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# The Importance of eHealth in the Education of Underserved Populations

Shanel L. Winfield

*University of Northern Iowa*

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## Abstract

The use of the Internet or the World Wide Web for educational purposes is widespread and rapidly growing. It is only natural that, in response to this rapid growth, its usage expands into the field of medicine, particularly eHealth. But as the nature of how the Internet is being used in health and medicine increases, there is a large segment of the population being left behind because of lack of access. This lack of access is in response to economic barriers, political barriers, social-cultural barriers and social-economic barriers. Issues of literacy, content, and language also play a role in the continuance of what is known as the digital divide and its role in the education of underserved populations on health-related issues. The purpose of this literature review is to examine the role of technology in the in the education of underserved populations on health care related issues, and to measure the effectiveness of the Internet as a mechanism for obtaining health information for underserved populations.

# The Importance of eHealth in the Education of Underserved Populations

A Graduate Review

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Division of Performance and Training Technology

Department of Curriculum and Instruction

In Partial Fulfillment

Of the Requirements for the Degree

Master of Arts

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By

Shanel L. Winfield

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1/11/06
Date Approved

Leigh E. Zeitz
Graduate Faculty Reader

1-11-06
Date Approved

J. Ana Donaldson
Graduate Faculty Reader

1-11-06
Date Approved

Greg P. Stefanich
Head, Department of Curriculum and Instruction

# Abstract

The use of the Internet or the World Wide Web for educational purposes is widespread and rapidly growing. It is only natural that, in response to this rapid growth, its usage expands into the field of medicine, particularly eHealth. But as the nature of how the Internet is being used in health and medicine increases, there is a large segment of the population being left behind because of lack of access. This lack of access is in response to economic barriers, political barriers, social-cultural barriers and social-economic barriers. Issues of literacy, content, and language also play a role in the continuance of what is known as the digital divide and its role in the education of underserved populations on health-related issues. The purpose of this literature review is to examine the role of technology in the in the education of underserved populations on health care related issues, and to measure the effectiveness of the Internet as a mechanism for obtaining health information for underserved populations.

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liquors, it appeared to me more like a joke than a serious engagement, and I did not at once perceive why these temperate citizens could not content themselves with drinking water by their own firesides. I at last understood that these hundred thousand Americans, alarmed by the progress of drunkenness around them, had made up their minds to patronize temperance. They acted in just the same way as a man of high rank who should dress very plainly in order to inspire the humbler orders with a contempt of luxury. It is probable that if these hundred thousand men had lived in France, each of them would singly have memorialized the government to watch the public houses all over the kingdom. Nothing, in my opinion, is more deserving of our attention than the intellectual and moral associations of America. The political and industrial associations of that country strike us forcibly; but the others elude our observation, or if we discover them, we understand them imperfectly because we have hardly ever seen anything of the kind. It must be acknowledged, however, that they are as necessary to the American people as the former, and perhaps more so. In democratic countries the science of association is the mother of science; the progress of all the rest depends upon the progress it has made.

Among the laws that rule human societies there is one which seems to be more precise and clear than all others. If men are to remain civilized or to become so, the art of associating together must grow and improve in the same ratio in which the equality of conditions is increased.

**Reference:**

de Tocqueville, Alexis. 1873. *Democracy in America.* Translated by Henry Reeve; edited, with notes, the translation, revised and in great part rewritten, and the additions made to the recent Paris editions, now first translated, by Francis Bowen. Boston: John Allyn, chapter 5.

## The Constitution of the Brook Farm Association (1841)

*This constitution is from one of the most famous of the utopian experiments, those attempts to form the perfect social organization, preceding the Civil War.*

In order more effectually to promote the great purposes of human culture; to establish the external relations of life on a basis of wisdom and purity; to apply the principles of justice and love to our social organization in accordance with the laws of Divine Providence; to substitute a system of brotherly cooperation for one of selfish competition; to secure to our children and those who may be entrusted to our care, the benefits of the highest physical, intellectual and moral education, which in the progress of knowledge the resources at our command will permit; to institute an attractive, efficient, and productive system of industry, to prevent the exercise of worldly anxiety, by the competent supply of our necessary wants; to diminish the desire of excessive accumulation, by making the acquisition of individual property subservient to upright and disinterested uses; to guarantee to each other forever the means of physical support, and of spiritual progress; and thus to impart a greater freedom, simplicity, truthfulness, refinement, and moral dignity, to our mode of life; —we the undersigned do unite in a voluntary Association, and adopt and ordain the following articles of agreement, to wit:

# INTRODUCTION

## *The Importance of Educating Underserved Populations on Health Issues*

Recent studies have shown that many health disparities are related to a variety of lifestyle factors. These lifestyle factors, combined with certain social, economic, educational and cultural factors have led to a national breakdown in our health care system. One concern is the difference in life expectancy and healthfulness between those who are educated about health issues and those who are not educated about health issues. There are differences between these groups, and the numbers speak volumes. How can the Internet provide access to health information to change all of this?

