Self-Presentation on the Web: Agencies Serving Abused and Assaulted Women

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Internet use is nearly ubiquitous in the United States, particularly among adolescents.[1,2] A great majority of online adults and adolescents use social media such as Facebook, Twitter, and Pinterest.[2,3] Thus, public health agencies can use multiple online platforms to make and keep their work accessible to the public.

A growing number of studies record the prevalence, promises, and problems of online health resources. Some have analyzed Web site content to document function and usability.[4–9] Others have focused on users and concluded that the Internet is a particularly effective way to reach people with stigmatized health problems (e.g., depression, herpes, urinary incontinence); because of the anonymity it allows, the Internet is their preferred source of information.[10] In this study, we focus on agencies serving women victims of violence, specifically sexual assault and intimate partner violence. We chose violence against women because, like other conditions with multiple negative health outcomes, it is a stigmatized phenomenon despite its high prevalence in the population.[11] In addition, the delivery of information on violence prevention via the Internet is particularly important to young people because first incidents of intimate partner violence and sexual assault occur relatively early in life (about 70% of first assaults occur by 24 years of age)[11] and young people are more likely than older persons to use the Internet.[1,2]

Previous studies about Web sites specific to violence against women are few, include little about sexual violence, and do not analyze the Web sites themselves.[12–16] The sole exception, which examined 172 police department Web sites for domestic violence survivors, reached 2 conclusions: the posted information was insufficient, and the design was focused on the perspective of the Web site creator rather than that of the end user.[17]

We examined the service and marketing functions as well as the usability of the Web sites of 261 agencies that serve women victims

Objectives. We examined the content and usability of the Web sites of agencies serving women victims of violence.

Methods. We entered the names of a systematic 10% sample of 3774 agencies listed in 2 national directories into a search engine. We took (in April 2012) and analyzed screenshots of the 261 resulting home pages and the readability of 193 home and first-level pages.

Results. Victims (94%) and donors (68%) were the primary intended audiences. About one half used social media and one third provided cues to action. Almost all (96.4%) of the Web pages were rated "fairly difficult" to "very confusing" to read, and 81.4% required more than a ninth-grade education to understand.

Conclusions. The service and marketing functions were met fairly well by the agency home pages, but usability (particularly readability and offer of a mobile version) and efforts to increase user safety could be improved. Internet technologies are an essential platform for public health. They are particularly useful for reaching people with stigmatized health conditions because of the anonymity allowed. The one third of agencies that lack a Web site will not reach the substantial portion of the population that uses the Internet to find health information and other resources. (*Am J Public Health.* 2014;104:702–707. doi:10.2105/AJPH.2013.301629)

of violence. In studying the content, we assessed whether the provided information addressed benefits, barriers, and other constructs of the widely used Health Belief Model,[18] which are of particular relevance to such victims because they potentially provide a "preferred path of action."[19]

METHODS

To obtain a representative sample, we drew a 10% systematic random sample of the organizations and programs listed in the most recent version of 2 national directories: the *National Directory of Domestic Violence Programs*,[20] which lists 1999 domestic violence programs, and the *Directory of Sexual Assault Centers in the United States*,[21] which lists 1805 sexual assault centers and tribal coalitions. We picked a random number between 1 and 10 to serve as the starting point in each directory and thereafter selected every 10th organization. We entered the name of each of the resulting 382 organizations into the Google search engine, which is the search engine of

choice of 83% of online searchers[22] We deemed an organization to have no Web site when the search of its name yielded no matching link on the first 2 pages of the Google result. (Users tend to consider only the results on the first page or even focus on the first few hits that they can see without scrolling down the page.[23]) When the search for a local organization yielded a Web site belonging to its national parent organization (n = 4), we considered the local organization not to have a Web site.

We identified a total of 261 Web sites. Because many Web sites are edited regularly, and to ensure a fixed time frame (April 17–20, 2012), we took and analyzed a screenshot of each home page.

