Applied Developmental Psychology 22 (2001) 49–59

Applied Developmental Psychology

Adolescents, the Internet, and health Issues of access and content

Dina L.G. Borzekowski*, Vaughn I. Rickert

Adolescent Health Center, Mount Sinai School of Medicine, 320 East 94th Street, New York, NY, USA

Abstract

As the Internet grows in popularity and importance, many have raised concerns over access and content, especially with regard to young people and health information. This paper begins with a brief discussion on Internet access issues. It follows with a section addressing Internet health content and provides a critique of three examples of current Internet health Web sites. Data are then presented from a preliminary survey on the Internet use of two distinct samples of New York City adolescents ($N=319$). It was found that adolescents of dissimilar socioeconomic and ethnic groups access and use the Internet, with a large percentage seeking health information. The paper concludes with recommendations for future health Web sites targeting adolescents. © 2001 Elsevier Science Inc. All rights reserved.

Keywords: Internet; Health; Adolescents; Information; Web; Access

1. Introduction

Unlike other mass media, the Internet can reach narrowly targeted audiences with countless insights on a range of personal and social concerns. Young people, who are familiar and comfortable with this medium, may access important content that can improve their physical and psychological health. Little nonproprietary data, however, is available on whether and how adolescents actually use the Internet to learn more about and improve their health.

In this paper, we begin by describing issues around access to the Internet. Then, we discuss the range of content that can be found through this medium regarding health

* Corresponding author. Tel.: +1-212-423-9829.
E-mail address: dina.borzekowski@mountsinai.org

0193-3973/01/$ – see front matter © 2001 Elsevier Science Inc. All rights reserved.
PII: S0193-3973(00)00065-4

information. As part of this section on content, we critique three examples of current Internet health Web sites. We then present a preliminary study on Internet use, drawing from data collected from two distinct samples of New York City adolescents. After discussing the results of this study, we conclude by providing recommendations for improving health-related Web sites targeting adolescents.

2. Adolescent access to the Internet

For adolescents to obtain health information from the Internet, they must first gain access to this technology. Concerns regarding access are particularly acute for disenfranchised and minority groups who may be less able to afford the necessary hardware and software. The Internet access issue might be remedied in part, though, through public access from locations such as schools and libraries. In fact, efforts made in the 1990s to improve public Internet access have been quite successful (National Telecommunications and Information Administration and US Department of Commerce, 1998). This bipartisan agenda received public and private support and, by 1996, 65% of public high schools and 77% of public libraries had Internet links (Heaviside et al., 1997). In 1998, 84% of public libraries were connected to the Internet in some capacity with 73% offering public access to the Internet (Bertot & McClure, 1998).

Public points of access can serve as an equalizer, providing individuals with Internet connections regardless of income and education. Continued public and private support allow economically disadvantaged and geographically remote communities necessary and affordable services and upgrades. Throughout the US, some 80,000 schools and libraries have employed the E-rate program to secure discounted rates for telecommunication services (National Telecommunications and Information Administration and US Department of Commerce, 1999). As well, the computer industry and less advantaged community groups have been forging partnerships. "Plugged In" represents one such partnership. This group facilitates the training of poor minority youth to create Web pages and it is located in downtown East Palo Alto, a city known for its high crime and poverty rates despite its proximity to affluent communities in Silicon Valley (Lacey, 2000).