According to Nicholson, Grayson & Powe (2003) "health information resources, which include print media, broadcast media, computer-based resources and health organizations, are the primary communications methods used by health care providers and policy makers to disseminate health care information to consumers and to guide health behaviors" (p. 580). However, in a survey completed by Murray, Lo, Pollack, Donelan, Catania, White, et al. (2003), it was found that "younger, wealthier, better educated people were more likely to have looked for information, with education being the most important factor" (p. 1730). Additionally, this study indicates that "African Americans were less likely than whites to look for information" (Murray et al., 2003, p. 1730). This gap may be the result of limited access to the information. According to Parent (2001) "differences in income and educational levels are the leading factors contributing to the [digital] divide in the United States" (p. 2).

### *Healthfulness*

The Health of Minority Women (2002) estimates that:

> Of the 143.4 million females, 42.1 million females (or 29.3%) are members of racial and ethnic minority groups. Although these women experience many of the same health problems as White women, as a group, they are in poorer health, they use fewer health services, and they continue to suffer disproportionately from premature death, disease, and disabilities. Many also face tremendous social, economic, cultural, and other barriers to achieving optimal health." (p. 1)

Altman (2004) states "over one-quarter of women living at or near poverty level were reported to be in fair or poor health (26.4 percent). That is twice the level for women in families with middle-level incomes (12.3 percent) and three times the proportion for women with high family incomes (8.4 percent)" (p. 3).

Recent findings have shown that there is a relationship between socioeconomic status and obesity. "Women and persons of low socioeconomic status within minority populations appear to particularly be affected by overweight and obesity" (Obesity in Minority Women, 2005, p. 1 ). The American Obesity Association (2005) estimates that "women of the black (non-Hispanic) population have the highest prevalence of overweight (78 percent) and obesity (50.8 percent)" (p. 1). Additionally, they estimate that the Hispanic population has the highest number of overweight men with 74.4 percent being overweight and 29.4 percent being obese (American Obesity Association, Obesity in Minority Women, 2005, p. 1)

Many other obesity-related diseases including diabetes, hypertension, cancer, and heart disease are found in higher rates among various members of minorities groups compared with whites. For example, the differences in having high blood pressure versus normal blood pressure can be seen between different cultures. According to a study conducted in Detroit, 26 percent of Hispanics were hypertensive, (Artesian et al, 2004). Additionally, Black Women's Health found that "the prevalence of hypertension in African American is among the highest in the world" and an "80% higher death rate associated with strokes due to hypertension, a 50% higher death rate associated with heart disease due to hypertension, and a 30% higher death rate associated with end-stage kidney disease" (High Blood Pressure, (Hypertension) Enemy #1 in the African American Community, 2004, p.1). A study conducted by Roux, Chambless, Merkin, Arnett, Eigenbrodt, Nieto, Szklo, and Sorlie (2002) indicated that "Among blacks, being in the lowest individual-level socioeconomic category was associated with a 21% to 46% increased risk [of hypertension]" (p. 1). The study also indicated that "Whites in the lowest socioeconomic categories had a 23% to 35% higher risk of hypertension" (Roux et al, 2002, p. 1).

With respect to AIDS/HIV, in December 2001, the Center for Disease Control (CDC) (2005) reported that "more than 360,000 people are reported to be living with AIDS" and that "In all, since the disease was first reported 20 years ago, over 800,000 people have developed AIDS in the U.S" (p. 1). The disease is also disproportionately affecting women of color. According to the CDC "African American and Hispanic women together represent less than one-quarter of all U.S. women, yet they account for more than three-quarters of AIDS cases among women" (2005, p. 1). Additionally, the CDC found that "the rate of reported AIDS cases among African American was 8 times the rate for whites" (p. 1). They report that "almost two-thirds of all women reported with AIDS were African American" (p. 1).

### *Life Expectance/Mortality*

Recent findings indicate that there is a connection between high mortality rates among minorities and socioeconomic status. According to Correa, Chesley, and Bagley (2002) "Minority women continue to fare worse than white women in terms of health status, rates of disability, and mortality. Disparities are growing for some conditions" (p. 1). According to the U.S. Department of Health and Human Services, The Health of Minority Women:

> Poverty rates coupled with barriers to health education, preventative services, and medical care can result in disparities between white and minority women in several areas including: the likelihood of premature death, life expectancy, the risk factors for developing major diseases, and the extent and severity of illnesses (morbidity). (2002, p.6)

With respect to HIV/AIDS, the disease "ranks among the top three causes of death for African American men aged 25-54 years and among the top four cause of death for African American women aged 20-54 years. It was the number one cause of death for African American women aged 25-34 years" (Center for Disease Control, HIV/AIDS among African Americans, 2005, p.1).