To examine the functions, emphases, and usability of each home page, we developed 3 sets of variables: (1) characteristics related to service and marketing functions; (2) content, based on the Health Belief Model, to assess perceived severity, susceptibility, benefits, barriers, and cues to action; and (3) usability, based on the Research-Based Web Design and

Usability Guidelines[24] and several usability studies[25-28] to document such features as navigability and interactivity. A draft of the codebook was sent to 2 domestic violence and 2 sexual assault organizations for comments; all responded, and modifications were made accordingly.

We randomly drew a set of 34 Web sites from the unselected organizations for use in training 2 coders. Three training sessions totaling 20 hours occurred during 2 weeks, after which the coders (authors R. S. and J. X.) double-coded 30 home pages randomly selected from the sample. All items reached a satisfactory level of agreement: simple agreement averaged 98% (range = 87%–100%) and the Cohen κ averaged 0.96 (range = 0.71–1.00).

In addition, we assessed the readability (i.e., the ease with which text can be read and understood) of the home and first-level subpages of a 10% random sample of the study sample. (First-level subpages are the pages that can be accessed by clicking the tabs on the home page navigation bar. When the navigation bar triggered a drawdown menu [i.e., was not clickable], the first item on the menu was clicked and data were collected about the resulting Web page.) This search yielded 193 Web pages that we assessed using an automated Web page readability tool.[29]

We categorized Web pages on the basis of their level and content: home page; about us; get help; knowledge; news, events; contact us; give help; and other, which consisted predominantly of content for educators, researchers, and policymakers. We assessed the readability of each Web page via the Gunning Fog Index[30] and the Flesch Reading Ease.[31] The Gunning Fog Index calculates the number of years of schooling needed to be able to understand the content; 7 to 8 is considered an ideal score. The Flesch Reading Ease yields a score from 0 to 100 (most to least difficult to understand); a score below 50 is considered difficult. In addition, we recorded the number of words on each Web page.

RESULTS

Of the 382 agencies sampled, Web sites were located for 261 (68.3%). Although drawn from 2 different program-specific directories, as shown in Table 1, the modal Web site was

TABLE 1—Services Provided According to Web Sites of 382 Agencies Serving Abused and Assaulted Women, by Directory Type: United States; April 17–20, 2012

Apparent Service	Directory Type, %		
	Domestic Violence (n = 200)	Sexual Assault (n = 182)	Total, % (n = 382)
No Web site	29	35	32
Both domestic violence and sexual assault	33	40	36
Domestic violence only	33	3	19
Sexual assault only	1	14	7
Other	5	9	7

Source. The sample was drawn from the *National Directory of Domestic Violence Programs*[20] and the *Directory of Sexual Assault Centers in the United States.*[21]

devoted to both types of services (i.e., domestic violence services and sexual assault services), suggesting that the distinction between the 2 types of agencies is not clear-cut, at least not in their online presence. Given the overlap and the lack of substantive differences in preliminary analyses, we analyzed the Web sites as 1 group.

The vast majority (94%) of the home pages were directed toward victims, with all serving women (Table 2). Some subpopulations of victims were given special attention. For example, children were named on 54%, male victims on 15%, and members of the lesbian, gay, bisexual, transgender, and questioning community on 8% of the home pages. Donors were the second most common intended audience (68%), followed by potential workers (62%), educators and researchers (33%), and allies for change (e.g., families and friends; 30%). Services were a prominent feature of the home pages (82%) and ranged from shelter (44%) to court and hospital accompaniment (9%).

Marketing functions also were prominent, being noted on 99% of the home pages. We observed branding efforts on 94% of the home pages and announcements on 81%, most often about agency events (67%) and agency news (26%). Only one quarter of the home pages acknowledged the agencies' funders or funding sources, and only 1% had a link to a funder's Web site. More than two thirds had a donation button or provided a wish list of resources they wanted to have donated.

