the following ways, if any, did the health information you found online affect your own health care routine?"
5. The results of the binomial regression test between independent variables genSE and ohs_SE, and the dependent variable hlthOUT.

Analysis of major and minor health impacts. The following eight categories (for more detailed coding instructions, see Appendix D) were used to describe issues involving a major impact on personal health: (1) “knowledge increase: general,” (2) “treatment change,” (3) “drug regimen change,” (4) “health visit made,” (5) “knowledge increase: surgery,” (6) “knowledge increase: chronic illness,” and (7) “knowledge increase: illness.” Coding instructions for the category entitled “knowledge increase: general” included greater awareness of personal health and better understanding of general health information.

“Minor impact” responses were coded similarly to the “major impact” responses (please see above paragraph). However, a separate category entitled “distrust of online health information” was designated to accommodate responses indicating the participant’s doubt in the credibility, reliability, or accuracy of Internet information. For more detailed coding instructions, see Appendix D.

Consulting with health professional after online health search. One commonly used measure of impact asks the respondent if a follow-up visit was made with a health professional about the information found; this measure has been analyzed several times in prior studies (Warner & Procaccino, 2004; Nicholson, Gardner, Grason, & Powe, 2005; Liszka et al., 2006; Ybarra & Suman, 2006; & Warner & Procaccino, 2007). Specifically, the respondent was asked about their latest online search—“did you later talk with a doctor or other health care professional about the information you found online?” As in previous questions, respondents were encouraged to write an open-ended response for clarification purposes. Those reasons indicating a “yes” response included follow-up visits concerning (1) general health, (2) women's health, (3) illness, (4) treatment, (5) mental health, (6) chronic illness, and (7) preventive medicine. Please see Appendix G for further clarification.

Entirely different coding instructions were made for the analysis of "no" responses to arranging a follow-up health visit. The reasons for choosing not to seek a follow-up health visit were coded as follows: (1) unnecessary to ask, (2) unable to ask, (3) search concerned someone else, (4) unspecified, (5) search conducted after a health visit, (6) search strictly informational, and (7) problem resolved itself. Those that marked "unnecessary to ask" found adequate information online to solve their question, could not locate the correct health information, or could not find enough information applicable to their health situation. Further details on coding instructions are located in Appendix E.

Types of outcomes. A question used to measure specific behavioral changes made after the online health search was presented in a clear and effective matrix-styled format to make the answering process easier and more effective. Potential health outcomes listed in the matrix included the following options: (1) "affect your decision about how to treat a medical illness or condition," (2) "change your overall approach to maintaining your health," (3) "change your overall approach to maintaining your health," and (4) "lead you to ask a doctor/health professional new questions" (see Appendix A, question 18).

Of particular importance to the study were behavioral changes made regarding issues of women's sexual//reproductive health; they were measured by the following options: (1) "impact a decision of yours to get tested for sexually transmitted infections (STI's)," (2) “impact a decision of yours to get the HPV vaccine,” and (3)“change the way you are sexually intimate with a partner.”

Relationship between self-efficacy and impact of online search. A logistic regression test was performed to predict a dependent variable (to be called hlthOUT for ease of reference) on the basis of two continuous, independent variables (genSE and ohs_SE). The variable hlthOUT comes from survey question 17: “Did the health information you found online have a *major* impact on your health, a *minor* impact, or *no impact* at all?”.

The variable hlthOUT is a polytomous dependent variable, because it contains more than two classes: [(1) “major impact,” (2) “minor impact,” and (3) “no impact.”] Therefore, a multinomial logistic regression will be performed as opposed to a binary logistic regression where the dependent variable must be dichotomous (Garson, 2010). The reference category can be custom determined in SPSS, and because “minor impact” (*n* = 192, 60.6%) contained the most responses (UCLA Academic Technology Services, *n.d.*), it was chosen as the reference category.

A significance test for the multinomial logistic regression was analyzed to measure how well the model fits the data. The significance test for multinomial regression is called the “likelihood ratio test” or the “log likelihood ratio test.” The “likelihood” is the probability (varies from 0 to 1) that the observed values of the dependent may be predicted from the observed values of the independents. The “log likelihood (LL)” is the log of the likelihood, and is the basis for tests of a logistic model (Garson, 2010).

The impact of the predictor variables (genSE and ohs_SE) will be explained in terms of odd ratios, and will be indicated by "Exp(*b*)" in the SPSS output. The odds ratio is the factor by which the independent variables increase or decrease the log odds of the dependent variable hlthOUT. The "log odds" of the dependent event refers to the natural log of the "odds" of the dependent event—the "odds" of an event hlthOUT is equal to the probability of the event occurring divided by the probability of the event *not* occurring (Garson, 2010).