Cancer kills a disproportionate number of minorities as well. According to the Christopher, Malone, and Daling (2003) "African Americans, Americans Indians, Hawaiians, Indians and Pakistanis, Mexicans, South and Central Americans, and Puerto Ricans were 1.4 times to 3.6 times more likely to present with advanced (stage IV) breast cancer than non-Hispanic whites" (p. 1). Studies indicate that, while more White women are being diagnosed with breast cancer, more African American women are dying of the disease. Chlebowski, Chen, Anderson, Rohan, Aragoki, Lane, Dolan, Paskett, McTiernan, Hubbell, Adams-Campbell, and Prentice (2005) report that "incidence rates for women of racial/ethnic minority groups are substantially lower than those for white women, with 141 cases per 100,000 in Whites, 122 in African Americans, 97 in Asian/Pacific Islander, 90 in Hispanics, and 58 in American Indians/Alaskan Natives" (p. 439). Yet, "African American women also have a higher breast cancer mortality rate than white women" (Chlebowski et al, 2005, p. 439).

### *Economic Cost*

The financial cost of providing rehabilitation in the form of treatment, education, medication, and prevention programs for these illnesses that affect the minority populations, have been astounding. Nationally, it is estimated that, in 2003, the United States government spent "15.3 percent of its Gross Domestic Product (GDP) on health care" and that "health care spending in the United States reached $1.7 trillion " (National Coalition of Health Care, 2004, p.1). It is also predicted that this number will increase to 18.7 percent in the next ten years (National Coalition of Health Care, 2004, p. 1).

States are being greatly affected as well. In 2000, the state of Minnesota estimated that it spent $495 million dollars "treating diseases and conditions that would be avoided if all Minnesotans were physically active" (Minnesota Department of Health Sheet, Children and Adolescent Physical Activity, 2004, p. 1). The state of Louisiana declared similar findings. According to the Louisiana Adult Obesity Fact Sheet (2004)

"Louisiana's estimated obesity-attributable annual medical expenditures are approximately $1.4 billion" (p.1).

Preventable illnesses that result in the development of diabetes are also expensive. The Health Care and Utilization Project Economic and Health Cost of Diabetes: HCUP Highlight 1 (2005) stated that "Diabetes with complications accounted for 1.2 percent of all inpatient hospital stays in 2001, resulting in national aggregate hospital costs of approximately $3.8 billion" (p.1).

The economic cost associated with hypertension is staggering. According to the American Heart Association (2004), the national direct and indirect cost of a stroke is over $53 billion dollars annually (p. 1). It is estimated that of the 50 million Americans who suffer from high blood pressure, 20 percent of the population has this risk factor for heart attack and stroke. The research findings reported in Stress and Cardiovascular Disease, Health Care Cost Implications (2004) indicated that the "cost of cardiovascular disease is estimated to be more than $188 billion, including the cost of physician and nursing services, hospital and nursing home services, medications, and lost of productivity resulting from disability" (p.1).

According to the Department of Health and Human Services, Cost Containment of Medicaid HIV/AIDS Drug Expenditures (2001) "it is probable that Medicaid's net spending on prescription drugs totaled $16.4 billion dollars in fiscal year 2000" (p. 2). They also estimated that 55% of all adults and 90% of children living with this disease are participating in some type of Medicaid program" (Department of Health and Human Services, Cost Containment of Medicaid HIV/AIDS Drug Expenditures, 2001, p. 1).

The question remains: how can the use of the Internet by an underserved person living with these illness help with all of these concerns? According to Gustafson, Hawkins, Boberg, Pingree, Serlin, Graziano, and Chan (1999) “The future for such intervention appears bright, with advantages such as cost-effectiveness, convenience and `mass media' ability to reach many persons with relevant, tailored information” (p. 8).

### *The Internet as a Communication Tool*

The environment used to communicate and research information regarding health-related issues has changed considerably in recent years. With the development of the Internet and the use of the World Wide Web, access to health-related information is ever increasing. Although this information is technically available, access to that information still may be impossible for some people.