The concept of benefit—that is, the benefit of visiting the agency's Web site or using their services—was noted on more than half (52%) of the home pages (data not tabled). Primary

and secondary prevention were featured more often than rehabilitation (39% and 25% vs 19%). Potential barriers to taking action included individual- and agency-level considerations: 16% noted that Internet use can be monitored by an abuser and 1% mentioned agency funding problems. Concepts from the Health Belief Model framework, in addition to benefits and barriers, included severity (operationalized as harm associated with violence), which we observed on 21% of the home pages, with physical harm and emotional stress each mentioned on 10%; death, sexual harm, and isolation each mentioned on 8%; and economic loss noted on 4%. About one fifth (21%) included content emphasizing susceptibility—that is, the likelihood of experiencing sexual assault or domestic violence—with 15% conveying risk via statistical information and 7% via a factual example. One third (33%) included cues to action, defined as a stimulus necessary to trigger the decision-making process. The modal cue to action was a general encouragement to take action (25%). A few used a risk calculation survey (8%) or listed signs of high risk (5%) to encourage immediate action taking.

The first usability factor we examined was language (Table 3). All but 1 home page displayed information in English; 23% had a Spanish-language version. In addition, 6% had a translation button that enabled users to view the page in any language supported by the translation engine (usually Google Translate). These options are important given the language diversity of the United States.

Although a navigation bar was nearly universal (95%), other common Web site

TABLE 2—Intended Audience, Service, and Marketing Characteristics of Web Site Home Pages of 261 Agencies Serving Abused and Assaulted Women: United States; April 17–20, 2012

Characteristic	%
Intended audience	
Victims and survivors	94
Women	94
Children	54
Elderly	11
Men	15
Other[a]	14
Donors	68
Potential workers	62
Employees	30
Volunteers	49
Educators and researchers	33
Allies for change[b]	30
Policymakers	18
Potential abusers	6
Services	
Shelter	44
Knowledge	36
Legal advice	33
Counseling	31
Safety tips or plan	22
Prevention education	20
Financial assistance	10
Accompaniment	9
Marketing	
Credentialing	94
Logo	80
Mission statement	79
Announcements	81
Agency events	67
News[c]	66
Funder acknowledgment	26
Donations	
Donate button	65
Needed resources list	18

[a]Lesbian, gay, bisexual, transgender, and questioning: 8%; African Americans: 7%; Hispanics: 6%; immigrants: 6%; military affiliates: 2%.
[b]Family and friends, for example.
[c]Agency news (26%) and general news (14%).

TABLE 3—Usability Characteristics of Web Sites of 261 Agencies Serving Abused and Assaulted Women: United States; April 17–20, 2012

Category	%
Language	
English	100
Spanish	23
Translation button[a]	6
Navigation	
Navigation bar	95
Site map	15
Search mechanism	24
Internal hyperlink(s)	18
External hyperlink(s)	21
Escape button	32
Display	
Multimedia	80
Photographs	77
Video	12
Changeable display	3
Mobile version	1
Interactivity[b]	
Contact information	98
Telephone number[c]	87
Contact-us button	70
E-mail address	30
Fax number	25
Social media	53
Facebook	47
Twitter	23
E-mail list	21
Other[d]	17
Social tools[e]	7
Online (real-time) chat support	3
Leave-comment option	3

[a]Enables users to view content in another language.
[b]Interaction tools to communicate with agency staff, viewers, etc.
[c]Hotline number: 68%; main line: 23%; TTY/TDD (teletypewriter/telecommunications device for the deaf): 9%.
[d]Blog: 9%; YouTube: 8%; Flicker: 2%; Google Plus: 2%.
[e]Rich Site Summary (RSS) feed: 7%; Web badges: 0%; Web widgets: 0%.

navigation tools were far less common. A search mechanism was available on fewer than one quarter of the home pages, and a site map was available on fewer than one sixth.

The use of multimedia was common (80%) and included photographs (77%) and, to a lesser extent, video (12%). Only 3% of the home pages offered a changeable display (i.e., the font, font size, etc. can be changed by

the viewer), with 1% offering a mobile version. A static format has implications, addressed in the Discussion section, for usability by visually impaired persons and those who access the Web site from a mobile device.

One third of the home pages offered an escape button—that is, a quick exit option. With 1 click, the escape button redirects the user to a different Web site (usually google.com), and thus provides protection for victims who do not want others to know they are visiting a domestic violence or sexual assault Web site.