Besides public access, the increasing affordability of computers has allowed Internet use levels to climb at steady rates across ethnic groups (National Telecommunications and Information Administration and US Department of Commerce, 1999). The number of Black and Hispanic households that owned home computers doubled from 1994 to 1998. Internet use (as defined by owning a modem) also increased steadily in the past few years. In 1989, less than 2% of Black and Hispanic (as compared to an overall national percentage of 3%) households had Internet access. By 1997, the number of connected households increased to 12% (compared to an overall national percentage of 26%) (National Telecommunications and Information Administration and US Department of Commerce, 1999). What separates users from nonusers, though, appears to be income and education (Ervin & Gilmore, 1999; Hoffman & Kalsbeek, 1996). In households with an average annual income greater than US$75,000, there were no significant differences between white, Black and Hispanic families with regard to computer ownership (National Telecommunications and Information

Administration and US Department of Commerce, 1999). A "digital divide" between ethnic groups becomes apparent at lower income levels. According to a recent Federal study, among households with annual incomes between US$15,000 and US$35,000, a third of white families compared to a fifth of Black and Hispanic families owned computers (National Telecommunications and Information Administration and US Department of Commerce, 1999).

3. Health-related content on the Internet

The majority of US adults agree that "people should take primary responsibility for their own health and not rely so much on doctors" (Yankelovic MONITOR survey cited in Miller & Reents, 1999). The Internet allows consumers to educate themselves on a variety of health-related topics from diseases to prescription drugs, before and after they go to a doctor's office. It lets Internet users ask targeted questions of their doctors and obtain additional opinions and links to online support groups and individuals. During 1998, over 17 million US adults searched this medium for health and medical information (Miller & Reents, 1999), a 43% increase compared to the prior 12 months (Cyberdialogue, 2000). In 2000, more than 33.5 million adults are expected to seek health information online (Cyberdialogue, 2000). This report also indicates that 35% of all US adults are online and, of these, 38% have used the Internet for health and medical information over the last year (Cyberdialogue, 2000). Other sources concur that approximately 40% of adult Internet users have researched health information (Miller & Reents, 1999). Of those receiving health and medical information, 52% retrieved information on diseases, 36% diet and nutrition, 33% pharmaceuticals, 32% online health newsletters, 31% women's health, 29% fitness, 15% children's health, and 13% illness support groups (Miller & Reents, 1999). Reviewing these statistics, we wondered whether and what types of Internet health information adolescents would try to obtain. A search of both the academic and marketing literature, however, revealed no current data on such adolescent use of the Internet.

4. Health-related Web sites: Three illustrations

Although data on use patterns are unavailable, there are Internet health information sites that target adolescents and teens with health information. In Spring 2000, colleagues involved in either health communication or adolescent medicine provided the authors with the names and URLs of health sites that could serve as examples of existing Internet resources. From two dozen suggestions, we found three that clearly illustrated the range of qualities and further the current dialogue on adolescent Internet health sites: zaphealth.com, cyberisle.org, and not-2-late.com. In the following paragraphs, we provide qualitative descriptions of these three sites, evaluating features that include: perceived purpose, intended audience, ease of use, interactivity, use of advertisements, and links. These evaluation criteria derived from a sample of urban adolescents (from two multigrade classes with 20 students each) with whom we discussed the features that could be used to judge adolescent health Web sites.

4.1. Zaphealth.com

Zaphealth is a health site for adolescents with the byline "when you can't ask mom." Designed to "help young people deal with health problems and make informed decisions about their own health and lifestyles" (http://www.zaphealth.com, Spring 2000), the information appears in a nonjudgmental, unbiased, and informative style, clearly aimed at a young audience. Included is a comprehensive list of topics that adolescents might be interested in, such as eating disorders, relationships, sexually transmitted diseases, and even a section called "bad smells." The site is easy to navigate with opportunities to write in questions or search by topics. Additionally, chat rooms and topic-specific bulletin boards are available.

Though this site is commendable in creating a health-specific site for adolescents, the advertising banners at the top and bottom of the page may be problematic (even though the advertising policy indicates that site content and advertisements will be separate). Zaphealth also mentions that site content will not be dictated by advertising relationships, that they do not endorse any product or service advertised on the site, and that viewers should use their own discretion when reading these advertisements and buying related products. Nevertheless, such an advertising policy seems contradictory, since accepting certain advertisers (and not others) sets up a situation where the average adolescent would and should not believe that the host site is indifferent to the included advertisements.