As a communication tool, the Internet has transformed the way in which we live and has influenced all forms of decision making in our everyday interactions. According to Ratzan (2001), when we talk about new communication, we are often referring to the Internet or anything that is associated with a computer. As access to the Internet increases the amount of information that is readily available to the consumer, technology’s role in the health care arena also increases. The American Telecommunication Association reports that:

> Health professionals are increasingly being drawn into evaluating the Internet as a source of consumer information for health and medicine. Practitioners report that a growing number of patients arrive at their offices either with questions related to appropriate websites to visit or a large variety of health-related

> content gathered from the Internet. Some of this content may prove extremely helpful to the health and recovery of the patient. (2005, p. 1)

But what of those individuals who do not have access to this information?

### *Accessibility*

As more health information is available to the online user, those members of the underserved populations will need to have equitable access to online services in order to close the gap between those who have access to technology and those who do not have access to technology. According to Healthy People 2010 "...people with the greatest health burdens have the least access to information, communication technologies, health care, and supporting social services" (p. 7). Additionally, Bauer (2003) argues that "the digital divide is relevant to questions about distributive justice and e-health because persons who lack access to information technology or the skills needed to operate the same technology may also have greater burdens obtaining healthcare information" (p. 242).

This lack of access to the Internet, and consequently, technology-driven health initiatives (eHealth) information by those members of underserved populations is a global phenomenon. According to Wilkinson (2000) "there are currently more Internet hosts in New York than in the entire African continent; more hosts in Finland than in Latin America and the Caribbean" (p.1). According to Farrell and McKinnon (2003) "technology has the potential to decrease the gap in services and improve education, support, and connectedness between the client and the provider. As an alternative to traditional face-to-face contact for those in rural and geographically dispersed areas, the Internet potentially can bridge the disparities in health care access" (p. 24).

The purpose of this literature review is to (a) define eHealth, (b) examine the advantages of eHealth, (c) examine the role of eHealth in the education of underserved populations on health care related issues, and (d) to examine how this is affecting their ability to make good health-related decisions.

## METHODOLOGY

The reviewer used several electronic databases to help find information on eHealth promotion including journal articles and books. The researcher used keyword-searching methods to locate traditional and online sources on the topic and looked for common concepts of health promotion, technological access, digital divide or health information. The researcher also looked for common concepts of low-income families, rural communities, cultural diversity, racial, race, minorities, and social aspects. The descriptors included: World Wide Web, communication, technology, Internet, e-learning, distance education, digital divide, multicultural, health services, public health, women, website, health education, health information technology, economic development, delivery systems, telecommunications, telehealth, telemedicine, and globalization.

The primary database used to locate sources was Medline, a service of the National Library of Medicine. This database also included articles from additional life science and medical journals. Medline was useful in helping locate full-text articles from well-known journals and publications that discussed topics related to medicine and health. This simplified the locating sources related to eHealth promotion, health literacy, communication, technology, Internet, digital divide, health services, health education, telehealth, telemedicine, cultural diversity, race, women, underserved populations and health information technology.

Another database used to locate sources was the University of Northern Iowa's Rod Library Catalog, also know as UNISTAR. The researcher used UNISTAR primarily to locate traditional sources such as books and some research articles.

ERIC or Educational Resources Information Center was another resource used to help locate sources. The ERIC database was useful in helping the researcher to cross-check the names of the authors or articles located on the Internet to verify the credibility of the authors and the validity of the sources. To determine further credibility, the reviewer entered the authors' names into the ERIC database and found that many of the authors had several publications in the fields of eHealth, health promotion, telemedicine, health literacy, health communications, and health information technology.

The final source of locating information was World Wide Web search engines. The reviewer was able to locate full-text research articles from online journals using the following search engines: WebCrawler Search, Yahoo, Lycos Directory, Infoseek, Excite, and Fast Health. The challenge of citing resources from the World Wide Web is that the reviewer had to check the credibility of the information. This was an important issue because the reviewer recognized that anyone can publish information online that is false or misleading. To check for credibility, the reviewer found background information on the authors of to determine if the information was credible.

The primary rationale for selecting the sources described above was reliability. The reviewer recognized that having access to electronic resources would make locating sources of information fairly easy. However, because the reviewer recognized that it was her responsibility to determine the credibility and the validity of the information to be referenced in this literature review, she used the following list of criteria, for evaluating the information that was cited throughout this review:

1. Who is the author and can the authors' name be found in additional databases regarding the given topic? (Credibility)
2. Is information based on actual research and can it be verified? (Clarity)
3. Are other well-know authors used as resources for the article? (Reliability)
4. Is the information presented is a clear and organized manner? (Clarity) (Alexander and Tate, 2003).

The second rational for selecting the above sources is the reviewer's own interest in the topic of health promotion, eHealth, and the use of technology. It is the intention of the reviewer to use this literature review as a foundation for future research in the use of the Internet as a source of health promotion and health education for underserved populations.