Results

FSIC employed a number of measures, mentioned in the previous section, which had been created to conceptualize the three research questions. The first two questions regarded the types of health information involved and the reasons behind the online-health-search. The information obtained from these questions was used as background information for the final and most important research question: How does the online-health-search impact the personal health care choices of college women?

RQ1: Types of Online Health Information

This research question is directly answered via the survey question that asks the following: "Specifically, have you ever looked online for information about…?" Answer options of both general health issues and women's health issues were presented to the respondent. Please refer to Table 2 for a list of percentages according to health category.

Table 2

Topics of Online Health Search

Category	*N*[a]	*N*	%	rank
General Health				
A specific disease or medical problem	320	277	86.6	1
A certain medical treatment or procedure	315	231	73.3	4
Nutrition	318	246	77.4	3
Exercise	316	248	78.5	2
Prescription drugs	315	152	48.3	6
Over the counter drugs	313	124	39.6	7
Substance abuse (alcohol or drugs)	311	112	36	9
Mental health issues (i.e. depression)	312	174	55.8	5
Health insurance options for yourself	314	118	37.6	8
Women's health				
Oral contraceptives (birth control pills)	315	185	58.7	1
Emergency contraception (Plan B or "morning after" pill)	312	121	38.8	3
Condoms	309	55	17.8	6
Human papillomavirus (HPV) vaccine	310	103	33.2	4
Safe sexual practices	315	82	26.4	5
Sexually transmitted infections (STIs)	315	156	49.5	2

[a] *N* is the total number of respondents who answered that particular question.

Among the “general health” category, the top four issues searched for included “a specific disease or medical problem” (86.6 %), “exercise” (78.5 %), “nutrition” (77.4%), and “a certain medical treatment or procedure” (73.3%). The bottom four issues among general health issues included “mental health issues” (55.8 %), “prescription drugs” (48.3%), “over the counter drugs” (39.6%), and “health insurance options for yourself” (37.6 %).

The most searched for topic (58.7%) among the “women’s health” category was “oral contraceptives (birth control pills).” The two next most searched items were “sexually transmitted infections (STIs)” (49.5 %) and “emergency contraception (Plan B or “morning after pill”)” (38.8%). The bottom three women’s health items searched for included “Human papillomavirus (HPV) vaccine” (33.2%), “safe sexual practices” (26.4%), and “condoms” (17.8%).

RQ2: Reasons Behind Online Health Search

The results of this research question were taken from the open-ended responses to the following survey question: “Thinking about the last time you went online for health or medical information…Did you go online to look for information related to your own health or medical situation or someone else’s health or medical situation?” Of the total number of surveys (*N* = 321), only 266 listed additional information to clarify their response. The results of the coding process for who or whom the respondent was searching for information indicated that the breakdown was fairly evenly dispersed—35.34% of respondents did not list the individual the search was intended for or their answer qualified in the “other” category, 29.70% remarked that they had been searching for issues pertaining to their own health, 24.44% were looking for information about someone else's health, and 10.53% reported they looked for both their own health and someone else's.

The open-ended responses of the 266 respondents also indicated the reason or topic of the online-health-search. It was found that 35.34% were looking online for general health knowledge, immediately followed by topics of illness (10.53%) and women's health (9.77%). A complete list of results is presented in Table 3.

Table 3

Reasons for Online Health Search

Category	*n*	%
General health knowledge	94	35.34
Illness	28	10.53
Women's Sexual and Reproductive Health	26	9.77
Multiple Reasons	23	8.65
Chronic Illness	21	7.89
Nutrition/Diet/Exercise	20	7.52
Schoolwork Purposes	20	7.52
Other	13	4.89
Mental Health	10	3.76
Remaining	11	4.14
Total	266	100

RQ3: Outcomes

“Major”, “minor”, and “no” impacts. Respondents were instructed to mark in survey question 17 whether the online health search had a (1) “major impact,” (2) “minor impact,” or (3) “no impact” at all. The majority of respondents (*n* = 192, 60.4%) marked “minor impact,” while 23.3% (*n* = 74) listed “major impact,” and 16.4% (*n* = 52) listed “no impact”.

When the additional open-ended responses were analyzed, the category “increased general knowledge” was the number one category for both “major impact” (54.84% of responses) and “minor impact” (40.25 % of responses). The next highest category for “major impact” was “preventive medicine change” (19.35%) which included issues of change in nutrition, diet, exercise, and fitness.

Responses of “minor impact” were coded similarly to the categories for “major impact” (please see above paragraph). The top reason was “increased general knowledge,” as mentioned in the above paragraph. The second most commonly listed response (20.75%) in the “minor impact” analysis was “distrust of online health information.” This particular category, belonging only to the coding scheme of “minor impact” was unanticipated and was included only after the discovery of the high frequency of these responses. A full breakdown of percentages according to coding categories for “major impact” and “minor impact” responses are present in Table 4.