4.2. CyberIsle.org

CyberIsle.org, created by TeenNet, is a "network of collaborating partners directly involved in education and health promotion with youth" (www.cyberisle.org, Spring 2000). The site is guided by five principles: (1) participation, (2) relevance, and (3) support of adolescent autonomy, (4) active learning, and (5) accessibility. Designed with adolescents' assistance, the site feels like an adolescent's room, disorganized and hard to understand but with some recognizable parts. Within CyberIsle are seven rooms, including men's and women's washrooms, a beach, and a Cyberia (a hangout place).

Few words direct CyberIsle visitors to any specific room or links within a room. Navigating through the site, clicks on various icons (ashtrays, people, table tops) will transport the user to new Web pages. This makes for a complicated navigation system. It is unclear, unless attention is directly paid to Internet URL addresses, where one will wind up after a mouse click. Sometimes, it is a health prevention page within the CyberIsle domain, other times, one has left CyberIsle and has been transferred to another host's Web site. This is disorienting and requires a very competent Web surfer to know how to get particular information without getting launched to other Web sites (some that are health focused, others that are not).

Internal and external links are of serious concern with regard to health Web sites for adolescents. Though there are no advertisements on the CyberIsle pages, direct links can bring a user to commercial music or movie (i.e., music.com or movie.com) Web site outside of the TeenNet network. Additionally, some CyberIsle links seem tailored to a Canadian youth audience (the site originates out of the Department of Public Health

Sciences at the University of Toronto) and this makes some links less relevant to a broader adolescent audience. This site would benefit from clearer principles organizing links and a reduction in the numerous commercial links that may be inappropriate for a health Web site targeting youth.

4.3. Not-2-Late.com

The Not-2-Late site run by the Office of Population Research at Princeton University is a Web site about emergency contraception. It is part of a national campaign to inform people about emergency contraception methods, where to find them, and how to get them. This straightforward site contains few graphics and a substantial amount of text, which can be read in English or in Spanish. We felt that the most valuable part of this site was the searchable database, where a visitor could enter geographical information and obtain a list of nearby sites and providers who supply emergency contraception. Though the site is not specifically designed for an adolescent audience, it concerns an issue that might attract young visitors. There is a "frequently asked questions" page that answers adolescent focused questions such as "Is it possible to obtain emergency contraception without parents' knowledge or consent for minors?" No advertisements appear on the Not-2-Late site, and it is explicitly stated that there is "no connection whatsoever with any companies that manufacture or sell emergency contraceptives" (www.not-2-late.com, Spring 2000).

While the site is informative and interactive, its sophistication and text-based material may be too difficult for an adolescent to understand. There are opportunities to ask questions, however, and the search engine is easy to use. The information within the site is targeted and useful, but it does not go beyond emergency contraception to other realms of health information. In this sense, it serves only a limited role in acting as a health site aimed at adolescents. This Web site can act as a model for other health sites, because of its simple but dynamic design, easy navigation, lack of advertisements and endorsements, and lack of ambiguous links.

5. A preliminary study of adolescent Internet use and health information

After reviewing the adult literature and many existing adolescent Internet sites, we designed an exploratory study to assess whether and how adolescents use the Internet to gather health information. To this end, we identified two samples of New York City adolescents: one from a health center, the other from an elite high school. Respondents were asked to complete a pencil-and-paper survey to describe their access, frequency of use and comfort levels regarding general Internet use. In addition, we asked whether they had ever used the Internet to get health information and if so, what types of information had they tried to obtain. Lastly, we asked about the value they placed on using the Internet as an information source on a range of topics.

Given "digital divide" concerns, we assumed that adolescents from the health center would access the Internet with much lower frequency than those from the elite high school. Beyond this, no other hypotheses were made.