The telephone seems to be agencies' preferred method of being contacted given that many provided phone numbers, sometimes multiple phone numbers; however, 13% did not provide any phone number on their home page. A hotline or emergency number was listed on more than two thirds of the home pages, of which nearly three fourths were described as being available 24 hours a day, 7 days a week, and one fourth were explicitly described as toll-free. About 1 in 10 of the Web sites provided a TTY/TDD (text telephone for the deaf) number to serve hearing-impaired individuals.

About half made use of social media, with Facebook being the most mentioned. Nearly half of the Web sites pointed viewers to their Facebook page and encouraged them to become a fan of the agency. The use of social tools (Rich Site Summary [RSS] feeds) and online help mechanisms was far less common (7% and 3%, respectively).

We assessed the word count and readability of 193 Web pages (26 home pages and 167 first-level subpages). As shown in Table 4, some Web pages were brief (e.g., "contact us" pages) whereas others were long (e.g., pages for "frequently asked questions"). The number of words per page ranged from 25 to 5147, with a mean of 502 (SD = 518.79). Using multivariate analysis of variance, we documented few statistical differences by type of Web page; substantively, the types differed little in word count and readability.

The individual Web pages were difficult to read (data not shown). Almost all (96.4%) of the Web pages were in the "fairly difficult" to "very confusing" range as assessed by the Flesch Reading Ease scale. None were "standard" and only 3.6% were "easy." In addition, 81.4% of the 193 Web pages

TABLE 4—Number of Words in and Readability of 193 Web Pages of Agencies Serving Abused and Assaulted Women, by Content Type: United States; April 17–20, 2012

Web Page Type	No. of Words, Mean (SD)	Reading Ease[a]	Education Required, Years
Contact us (n = 15)	256.0 (212.4)	50.3	9.6
News, events (n = 22)	556.8 (1134.5)	47.0	9.9
Knowledge (n = 46)	613.0 (513.8)	47.8	10.3
Home page (n = 26)	510.6 (307.9)	46.4	10.6
Give help (n = 25)	468.5 (285.1)	46.3	10.6
Get help (n = 24)	575.5 (412.0)	49.0	11.0
About us (n = 19)	458.1 (264.2)	46.7	11.5
Other (n = 16)	313.9 (153.0)	41.1	11.6
Total	501.6 (518.8)	47.0	10.6

[a]30–50 = difficult.

required 9 or more years of schooling to be able to understand the content.

DISCUSSION

Like many underresourced public health efforts, domestic violence programs and sexual assault service agencies often lack sufficient funding to deliver services in the most accessible way.[12,13] In this context, Internet technologies provide one promising solution to meet both agency and population needs.

Organizations use Web sites to provide information on available services and to enhance agency visibility. Although these underlying principles overlap in practice, we describe them here as 2 distinct functions.

Service

Information about services predominated on the home pages. Nearly every home page was oriented toward victims, and many agencies listed who they serve, what services they provide, and how to reach the agency, typically via a hotline. Aside from telephone numbers, two thirds of the home pages did not include any cues to action. As with health cautions (e.g., "Seek immediate medical attention if you are experiencing any of the following symptoms…"), instructions urging action may be of use, albeit perhaps controversial in a field serving women who have experienced controlling behavior on the part of the abuser. Some cues to action included supportive statements (e.g., "If you or anyone you know is in

need of our services, please contact us immediately. We can help."), which may temper the directive nature of the cue.

Many Web sites in a variety of domains invite users' online interaction, some of which precludes user anonymity. Our findings indicate that almost two thirds of the home pages offered interaction tools, usually social media, by which viewers could share information, communicate with organization staff, or start a conversation with other viewers. Buttons for online help or to leave a comment were rare; 97% did not have such options. As Web site interactivity becomes commonplace, agencies need to adapt their Web sites and services to stay current.