Table 4

Content Analysis of “Major” and “Minor” Impacts

Impact	*n*	%	rank
Major			
Increased general knowledge	34	54.84	1
Preventive medicine change	12	19.35	2
Medications change	5	8.06	3
Treatment(self-management) change	4	6.45	4
Health visit made	4	6.45	4
Remaining	3	4.83	5
Total	62	100	
Minor			
Increased general knowledge	64	40.25	1
Decreased effectiveness of information	33	20.75	2
Preventive medicine change	11	6.92	3
Health visit made	10	6.29	4
Other	10	6.29	4
Schoolwork Purposes	9	5.66	5
Illness knowledge	8	5.03	6
Multiple	5	3.14	7
Unspecified	4	2.52	8
Medications change	4	2.52	8
Chronic illlness knowledge	1	0.63	9
Total	159	100	

Follow-up health visit. One of the most common outcomes analyzed after an online health search is the arrangement of a follow-up health visit to supplement the information found. In response to (*N* = 321) "did you later talk with a doctor or other health care professional about the information you found online?", 64.2% (1) marked "no," 32.7% (2) of respondents marked "yes," and 3.1% (3) marked "unsure."

Of those who provided additional information as to why they did not see a health care professional after their search (*n* = 94), 26% decided that a follow-up health visit was unnecessary, while 23% were unable to make arrangements for such a visit and 20% stated the search query was strictly for informational purposes.

The content analysis of additional responses to "yes" (*n* = 104) revealed that the top category (37.23%) for making a follow-up visit was for "general health knowledge" purposes, followed immediately (17%) by visits regarding "women's sexual or reproductive health." For complete details, see Table 5.

Table 5

"Yes" and "No" Open-ended Responses to Follow-up Visit

Reason	*n*	%
"No"		
Unnecessary to ask	27	25.96
Unable to Ask	24	23.08
Search only informational	21	20.19
Unspecified Reason	10	9.62
Other	7	6.73
Search concerned someone else	6	5.77
Search conducted after health care visit	5	4.81
Problem resolved by itself	4	3.85
Total	104	100.00
"Yes"		
General health knowledge	35	37.23
Women's Sexual and Reproductive Health	16	17.02
Illness	10	10.64
Medications	9	9.57
Other	9	9.57
Multiple	5	5.32
Mental Health	4	4.26
Chronic Illness	3	3.19
Nutrition/Diet/Exercise	3	3.19
Total	94	100

Specific health behavioral outcomes. The final section of the questionnaire involved items designed to assess how the respondent behaved after the online health search. These items contained questions concerning specific behavioral choices the respondent might have chosen, such as scheduling a follow-up visit with a physician or deciding to be tested for STIs. The highest percentages of positive responses occurred in the categories “change the way you think about your diet” (*N* = 318, *n* = 199, 62.6%) and “lead you to ask a doctor/health professional new questions” (*N* = 318, *n* = 189, 59.4%). About a quarter of the respondents responded with “yes” for each women’s health category. For complete details, see Table 6.

Table 6

"Yes" Responses to Specific Health Behavioral Outcomes

Type of Outcome	*N*	*n*	%
General			
Affect your decision about how to treat a medical illness or condition	319	163	51.1
Change your overall approach to maintaining your health	319	168	52.7
Affect a decision about whether to see a doctor/health professional	319	169	53
Lead you to ask a doctor/health professional new questions	318	189	59.4
Change the way you think about your diet	318	199	62.6
Change the way you exercise	315	160	50.8
Women's health			
Impact a decision of yours to get tested for sexually transmitted infections (STI's)	316	82	25.9
Impact a decision of yours to get the HPV vaccine	315	74	23.5
Change the way you are sexually intimate with a partner	315	82	26

Note. N refers to the total number of respondents who answered that particular question.

Relationship between self-efficacy and "major" or "minor" outcomes. A multinomial regression was performed to analyze the relationship between the independent variables of general and online self-efficacy, and the dependent variable of major health outcome. Multinomial regression requires that the ratio of valid cases to number of independent variables be greater than 10 (Schwab, 2002), and in FSIC, the ratio was 317, much greater than the preferred ratio (see Table 7).

Table 7

"Case Processing Summary" Table Present in Multinomial Logistic Regression Analysis (SPSS)

hlthOUT (Dependent Variable)	Category	*N*	Marginal %
Did the health information you found online have a major impact on your own health care, a minor impact, or no impact at all?	Major impact	74	23.30
	Minor impact	192	60.40
	No impact	51	16.1
Valid		317[a]	100.0
Missing		4	
Total		321	
Subpopulation		60[b]	

[a] The ratio of valid cases to number of independent variables (1) is 318 to 1.
[b] The dependent variable has only one value observed in 18 (30.0%) subpopulations.