5.1. Sample and methods

To understand how and if adolescents use the Internet, especially for health information, we collected data in the Fall of 1999. The first sample came from a health center serving ethnically diverse and disadvantaged youth from Central and East Harlem. This group consisted of 145 adolescents, aged 13–21 years (mean = 17.3 years, S.D. = 1.9), where 81% were either Latino American or African American. The second sample consisted of a randomly selected group of high school students (9th through 12 grade) from an elite Upper East Side independent high school. There were 173 boys and girls in this group. The mean age was 15.7 years (S.D. = 1.2) and 82% were white.

For this study, we used a 50-item, pencil-and-paper survey. We created media use measures (modeled after existing media use surveys) and found reliability to be high for question batteries about Internet use and perceived value of Internet information across health content areas (alpha coefficients ranged 0.71 to 0.86). This allowed us to assess the overall reliability of the measures since they were adaptations of other batteries). At the health center, all adolescents, other than those coming for urgent care/sick visits, were asked to complete our anonymous and voluntary survey while they waited for their appointments. At the high school, randomly selected homerooms were chosen and all students were invited to participate. In both locations, few adolescents declined to do the survey; however, specific refusal statistics were not recorded. On average, adolescents completed the survey in 8–10 min.

5.2. Results

We expected that health center adolescents' Internet use rates would be much lower than those of the elite high school students. While use rates differed significantly ($\chi^2 = 26.1$, $df = 1$, $P < .001$), we found that Internet use was widespread among these urban adolescents. Practically all (99%) of the elite high school students and 83% of the health center adolescents said that they used this medium. On frequency of Internet use, 39% of elite high school students in comparison to 20% of health center adolescents said that they used the Internet 6–7 days a week ($\chi^2 = 59.0$, $df = 5$, $P < .001$). Among the elite high school students, a quarter of the sample (26%) indicated that they used the Internet for a half-hour or less per week and another 17% reported using the Internet 5 or more hours a week. For the health center adolescents, around half (51%) used the Internet for a half-hour or less per week while 12% reported 5 or more hours of use per week. Of the elite high school students, 34% said they were "extremely" comfortable with the Internet compared to 17% of the health center adolescents who reported these levels of comfort. Over half (56%) of the health center adolescents, however, said that they were "pretty" or "extremely" comfortable using the Internet. Differences existed between the groups with students indicating higher comfort than center adolescents ($\chi^2 = 34.2$, $df = 4$, $P < .001$), but few adolescents from either group were uncomfortable with this medium.

Adolescent Internet users reported accessing the Web from multiple locales. Among all adolescent Internet users, 20% accessed the Internet from one place, 33% from two, 24% from three, 14% from four, and 9% from five or more places. Elite high school students differed significantly from health center adolescents in the number of places they accessed the

Internet ($\chi^2 = 58.4$, $df = 5$, $P < .001$). While twice the percentage of elite high school students (70%) accessed from two or three places compared to the percentage of health center adolescents (39%), similar percentages of elite high school students (24%) and health center adolescents (21%) accessed from four or more locales. Only 6% of elite high school students accessed from just one locale in contrast to 41% of health center adolescents.

Almost all (97%) the elite high school students reported home use of the Internet. This was significantly different than the 52% of health center adolescents who said that they used the Internet from home ($\chi^2 = 84.8$, $df = 1$, $P < .001$). Most elite high school students (90%) reported Internet use at school compared to 66% of the health center adolescents who were currently in school ($\chi^2 = 34.4$, $df = 1$, $P < .001$). Compared to the elite high school students, more health center adolescents used the Internet at another family member's house (32% vs. 14%, $\chi^2 = 13.9$, $df = 1$, $P < .001$) or a community center (6% vs. 1%, $\chi^2 = 5.1$, $df = 1$, $P < .05$). Similar percentages of elite high school students and health center adolescents used the Internet at the library (overall 36%) or at a friend's house (overall 40%).