## ANALYSIS AND DISCUSSION

### *What is eHealth?*

There are many interpretations of the term, eHealth. Most definitions seem to indicate that the term encompasses anything that is related to technology, computers, medicine, and health. According to Eysenbach (2001), "the term was first used by industry leaders and marketing people rather than academia" (p. 1). However, Bauer (2003) defines eHealth as the "use of information and communication technology to provide healthcare services and health-related information over distance (p. 242). More specifically, says Bauer (2003), eHealth refers to the "the electronic medium of the Internet, computer-based networks, and to those patients and consumers who access information from websites, use emails, or have portions of their healthcare managed online by healthcare professionals" (p. 242).

The goal of eHealth Code of Ethics (2000) is to "ensure that people worldwide can confidently and with full understanding of known risk realize the potential of the Internet in managing their own health and the health of those in their care" (p. 1). This would indicate that eHealth refers to Internet use for health related purposes by patients or health care professionals providing services to those patients. However Eysenbach (2001), suggested a broader definition of the term eHealth:

> E-health is an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies. In a broader sense, the term characterizes not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology. (p. 2)

Additionally, Rosenberg (2001), states that the *E* in eHealth, as in eLearning, eBusiness, and eUniversity could be defined as meaning *electronic*. "When technology is added to the process, then that process becomes an 'E' process" (Rosenberg, 2001, p. 131).

Since this is a rather new term, there is no clear definition of what eHealth means. Therefore, for the purpose of this study, eHealth would be considered the accessing of health-related information for the purpose of staying well, improving one's health by preventing or managing a disease, or generally improving one's quality of life by making informed decisions related to health care via the Internet.

### *Characteristics of an Underserved Population*

There are several interpretations of the term underserved populations. According to Kreps (2002), "underserved populations [are] (often comprised of those individuals who are of low socioeconomic status, possess low levels of literacy, are elderly, are members of ethnic minority groups, have limited formal education, etc)" (p. 1).

The reviewer has found that members of rural areas are also considered to be members of underserved populations. Bauer (2003) argues that rural areas have "higher percentages of people in poverty, elderly people, people lacking health insurance coverage, and people with chronic diseases. This means that (rural areas) are one of the medically neediest populations in the United States" (p. 242). According to Farrell and McKinnon (2003), these individuals are considered the 'Rural Have-Nots' and indicate that "Americans living in rural areas, regardless of income, are behind in Internet access" (p. 24).

Underserved populations are also defined as "populations that have inadequate access to, or reduced utilization of high quality health care." (Department of Health and Human Services, 2004, p. 1). Included in this category are "low literacy, rural and low-income populations, including older minority women, geographically isolated women, lesbians, hearing and visually impaired women, physically or mentally disabled women, migrant workers, immigrant and refugee women, and language minority women. (Department of Health and Human Services, 2004, p. 1)

## *The Digital Divide*

Warschauer (2001) refers to the digital divide as the "social stratification due to unequal ability to access, adapt, and create knowledge via use of information and communication technologies" (p. 1). According to the Digital Divide Network (2004), "this gap between those who can effectively use information and communication tools, such as the Internet, and those who cannot is often referred to as the digital divide." (p. 1)

Although computers are increasingly conditioning the kind of world we live in and the amount of information that we have access to, "the digital divide is a special problem in health care" (Kreps, 2004, p. 1). According to a survey conducted by the U.S. National Commission of Libraries and Information Sciences (1998), "the Internet has undergone tremendous growth in terms of users, accessible information content or what is available for consumer use, and range of services" (p. 9). Therefore, when it comes to health related issues, the Internet can play a major role in the amount and type of information that would be available to the public. According to Licciardone (2001), the Internet offers consumers unparalleled opportunities to acquire health information" (p. 1). Because of the mass of information out there, the availability of information does not seem to be the problem; rather access to that information is the problem.

Finally, the literature states that a digital divide exists among those individuals living with HIV/AIDS and those individuals who are not afflicted with HIV/AIDS. According to Kalichman et al. (2002) "the gap in Internet access precludes an entire sub-group of people living with HIV-related health communication" (p. 526). Kalichman (2002) states that this digital divide among people living with HIV/AIDS "reflects the digital divide in the more general population" (p. 526).

There are varying opinions as to the extent of the digital divide. Is it narrowing or is it growing? Researchers can not say. However, they are "nearly unanimous in acknowledging that some sort of divide does exist at this point in time" (The Digital Divide Network, 2004).