Next, the significance test for multinomial logistic regression (called the "likelihood ratio test" or the "model chi-square" test) was performed. This is a test of the overall significance of the model and is shown in the "final" row of Table 8.

Table 8

Significance Test of the Multinomial Logistic Regression Model

	Model Fitting Criteria			Likelihood Ratio Tests		
Model	AIC	BIC	-2 Log Likelihood	Chi-Square	df	*p*
Intercept Only	2.83E2	2.90E2	2.79E2			
Final	2.67E2	2.55E2	2.55E2	23.24	4	.001*

Note. The "intercept only" model is the null model. The "final" model is the fitted model with predictor variable ohs_SE. The "-2 log likelihood (2LL)" statistic is the likelihood ratio, and is also called goodness of fit or deviance chi-square. The difference in the 2LL measures how much the final model improves over the null model.
*p< 0.001, indicating that the final model is a good fit.

The value of the final-model chi-square (23.24) was indicated by a probability of less than .001, which indicated the presence of a relationship between the independent variables of self-efficacy and the dependent variable of health outcome. The null hypothesis that there was no difference between the model without independent variables and the model with independent variables was rejected.

Next, the significance test of the model according to each independent variable, general self-efficacy and online health search efficacy, was assessed. It was found that the model for the variable genSE ("general self-efficacy") was not significant ($p = 0.727$), but the model for the variable ohs_SE ("online-health-search self-efficacy") was very significant ($p < .001$). Therefore the information corresponding to general self-efficacy was disregarded.

The final results of the multinomial logistic regression indicated a significant relationship between online self-efficacy and the indication of “major impact.” The value of Exp(*b*) for online self-efficacy, an odds ratio, was 2.222 (see Table 9), which implied that for each one unit increase in online self-efficacy, the odds that the respondent indicated the online health search had a major impact on their health increased by a factor of 2.22, or 122.22 % (2.22-1.0 = 1.22).

Table 9

“Parameter Estimates,” or “Logistic Regression Coefficients” for ohs_SE and hlthOUT Multinomial Logistic Regression Model

Parameter	*b*	*SE*	Wald	*df*	*p*	Exp (*b*)	Ex(*b*) 95% Cl
			“Major Impact”				
Intercept	-4.99	1.24	16.14	1	.001		
ohs_SE	0.80	0.20	15.36	1	.001	2.22	[1.49, 3.31]
			“No Impact”				
Intercept	-1.03	1.24	0.69	1	.407		
ohs_SE	-.14	0.20	.48	1	.488	.87	[0.59, 1.29]

Note. The reference category is “minor impact.” The values of “Exp (*b)*” signify the odds ratios for the independent variable, in this case ohs_SE. The *b* terms are the logistic regression coefficients, or the parameter estimates, for the logistic regression model.

The value of the “Wald” statistic shown in Table 9 indicated that the model was statistically significant ($p < .001$) and the null hypothess was rejected (Garson, 2010). The table also shows that the standard error of the independent variable ohs_SE was less than 2 (0.20 and 0.20, respectively), indicating that numerical problems such as multicollinearity did not exist (Schwab, 2002).

Discussion

Significance of Findings

The Internet has become a dynamic and extensive source of health information for college women. Yet the analysis of this behavior must extend not only to the search itself but the consequences of the search on the individual's personal health care choices. The present study examined the processes of the search and its potential for change in health care behavior among female college students.

Research question one: Types of online health information. FSIC's results for this question were in agreement with the results of the 2006 Pew Internet Project (Fox, 2006). In FSIC and the Pew study, the most searched for general health topic among women was a "specific disease or medical problem." Therefore college women, similar to e-patients in general, mainly conduct their online health searches with a specific health issue in mind.

The topics of nutrition, diet, and exercise proved to be especially important to women in FSIC, as it has been shown in the Pew study. In the Pew study, the top third and fourth topics searched for, respectively, were "diet, nutrition, vitamins" and "exercise or fitness." These results correspond with this FSIC's findings; the second and third most commonly searched topics were "exercise" and "nutrition," respectively. Prior studies have also shown that these topics of preventive health were commonly searched for among college students (Escoffery et al., 2005; Baxter, Egbert, & Ho, 2008).

What made FSIC unique was its survey of respondents' searches concerning women's health issues. A comprehensive look at these issues that are highly significant in female college students' lives has never been taken before, thus making the following results highly important. It was found that the number one topic (among women's health topics presented for choosing) was "oral contraceptives." This shows that the issue of birth control pills is of great interest to college women. Another reproductive health topic that was searched for was "emergency contraception."