When asked "Have you ever tried to get health information from the Internet?," 42% of the health center adolescents responded "yes" and, interestingly, this was not significantly different from the 43% of elite high school students, who also responded "yes." Examining the sample by gender and ethnicity, we observed no significant associations for trying to get health information from the Internet. Among those who had tried to get health information from the Internet ($N = 126$) from both groups, 50% said that they had tried to get information on different diseases (i.e., cancer, heart disease, STDs, etc.), 37% on diet and nutrition, 33% on fitness and exercise, 27% on sex (i.e., sexual activity, contraception, pregnancy, etc.), 25% on alcohol and drug abuse, 18% on mental health issues, 19% on medicines and pharmaceuticals, 13% on violence among peers/gangs, 8% on tobacco and smoking, 7% on parenting and children's health, 6% on emotional or physical abuse, 5% on sexual abuse, and 3% on illness support groups. Comparing health center adolescents to high school students, significantly higher percentages had tried to obtain information on sexually transmitted diseases (50% vs. 16%), sexual behaviors (50% vs. 11%), peer/gang violence (23% vs. 5%), dating violence (14% vs. 3%), parenting (17% vs. 0%), emotional abuse (12% vs. 1%), and sexual abuse (10% vs. 1%).

Adolescents reported that they thought the health information on the Internet to be reliable, with only a quarter suggesting that available information was "not at all" or "a little" reliable. There was an overall consensus from both groups that general health information on the Internet was valuable; 55% responded it was "very" or "extremely" worthwhile. When asked about specific health topics, 77% of the adolescents indicated that it was "very" or "extremely" worthwhile to have Internet information on emotional and sexual abuse. Seventy percent thought it "very" or "extremely" worthwhile to have antiviolence information, 62% for contraception information, 56% for diet and nutrition information, and 31% for antismoking information.

5.3. Discussion

The first area that we examined was Internet use and access, particularly as it relates to adolescent groups characterized by their socioeconomic status and ethnic differences. As

expected, we found the elite high school students to be technologically savvy, having high levels of both Internet access and comfort with the medium. These adolescents attend a school that costs close to US$21,000 a year and e-mail accounts are provided to each student through a school server. We were, however, surprised by the access and comfort levels reported by the health center adolescents. Health center adolescents, of whom 70% report having no health insurance, were using the Internet at rates higher than predicted. During the Internet's early emergence, many voiced concern over whether and how underserved populations might be a part of the Information Revolution. This study offers promising data suggesting that less privileged youth manage to get Internet access. These findings reflect initiatives to provide Internet links through public schools and libraries, and should encourage continued support of facilitated access for users regardless of gender, age, ethnicity, geography, and socioeconomic status.

This preliminary study, indicates that among the elite high school students, the few nonwhites did not differ from the whites with regard to Internet access and use. In the health center sample, nonwhites and whites also exhibited similar Internet patterns. Most of the significant differences between the two samples would appear to be the result of differences in socioeconomic status. Although efforts were made by less advantaged adolescents to access and use the Internet, a "digital divide" along income lines was apparent.

The second area we examined was whether adolescents sought out health information from the Internet. This study suggests that a substantial proportion of adolescent Internet users, like adult Internet users (for whom, there are some published statistics), access the Internet to find health information. Furthermore, percentages from this study indicate that adolescents seek similar health information as that which is sought by adults. Interestingly though, when one compares topics singled out by the two different groups, variations emerge. Health risk behaviors, such as engaging in unprotected sexual activity or physical and sexual victimization, which have urgent short-term consequences, were the topics more often chosen by health center adolescents. One qualification with these results is that the adolescents from the health center may have been more inclined to seek out health information than their peers who do not use a health center.

The final area we considered was how valuable urban adolescents felt it was to be able to access Internet health information. Overwhelmingly, adolescents of all socioeconomic and ethnic groups indicated that having general and targeted health information available through this medium was worthwhile. Few thought that Internet health information was unreliable.