### *Barriers that Cause the Digital Divide*

According to Yach (1998), there are four barriers that impede effective access to information through the use of Internet. These barriers include:

1. Political/Economic
2. Social/Cultural
3. Ethical/Legal
4. Technical/Financial

*Political/Economical* refers to the aggressive marketing of the latest available technologies. Because of the existence of aggressive marketing, society assumes that it needs the newest technology, even though they can't afford it. According to Yack (1998) this action is risky because "new, untested costly technology could displace effective and equity oriented approaches to health" (p. 345).

Social/Cultural refers to the attitudes of the health professionals and how they manage the health telecommunications infrastructure, the type of leadership that they provide in terms of maintaining a cost effective health telecommunications infrastructure, and the type of research they conduct and programs that they help implement that would help to meet the needs of the poorer communities that they service.

Ethical/Legal refers to issues of patient confidentiality and protection of individual rights when it comes to the amount of information that is available via the

Internet. Another issue of concern is the issue of malpractice. According to Yach (1998), there are doctors who are registered in one country providing diagnostic services to patients in another country via the Internet.

Technical/Financial refers to the advancement of the technology and how it can lead to serious escalations of cost when a diagnosis can be made via the Internet, but local therapy can not be provided.

Content not only refers to the mass amount of information or content that is available via the Internet, but how that information is presented. According to Warchauer (2001), "we can bring the people to the Internet by developing people's ability in major online languages.....first and foremost in English" (p. 7). According to Graddol (1997) these online languages should also include "Spanish, French, Japanese, and increasingly, Chinese" (p. 31).

Literacy and education can affect online access at both the macro- and micro-levels according to Warchauer (2001). At the macro-level, increased literacy and education among society increases the economic development of that society. According to a study conducted by Robinson and Crenshaw (2000), there was a direct correlation between mass education and high levels of societal Internet access. On a micro-level, literacy is important because it provides the individual with the necessary skills they need to make effective use of the information that the Internet can provide.

Physical access refers to several things, including connectivity and affordability. Having access to hardware and software is a major concern when it comes to physical access. Warchauer offers additional explanations for the barriers that exist. According to Warchauer (2001), content, literacy, and physical access are also explanations for the digital divide. Yach (1998) states "many of these barriers can be addressed through rethinking the way technological progress benefits the poor" (p. 345).

### *How is eHealth Being Used?*

Literature indicates that how eHealth is being used varies among users. According to the American Telecommunication Association (2001) the use of the eHealth sites can be placed into one or more of these six categories:

1. Consumer Information Services
2. Support Groups
3. Prescription Drug Sales
4. Medical Advice and Diagnosis
5. Contract Health Services
6. Health Business and Services

Consumer Information Services refers to general health and wellness information sites. These sites are aimed at a specific population or target a specific disease. Some of these sites are managed by non-profit organizations. In addition, governmental agencies often provide information for these sites.

Support Groups refers to groups or associations that can be "accessed via Web sites, email messages on a '*list serve*' or as part of the Internet newsgroups." (ATA, 2001) Support groups do not exist to provide health care information. They are virtual discussion areas where patients and family and friends of patients can share ideas regarding their specific health issues.

Prescription Drug Sales refers to those websites that sell prescription medications and non-prescription drugs to consumers on-line. Some sites are affiliated with major drug stores and some act independently. Medications ordered from these sites will be delivered to the consumer via the mail.

Medical Advice and Diagnosis refers to those sites that provide answers to specific questions submitted by patients. Some sites provide actual medical *consultations* that will include a diagnosis and will issue a drug prescription and treatment plan based on information provided by the visitor to the site. Some questions are answered for free, however, consumers may be charged for those services that include providing medical diagnosis and treatment. Medical insurance does not cover these services and expenses are paid out of pocket of the consumer. Furthermore, there are ethical and medical issues surrounding providing this kind of service for a patient that has never received face-to-fact treatment by the practitioner.

Contract Health Services refers to sites that are designed to provide specific information for a target group of patients. These sites provide services under contract in connection with an insurance plan or employers of the patients. The site provides specific content related to the insurance plan and its benefits.

Health Business Support Services refers to those sites that provide assistance to health professionals and healthcare organizations via the Internet. The types of assistance that they provide are often administrative in nature and relate to financial billing or maintaining records. The goal of these sites is to transition traditional business services into Web-based services.

Additionally, research conducted by Pandey, Hart and Tiwary (2003), indicated that there are three exploratory models that can be used to explain women's use of the Internet for health information purposes. Those three models include:

1. Health and Wellness Model
2. Health Needs Model
3. Search Cost Model

According to Pandey et al. (2003) The Health and Wellness Model is based on the fact that women turn to the Internet for their health information needs because the Internet has become such an integral part of our everyday lives. Pandey based this information on two factors: (a) an increase in the number of women who have access to the Internet, and (b) the usage patterns of women using the Internet. Based on research done by Pitkow and Kehoe (1996), ten years ago the United States continues to integrated female users in to the World Wide Web at a faster pace than Europe.