College women have been shown in FSIC to be interested in matters of sexual health as well; about half of the respondents looked for health information about "sexually transmitted infections," and one-third reported looking for information about the "HPV vaccine."

These findings can be used to justify a greater focus on issues of birth control, STIs, and the HPV vaccine on Internet women's health websites.

Research question two: Reasons for looking online. FSIC asked respondents, just as the 2006 Pew study did, for whom they were searching online. FSIC results showed that the percentages of respondents who looked on behalf of themselves, for others, or for both themselves and others were evenly spread, unlike one-half of respondents in the Pew study who looked online for health information for others.

FSIC went beyond this question by asking respondents for additional information. It was found that the number one reason for looking online was for "general health purposes," followed by the presence of an "illness," and then for reasons pertaining to "women's health."

Research question three: Health outcomes of the online health search. This research question was the most important part of the study because the focus of FSIC was to explore the issue of health outcomes resulting from online health searches. One way to measure a health outcome, as done in the Pew study (Fox, 2009), is to determine whether the individual speaks to a health professional about the information he or she might have found online. The results of FSIC show that a minority of respondents speak to a health professional about online health searches, which agrees with prior studies of college students as well (Escoffery et al., 2005).

FSIC and the 2006 Pew study agreed on the percentages of specific health behavioral outcomes after the online health search, such as "affected a decision about how to treat an illness or medical condition. Yet FSIC is unique because it asked the respondent to detail specific behavioral health outcomes concerning women's health. About a quarter of respondents made a personal health decision regarding each of the following sexual health categories: (1) testing for STIs, (2) the HPV vaccine, and (3) sexual intimacy with a partner. The online health search thus makes an impact in specific ways on the sexual health-care decisions of college women. The existing literature does not address health impacts having to do with sexual health-care decisions, and so FSIC provides an important introductory survey of these issues.

The most important finding of FSIC is contained in the results of the multinomial logistic regression that examined the relationship between the participant's self-efficacy and her report of a "major impact" on her health after the online health search. FSIC was based on Bandura's concept of self-efficacy with regards to health promotion (1998), which states that the higher the self-efficacy of an individual, the more likely the individual will reach his or her personal goals. FSIC agreed with this concept, not in matters of general self-efficacy, but in matters of health-promoting behavior, most specifically an individual's sense of efficacy in searching for online health information (ohs_SE). It was found that as the respondent's level of ohs_SE increased by one unit, the odds that they would report a "major" impact on their health (after the online-health-search) increased by a factor of 2.22, or 122.22%. This result agrees with results of prior studies that have shown that increases in self-efficacy can influence the motivations behind the online-health-search (Bandura, 2004; Bass et al., 2006; Lee, Hwang, Hawkins, & Pingree, 2008). FSIC, however, went beyond these results by defining self-efficacy with regards to the online-health-search itself, and then relating that to the self-reported level of health outcome of the respondent. Such a comparison between such a specific type of self-efficacy (ohs_SE) and level of health outcome has never been made. Additionally, this comparison was made among college women, a population that has not been studied in-depth before. The results of FSIC will fill a significant gap in the literature that exists by offering introductory information about this particular population.

Limitations

One limitation that existed in this study was that one-third of all survey respondents marked the Health Science/Nursing option as their major or program of study. These students may possess a higher level of self-efficacy regarding health matters because of their unique learning experience in the health field, and they may search for health information on the Internet at a higher rate than the average female student because of the subject matter of their classes or the nature of their classroom assignments.

Another limitation to the study existed in the number of respondents recruited at the Student Health Center, a location with a possible greater number of students who may have a higher-than-average level of self-efficacy with regards to their own personal health care.

Future Applications

In 1975, before the age of the modern-day Internet, doctors recognized that "the mass media represent an enormous and unprecedented potential for public health education" (Barnum, p. 24). This potential has become even greater with the arrival of the Internet. FCIS conducted an introductory survey of the online-health-search habits of college women, and the possible health outcomes the search might incur. This introductory, yet expansive, survey can have major implications in the design for online public health campaigns that are geared towards college women. This can include changes in the type and content of information offered to college women on university student health websites or networks. The FSIC results can even affect the processes of the student health care system—knowledge of outcomes and reasons of the online health search can change the system's approach in educating college women about their health. FCIS only involved college women, but future studies can address online-health-searching among college men. This can affect the entire approach of the student health care system and not only its approach to the health care of female students.

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Appendix A

Questionnaire: Health Information Version 2.0: Female Students in Cyberspace

Dear Respondent,

Thank you so much for your time. The following survey below may take around 10 minutes to complete. Your careful attention to the instructions will be much appreciated. There are 5 sections to this survey

Sincerely, Sonia Easaw, M.S. Mass Communications Student

Section I: Please tell me about your access to the Internet.