The results from this preliminary study are promising, suggesting the continued support of adolescents accessing and using the Internet for health information may be beneficial. Additional research conducted by our group and others ought to investigate the areas and issues raised by this work — specifically, the access and use of web-related health information by youth from different racial and ethnic groups and different social strata and the most efficacious ways of conveying this information to specific youth populations.

To benefit current and future adolescent users, we urge that Internet health information be interesting, understandable, relevant, and secure. Raised on television, video games, and computers, most adolescents come to expect well-produced appealing media. Other media options are a remote control or mouse click away; therefore, it is vital to capture the users'

attention. Similar to television, which combines macro features (action and pace), visual micro features (pans, zooms, and fades) and auditory micro features (dialogues, sound effects, and music) (Calvert, 1999), Internet sites must include and merge attention-keeping qualities. Additionally, Internet sites ought to take advantage of this medium's interactive nature. The case sites described earlier all benefit from having interactive components. We believe that electronic pamphlets, which characterize many existing sites, are less likely to entice the adolescent user to seek information, regardless of his or her involvement and information needs. Specific to this medium, Internet sites can engage the user by providing tailored information, a feature often used in effective health communication (Slater, 1995). For example, an antismoking Web site might be more appealing (and constructive) if it obtains data on the adolescent's likes and dislikes, personal and interpersonal experiences, habits regarding number of cigarettes smoked per week, and readiness to change before it offers personalized advice on smoking cessation.

Health information provided through the Internet must be made understandable to the adolescent user. Web sites should explain technical terminology and avoid confusing medical jargon. Taking advantage of the layered aspects of Internet sites, additional explanations can be linked to provided information. Furthermore, these explanations can be directed at the user's cognitive strengths. As an illustration, the ways that a Web site provides information on the daily challenges of living with asthma might vary if the adolescent indicates preferences for video rather than text. The Internet is one medium that can effectively alter the presentation of information in relation to young peoples' intelligence, which can include skills in linguistic, logical–mathematical, spatial, musical, bodily kinesthetic, interpersonal, and intrapersonal areas (Gardner, 1993). Using formative evaluations, Web designers should examine if and how adolescents understand given sites. Finally, it is important that Web sites offer information in languages other than English to serve the growing population of non-English-speaking adolescents in the United States.

General health Web sites can serve as an entry point, but to better serve the adolescents, sites should provide targeted information. While adults and adolescents share common health problems such as alcohol/drug abuse, depression, nutrition and weight control, physical exercise, and depression (Jinks & Daniels, 1999; Waters, Wake, Toumbourou, Wright, & Salmon, 1999), unique concerns reflect the different generational experiences. For adults, concerns include cancer, diabetes, and lung and/or heart disease (Cowley, 1999) and for adolescents, concerns include depression, social stressors, and unsafe sexual practices (Hampton, 2000). Even if health concerns are similar, the resources and viable treatment approaches might differ. If an adult wanted to use birth control pills, she might schedule an appointment with her primary care physician and that exam (and even the prescription) might be covered by her health insurance. In contrast, an adolescent who is uncomfortable or unwilling to approach this need with her pediatrician or family care provider might have to locate a subsidized adolescent health clinic and consult with the health center staff. It is vital that health Web sites for adolescents provide current, relevant, and realistic information to address an individual adolescent's health needs.

Most importantly, health Web sites for adolescents must be safe, secure, and confidential environments. Proposed by the American Medical Association, "health Web sites must adhere to strict personal privacy codes to prevent individual's personal medical information,

including patterns of use and interests, from involuntarily entering the hands of marketers, employers, and insurers" (Winker et al., 2000). In April 2000, the Children's Online Privacy Protection Act (COPPA) became law. This law, enforced by the Federal Trade Commission, protects children under the age of 13 from being asked to provide personal information that would facilitate direct marketing. We believe that when any individual, regardless of age, attempts to access a health information Web site, such protection should be in place as well. Health information is personal and sensitive and should not be linked directly to the individual.