Pandey et al. (2003) refers to the Health Needs Model because it "posits a pro-active approach to the use of the Internet" (p. 182). According to this model, Pandey et al. (2003) states, "women turn to the Internet when they want to learn more about a disease that directly affects their lives, whether it be for a family member or for themselves" (p. 182).

The last model that Pandey et al. (2003) refers to is the Search Cost Model. The Search Cost Model is based on the idea that women use the information that they find on the Internet to help save the time and effort that is involved in seeing a doctor in a face-to-face visit. "Women who face greater time pressures in their daily lives will turn to the Internet as a source of health information" (Pandey et al, 2003, p. 182).

## *Is eHealth Effective?*

"Today's health care demands that consumers of health care participate in their own care through prevention and treatment" (Wyatt, 1999, p. 87). The amount of information that can be accessed through the use of the Internet is definitely a benefit for the user or patient. Pandey et al. (2003) refers to this as a "free flow of information", which allows the user to find a variety of sources of specific information regarding different health related issues (p. 183). According to Warchauer (2003) "health sites are among the most widely used on the Internet" (p.189). Green and Himelstein (1998) found that "46% of online users sought information via the Internet about a medical or personal problem" (p. 153).

The use of the Internet for health related purposes has enabled an individual to research information conveniently, anonymously, and without fear of the societal backlash that going to a doctor's office can cause. According to Pandey et al. (2003), the Internet "is particularly helpful in discussing painful and personal aspects of health" (p. 183).

Warchauer (2003) found several different websites in which women of different social, economic, and educational background freely shared information regarding their treatment for infertility. According to Warchauer (2003) "these online forums play a critical role in people's health" (p. 189). Through the use of these websites, these women provide social support, as well as medical and financial advice to other women in similar situations. Warchauer (2003) states "these types of groups would be virtually impossible to organize on a face-to-face basis, and provide an example of how the Internet can facilitate access to new forms of social capital" (p. 919).

There is also the issue of the gender gap that exists in the doctor-patient relationship. According to Warchauer (2003), "doctors in the United States...are disproportionately male" (p. 189). However, women are usually the primary care givers.

According to a nation-wide survey by Schable, Diaz, Caldwell, Conti, Alston, Sorvillo, Checko, Hermann, and Davidson (1995) "the most common primary caretakers for all children within a family unit were the mother alone at (46%)" (p. 1). Consequently, "women in the United States are particularly burdened by this hard-to-negotiate health care system (Warchauer, 2003, p. 188). Additionally, women are more likely to not have the health insurance they need in order to adequately care for themselves or their families. A 1996 survey indicated that "more than 70 percent of white women had either private or public insurance coverage, compared with about 58 percent of black women and 54 percent of Hispanic women" (Agency for Healthcare Research and Quality, Health Care for Minority Women, 2002, p. 1). Therefore, states Warchauer (2003), "it is not surprising that women have turned to the Internet in large numbers to seek information, support, and solidarity about their health concerns" (p. 189). Warchauer (2003) believes "the Internet's most important role may be to allow people to simply find each other" (p. 188).

### *Making Good Health-Related Decisions*

Obtaining information from the Internet is often the basis for making health decisions. One recent survey of 520 current health information users indicated that:

> A significant difference existed between sicker patients and those with better self-reported health status in that sicker patients were more frequent users of Internet health information, more likely to search for specific information, more frequently participating in chats, and more likely to discuss the information they found online with their health care provider" (Houston, 2002, p. 8). Additionally, a survey of patients in a hospital-based practice indicated that "most users of

> Internet rate the quality of Internet-based health information equivalent to information from their doctor. (Houston, 2002, p. 1).

However, Pandey et al. (2003) argues that "although the Internet cannot substitute the one-on-one relationship between an individual and a healthcare provider, it does provide a rich alternate source of health information-one that is available 7 days a week on a 24 hours basis and allows for different level of interactivity with the information provider" (p. 183).

Kirsh and Lewis (2004) state that "active patients and family members require more information to effectively communicate with healthcare providers, maneuver within a sophisticated healthcare system, and care for themselves" (p. 8). According to Kalichman, Weinhardt, Benotsch, and Cherry (2002) having "access to and effective use of health information can motivate individuals with chronic illnesses to actively participate in their health care, engage in health promoting behaviors and improve their health" (p. 523). In one study, Murray (2003) found that "taking information to the physician was perceived as beneficial by the patients, with 83% reporting that they felt more in control, and 78% stating they felt more confident during the consultation as a result" (p. 1731). Houston (2002) asserted that "health care professionals should be aware that their patients with lower health status who have used the Internet for health information are likely the ones to come to them to discuss the information they have found" (p. 10).