Please mark your answer in the space provided with a check mark.

Question 1: Do you use the Internet, at least occasionally? Please mark one.

_____ Yes
_____ No
_____ Not sure
_____ Other, please specify: ______________________________

____

Question 2: *WHERE* do you access the Internet the most? Please mark one.

_____ HOME on a personal computer
_____SCHOOL on a SJSU or SJSU/MLK library computer
_____WORK on a work-owned computer
_____LIBRARY on a public library (not MLK library) computer
_____OTHER, please specify: ___________________________

____

Question 3: About *HOW LONG* do you use the Internet in a typical day? Please mark one.

_____ 0 to 0.5 hours per day
_____ 1 to 2 hours per day
_____ 2.5 to 3.5 hours per day
_____ 4 to 5 hours per day
_____ Greater than 6 hours per day
_____ Other, please specify:
____

Section II: Please tell me about your online health search.

Please mark your answer in the space provided with a check mark.

Question 4: *Changing topics*...In general, how would you rate your own health? Please mark one.

_____ Excellent
_____ Good
_____ Only fair
_____ Poor
_____ Other, please specify:
____

Question 5: In the last 12 months, have you seen a physician or other health care professional for a medical visit, either for regular health care check-ups or for medical emergencies? Please mark one:

_____ Yes; please elaborate______________________________

____

_____ No; please elaborate______________________________

____

_____ Unsure; please elaborate___________________________

Question 6: Now, I would like to ask if you've looked for information **ONLINE** about certain health or medical issues. **Specifically, have you ever looked online for information about...?** Please mark once among yes, no, or unsure for **EACH** item in the list.

	YES	NO	UNSURE
a specific disease or medical problem			
a certain medical treatment or procedure			
nutrition			
exercise			
prescription drugs			
over the counter drugs			
substance abuse (alcohol or drugs)			
mental health issues (i.e. depression)			
oral contraceptives (birth control pills)			
emergency contraception (Plan B or "morning after" pill)			
condoms			
Human papillomavirus (HPV) vaccine			
safe sexual practices			
sexually transmitted infections (STIs)			
health insurance options for yourself			

Question 7: Thinking about the **LAST** time you went online for health or medical information… Did you go online to look for information related to **YOUR OWN** health or medical situation or **SOMEONE ELSE'S** health or medical situation? Please mark one.

_____ Yes; please elaborate________________________________

____

_____ No; please elaborate________________________________

____

_____ Unsure; please elaborate_____________________________

____

Question 8: Thinking about the **LAST** time you went online for health or medical information...did you later talk with a doctor or other health care professional about the information you found online? Please mark one.

_____ Yes; please elaborate________________________________

____

_____ No; please elaborate________________________________

____

_____ Unsure; please elaborate_____________________________

____

Section III: Please tell me a little bit about your own feelings of self-efficacy

The following statements involve your feelings about **your own** abilities. Please indicate how much you agree with each statement (where **1 = Strongly Disagree and 5 = Strongly Agree**) by circling the number corresponding to your answer.

Question 9: I can always manage to solve difficult problems if I try hard enough.

Strongly Disagree **1** **2** **3** **4** **5** Strongly Agree

Question 10: If someone opposes me, I can find the means and ways to get what I want.

Strongly Disagree **1** **2** **3** **4** **5** Strongly Agree

Question 11: I am confident that I can deal efficiently with unexpected events.

Strongly Disagree **1** **2** **3** **4** **5** Strongly Agree

Question 12: I can solve most problems if I invest the necessary effort.

Strongly Disagree **1** **2** **3** **4** **5** Strongly Agree

Question 13: When I am confronted with a problem, I can usually find several solutions.

Strongly Disagree **1** **2** **3** **4** **5** Strongly Agree

Question 14: I am confident that I have the power to affect my own health through my behavior, whether good or bad.

Strongly Disagree **1** **2** **3** **4** **5** Strongly Agree

Question 15: I am confident in my Internet searching skills when it comes to looking for health information online.

Strongly Disagree **1** **2** **3** **4** **5** Strongly Agree

Question 16: Looking for health information online will help me achieve my personal health goals**.**

Strongly Disagree **1** **2** **3** **4** **5** Strongly Agree

Section IV: Please tell me about the outcomes of your online health info search

Question 17: Did the health information you found online have a **major** impact on your own health care, a **minor** impact, or **no impact** at all? Please mark one.

_____ **Major** impact; please elaborate______________________________

____

_____ **Minor** impact; please elaborate______________________________

____

_____ **No impact**; please elaborate______________________________

____

Question 18: In which of the following ways, if any, did the health information you found **ONLINE** affect **your own** health care routine? **Did the information you found online…?** Please mark once among **yes, no, or unsure** for **EACH** item in the list.