As previously discussed, when evaluating the sample health sites, advertising and links to commercial sites undermine a health site's credibility and security. Public health and educational organizations might sponsor adolescent health sites, ensuring that vulnerable youth can retrieve content without serving as a captive market. In addition, the potential biases that may result from funding and competing interests should be obvious and offered upon site entry.

6. Conclusion

In conclusion, few published studies consider the adolescent user of the Internet, and we are aware of no peer-reviewed studies that focus on adolescents, the Internet, and health. There is a tremendous need to examine existing sites and to better understand whether and how adolescents use the Internet for health information. Currently, we are collecting survey data from a representative sample of 3000 urban, suburban, and rural New York State 10th graders on media use and health information sources. Results from this research should inform the discussion of how youth use traditional and new media. Similar to the television and children research, Internet research should include content analyses along with cross-sectional, longitudinal, and experimental studies. Further information should be gathered on messages conveyed through the Internet, as well as how those messages impact youth. Through such research, we will be able to maximize the potential of this new health communication medium.

References

Bertot, J. C., McClure, C. R. (1998). The 1998 National Survey of Public Library Outlet Internet Connectivity. American Library Association Office of Information Technology Policy. http://www.ala.org/library/fact26.html.

Calvert, S. L. (1999). *Children's journeys through the information age*. New York: McGraw-Hill.

Cowley, G. (1999). So, how's your health? *Newsweek*, *134*, 48–49 (August 2).

Cyberdialogue (2000). http://www.cyberdialogue.com/resource/data/cch/index.html#data.

Ervin, S., & Gilmore, G. (1999). Traveling the superinformation highway: African Americans' perceptions and use of cyberspace technology. *Journal of Black Studies*, *29*, 398–407.

Gardner, H. (1993). *Multiple intelligences: the theory in practice*. New York: Basic Books.

Hampton, H. L. (2000). Adolescent gynecology: examination of the adolescent patient. *Obstetrics and Gynecology Clinics of North America*, *27* (1), 1–18.

Heaviside, S., Riggins, T., & Farris, E. (1997). *Advanced telecommunications in U.S. public elementary and secondary schools, Fall 1996*. US Department of Education, Office of Educational Research Improvement. National Center for Education Statistics (March).

Hoffman, D. L., & Kalsbeek, T. P. (1996). Internet and Web use in the U.S. *Communication of the Association for Computing Machinery*, *39* (12), 36–46.

Jinks, A. M., & Daniels, R. (1999). Workplace health concerns: A focus group study. *Journal of Management in Medicine*, *13* (2–3), 95–104.

Lacey, M. (2000). Clinton hopes to raise Indian Internet use. *The New York Times*, A23 (April 18).

Miller, T. E., & Reents, S. (1999). [online] The health care industry in transition: the online mandate to change. Available at: http://www.cyberdialogue.com.

National Telecommunications and Information Administration and US Department of Commerce. (1998). *Falling through the Net II: New data on the digital divide*.

National Telecommunications and Information Administration and US Department of Commerce. (1999). *Falling through the Net III: Defining the digital divide*.

Slater, M. (1995). Roles of media in community-based health promotion. In: E. Maibach & R. L. Parrott (Eds.), *Designing health messages* (pp. 186–198). Thousand Oaks, CA: Sage.

Waters, E., Wake, M., Toumbourou, J., Wright, M., & Salmon, L. (1999). Prevalence of emotional and physical health concerns amongst young people in Victoria. *Journal of Pediatrics and Child Health*, *35* (1), 28–33.

Winker, M. A., Flanagin, A., Chi-Lum, B., White, J., Andrews, K., Kennett, R. L., DeAngelis, C. D., & Musacchio, R. A. (2000). Guidelines for medical and health information sites on the Internet. *Journal of the American Medical Association*, *283*, 1600–1606.