However, for those members of underserved populations, obtaining this information is a challenge, if it is at all possible. There have been some ground-breaking efforts to increase access to health information through the Internet in developing countries, as well as here is the United States. However, "the ratio of people who have access to the Internet to those who do not is currently 1:5000 in Africa, compared to 1:6 in the United States or Europe." (Wilkinson, 2000)

The effects this has on the health of these underserved populations are numerous. According to Kreps (2002), since there is a lack of access to effective heath information, these underserved populations are "subject to serious disparities in health care and generally have much higher rates of morbidity and mortality due to serious health threats than the rest of the public" (Kreps, 2002).

Economically, the digital divide can have a direct effect on health care practices of a community. According to the Digital Divide Network:

> Communities with the tools and skills to compete in the digital economy are at a distinct advantage over communities that don't. A community with a well-educated, technology-literate population is more likely to attract and sustain new businesses, and these new businesses in turn attract more well-educated, technology-literate people into the area. Conversely, a community that lacks reliable access to technology and the skills to use it is less likely to attract and sustain new businesses that could potentially serve as a catalyst to economic prosperity. (p. 1)

Warchauer (2001) argues that "mass education accelerates this structural (economic) transition" and that "as a simple extension of logic, the demand for computer and online skills will be driven in part by the degree of education in the population" (p. 5).

The Internet is an influential force in the health-related, decision-making process.

There is still a lot of work to be done. Because, according to Wilkinson (2000), "despite the Internet being hailed as one of the potential solutions to improving the health of populations in developing countries, the current digital divide is far more dramatic than any other inequity in health or income" (p. 1).

## CONCLUSION AND RECOMMENDATIONS

There are several ways in which the Internet is being used to enhance user knowledge of their personal medical concerns. Health-related websites are providing users with access to consumer information, support groups and the medical advice they need. The results is a population educated about their health needs.

The current review showed that underserved populations not only benefit from the use of the Internet for health-related purposes, but that, in some cases, it was preferred because of the privacy that it provided for the user or patient.

The literature states that the Internet plays a significant role in the doctor-patient relationship. There was a direct correlation between the level of motivation of the patients who did research about their particular health issue on the Internet and those who had not prepared themselves through research. The individual's level of education and income played an important role in the who used the Internet to access health information.

However, the reviewer found that the digital divide plays a significant role in the lack of access certain individuals have to health information via the Internet. Research indicates that this digital divide will increase unless issues of economics, literacy, and language are addressed when developing health-related websites.

With the constant changes that are taking place within the area of health and the extensive use of the Internet as a resource for researching health related information, there is an opportunity for the development of a definition that would clarify exactly what eHealth means. Currently, there are several different interpretations of eHealth. A more developed definition would enable researchers to focus their attention on its effectiveness and how it serves to educate not only underserved populations, but the overall population on health related issues.

In addition to establishing a more effective eHealth approach, increased access to that information is needed. Policy changes need to take place that would enable these underserved populations to have access to this information. Kreps (2002) suggested that "new strategies and policies need to be developed to help these underserved populations access relevant health information which would help them make informed health-related decisions about seeking appropriate health care and support, resisting avoidable and significant health risks, and promoting their health" (p. 1). By considering the effects that technological progress has on underserved populations when developing policies, policy makers could ensure that everyone will benefit from having access to health related information through the use of the Internet. The establishment of programs that would provide training on how to access this information are also needed. Issues such as language and cultural barriers need to be addressed if we want to ensure that everyone has equal access to the information.

Understanding and improving health for underserved populations depends on effective health communication. Those members of the underserved populations will need to have equitable access to technology and online services in order to close the gap between those who have access to health-related information and those who do not have access. By working to bridge the Digital Divide gap in effective health care communication, we will ensure that everyone is being provided fair and effective access to technology, and that the health care needs of everyone are being met equally. What we need is a borderless; racially, economically, and culturally blind; fully-integrated health system that will be accessible from anywhere, to everyone. This will ensure that everyone will have access to the same health information, which will empower the individual to make good health-related decisions. In the words of Healthy People 2010 we need to "…change the social climate to encourage healthy behaviors, create awareness, change attitudes and motivate individuals to adopt recommended behaviors" (2004, p. 2). It is only through these efforts that the benefits of technology-supported health access will be available for all.

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