	YES	NO	UNSURE

	YES	NO	UNSURE
Affect your decision about how to treat a medical illness or condition			
Change your overall approach to maintaining your health			
Affect a decision about whether to see a doctor/health professional			
Lead you to ask a doctor/health professional new questions			
Change the way you think about your diet			
Impact a decision of yours to get tested for sexually transmitted infections (STI's)			
Impact a decision of yours to get the HPV vaccine			
Change the way you are sexually intimate with a partner			
Change the way you exercise			

Section V: Please tell me a little about yourself.

Question 19: What is your age in years? _____ years

Question 20: What is your gender? ____ Female ____ Male
____ Other, please elaborate _________
____

Question 21: What is your ethnicity?
_____American Indian or Alaskan Native _____Asian or Pacific Islander
_____African-American _____Hispanic/Latino
_____White _____Other/Unknown _____Multi-racial

Question 22: What type of student degree program are you currently enrolled in at SJSU?
____ Undergraduate ____ Graduate ____ Open University ____ Other, please elaborate
____

Question 23: What category does your major/program of study fall into?
_____Humanities _____Computer Science
_____Health Sciences/Nursing _____Engineering

_____Physical/Biological Sciences _____Business _____Other, please elaborate_____

____

Question 24: What is your relationship status?
_____ Single, not in a relationship _____ Single, dating casually
_____ Single, dating one person exclusively _____ Living with my partner
_____ Married/Committed _____ Divorced _____ Other, please elaborate:

____

Question 25: How would you describe your living situation?
_____ Life on-campus in SJSU campus housing _____ Live off-campus with roommates
_____ Live off-campus with parents/relatives/.family ____ Other, please specify__________

____

Thank you so much for completing this survey. Please deposit your survey in the designated box. Please remember to retain the "disclosure form" for your records. Have a great day!

Appendix B

Survey Disclosure Form

Responsible Investigator(s): Sonia Easaw and Dr. Priya Raman

Dear Respondent,
1. You have been asked to complete a survey questionnaire for the purpose of the master's thesis research of Sonia Easaw, a M.S. student at San Jose State University (SJSU) at the School of Journalism and Mass Communications. Your completion of the survey indicates your willingness to participate. Please keep this information for your records and do not write any information on the survey that could identify you. Easaw's primary thesis advisor is Dr. Priya Raman, of the Communications Studies Department at SJSU. This survey will be used for the research topic of female college students looking for health information online.

2. You will be asked to anonymously and privately complete the included printed survey during the month of February, upon the survey's receipt of approval from the SJSU Human Subjects International Review Board (HS IRB). You may complete the survey in a privately cornered and designated space for survey taking, and you will only be asked to complete the survey during school hours.

3. No foreseeable risks are associated with taking this survey. Instead, you indirectly may benefit by contributing to a much needed knowledge base of improving women's health care or by becoming more aware of your own Internet health information-searching habits.

4. **This study is NOT being conducted by the Student Health Center, but permission to gather data in the Student Health Center foyer and outside of the Student Health Center** has been graciously granted to researcher Sonia Easaw.

5. Although the results of this study may be published, no information that could identify you will be included.

6. There will be no compensation for participation in this survey. However, participants may be offered refreshments and/or a chance to enter a raffle, but they are under no obligation to do so.

7. **Questions about this research** may be addressed by phone to Sonia Easaw, at (408) 656-3806, or via e-mail at sonia_easaw@yahoo.com, or to Dr. Priya Raman via email: praman.sjsu@gmail.com or phone at 408-924-5371

Complaints about the research may be presented to Dr. William Tillinghast, Department

Chair, M.S. Mass Communications Program, at (408) 924- 3239 or William.Tillinghast@sjsu.edu

Questions about a research subjects' rights, or research-related injury may be presented to Pamela
Stacks, Ph.D., Associate Vice President, Graduate Studies and Research, at (408) 924-2427.

8. **No service of any kind, to which you are otherwise entitled, will be lost or jeopardized if you choose not to participate in the study.**

9. **Your consent is being given voluntarily. You may refuse to participate in the entire study or in any part of the study.** You have the right to not answer questions you do not wish to answer. If you decide to participate in the study, you are free to withdraw at any time without any negative effect on your relations with San Jose State University or with the San Jose State University Student Health Center.

10. **After you are finished with the survey, please deposit it into the designated box that has been designed to accommodate the anonymous return of your survey.**

Sincerely,
Sonia Easaw, M.S. Mass Communications Student

Appendix C

Coding Instructions

Table C1

Survey Question Five: "Yes" Responses to Health Care Visit Made In Last Year

Category title	*Coding instructions*
Injury	All ambulatory (out-patient) care, fracture, sprain, minor burns, cuts, bruises
Immunization	Shots, flu, travel, vaccines
General check-up	Follow-up, annual physical, sports physical, general-information-seeking
Illness	Cold, cough, flu, measles, stomach-stuff, short-term medical conditions, flu and needed medication, medical problems
Preventive medicine	Nutrition, diet, exercise
Women's sexual and reproductive Health	Birth control, Pap smear, pregnancy, PCOS, UTIs, STD testing, STDs
Chronic illness	Long-standing illnesses such as diabetes, high blood pressure, cancer, eating disorders, allergies, frequent headaches and migraines
Mental health	Depression, anxiety, psychiatry
Laboratory	Blood work, X-rays, preventive procedures such as colonoscopy or endoscopy
Surgery	Local and general anesthesia
Pharmacy	Medications, prescriptions
Physical therapy	Sports medicine, chiropractors, recovery rehabilitation
Emergency	Same
Dental	Teeth
Optometry or Ophthalmology	Eyes
Other	Anything that does not fit in the above categories; includes dermatology
Multiple	More than one category

Appendix D

Coding Instructions for Survey Question 17: Responses of “Major” and “Minor” Impact

Table D1

Coding Instructions for Open Ended Responses of “Major Impact”

Category	Coding Instructions
Knowledge increase: General	Increased awareness of health issues, became more "health conscious", changed health behavior in general (unspecified), empowerment (generally in terms of health), help to calm anxieties
Preventive medicine change	Changed diet, nutrition, weight, fitness, exercise
Health visit made	Led to doctor's visit and possible treatment change/diagnosis; more informed before going to the doc
Treatment change	Led to minor change in self-management of treatment of condition; (not including medication/pharmacy)
Drug regimen change	Led to changes in prescription or over-the-counter drugs
Laboratory work done	Same
Knowledge increase: Illness	Found more info regarding an illness or medical condition (temporary)
Knowledge increase: Chronic illness	Knowledge--found more info on chronic disease
Knowledge increase: Surgery	Same
Injury	Unnecessary
Other	Unnecessary

Table D2

Coding Instructions for "Minor Impact" Responses

Category	Coding Instructions
Knowledge increase: General	Basic information, including basic change in behavior
Decreased effectiveness of information	Information may be good start, but not credible/reliable enough to be trusted completely; incl doc should verify info; including "prefer talking to doc"
School work purposes	Schoolwork purposes--nursing students, health majors, often don't need info online--or don't use the Internet as much as their textbooks
Drug regimen change	Medications change, information on prescription drugs, over-the counter drugs, side effects, pharmacy
Health visit made	Led to doctor visit, verified doc info, led to ?'s asked of health professionals, led to choice of whether or not to see a doctor
Preventive medicine change	Exercise, fitness, diet, nutrition
Knowledge increase: Illness	About illness (minor or temporary), self-diagnoses with symptoms, treatment of illness,
Knowledge increase: Chronic Illness	Chronic illlness knowledge incl allergies and allergic reactions
Unspecified	Minor impact, unspecified
Multiple reasons	Same
Other	Same

Appendix E

Coding Instructions for Follow-up Visit Made After Online Health Search

Table E1

Coding Instructions for "Yes" Responses

Category	Coding Instructions
General information	Unspecified information, questions about search, questions about unspecified symptoms
Women's health	Sexual/reproductive health including birth control, pap smear, STIs, UTIs, hormone levels, yeast infections
Illness	Questions about particular illness, symptoms of an illness (temporary)
Chronic illness	Questions about a chronic illness i.e. diabetes.
Preventive medicine	Questions about preventive medicine including diet, weight, fitness, nutrition
Treatment	Questions about medications/drugs/treatment
Other	Same
Multiple reasons	Same
Mental health	Same

Table E2

Coding Instructions for "No" Responses

Category	Coding instructions
Unnecessary to ask	Patient felt there was no need to see doctor, because info found online was sufficient and did not need follow-up, or just unnecessary in general. Also, did not even look online in the first place. Also, if didn't find anything online to ask about.
Unable to Ask	Because of financial reasons, no insurance, doctor unavailable, no time, too busy, too lazy, embarrassed, personal reasons, didn't think of asking, forgot. upcoming appointment
Search only informational	General information-searching about health-related issues without a specific cause in mind except overall health and wellness

Unspecified Reason	Same
Other	Same
Search concerned someone else	Information was found for someone else
Search conducted after health care visit	searched for online info to confirm a doc's findings/diagnosis OR in conjunction with information was found for someone else
Problem resolved by itself	Problem resolved itself somehow and went away, including resolving problem/question via another source