Content related to severity and susceptibility was less salient, which might be appropriate if victims are the intended audience; they already know about and have experienced the violence. But some, including current and potential victims as well as the general public, may have limited knowledge about risk. Such knowledge is especially important for primary prevention because those who are aware of severity and susceptibility may be more likely to consider domestic violence and sexual assault to be issues of personal relevance. In other words, the home pages must address a spectrum of persons—those who are just browsing, those who are contemplating action, and those who are ready to take action.[32]

However, regardless of whether a Web site user is simply gathering information or is seeking immediate services, Internet use can be

monitored by others (i.e., abusers). Reminders of the possibility were uncommon. About one third of the home pages had an "Escape" or "Quick Exit" button, but many provided it without any rationale. Both an escape button and a warning that online use can be monitored by abusers—and perhaps explicit instructions about how to delete one's search history—should be displayed prominently on the home page. Concerns about batterers' use of the Internet and wireless technologies to control and harass their partners were raised in 2002 by a long-established leader in innovative violence-related education, research, and Internet publishing[33] and expanded upon by others.[34] Unfortunately, the concerns remain largely unaddressed by agencies more than a decade later.

Agencies that do not have a Web site, which constituted one third of our sample, may be so underresourced that they lack the ability to mount and maintain a Web site or to respond to the additional service requests that an online presence might generate. Alternatively, they may believe that the risks associated with the Internet are too great. The primary risk, as we see it, however, is that agencies without Web sites will become irrelevant, particularly to young people, who have the highest risk of sexual assault and intimate partner violence.[11]

Marketing

Web sites also serve a marketing function, which usually carries a goal of fund-raising, brand building, soliciting volunteers and resources, and building loyalty to the organization. Marketing is an important function for the establishment and maintenance of a successful agency.

Our findings indicate that agencies serving abused and assaulted women are aware of and promote the marketing function of their Web sites. More than two thirds of the Web sites included content related to donors and, by including a donate button, made it easy for potential donors to take action. Some also included a wish list—that is, a list of specific items, goods, or services that would benefit the agency.

However, some improvements could be made for better serving the marketing function. Posting more information about severity and susceptibility on home pages may attract more donations. Moreover, social media could

increase the visibility of the organization or attract more donations.

In addition, credibility is compromised when, as was the case with one fifth of the home pages, agencies do not display a logo or provide a mission statement. Providing a clear logo and mission statement on the home pages is a matter not only of brand building but of public trust, which, in turn, can affect donations that can help the agency fulfill its mission.

Usability

The desktop computer is fast becoming obsolete for Internet users, many of whom use a mobile device to access the Internet.[35,36] More than half use a cellphone to access the Internet,[37] which has substantially narrowed the digital divide.[38] In addition, mobile devices may be perceived as more intimate than personal computers. However, Web sites designed for viewing on a desktop computer do not necessarily lend themselves to viewing on a mobile device. Small text, difficulty viewing and accessing multimedia components, a distorted template and structure, and substantial download time often result. Such inconveniences can be discouraging, which runs counter to the purpose of having material online. A home page is the logical place to post information about the availability of a mobile version, but 99% of the agency home pages reviewed did not include such information. That does not necessarily mean that an agency does not have a mobile version, but home pages do not bring such information to the attention of users. This is important because the trend is toward smartphones—smartphone shipments surpassed personal computer shipments in the fourth quarter of 2010[39]—and agencies are encouraged to provide a mobile version of their Web site to enhance usability.

The Web sites were built for educated users. On average, viewers need to have 10 to 11 years of education to be able to understand the Web sites, which is comparable to the readability level of *Time*, *Newsweek*, or the *Wall Street Journal* and substantially higher than the ideal score (7–8 years). Web sites serve a large range of audiences, so it is understandable that some content (e.g., the research page, which may be of interest to educators and

policymakers) is harder to read. However, to reach those with limited literacy skills as well as well-educated viewers, Web pages that are clearly focused on serving victims (e.g., the "get help" page) should be easy to understand. To be more specific, agencies are encouraged to use short sentences and words with fewer than 3 syllables to maximize the readability of victim-oriented content.

The Web sites also were built for those who speak English. Although about 1 in 20 home pages provided a translation button, more than 1 in 5 persons in the United States speak a language other than English at home.[40] Agencies can easily and inexpensively expand the number and kind of people they reach by connecting viewers to free and widely available online translation engines. This action is particularly important for agencies in linguistically diverse locales and those that provide services in multiple languages.

Finally, agencies may want to give consideration to the search terms that are used to reach their Web sites and online social networks. This is necessary because online communication requires active information seeking. For example, a Google search on the word "rape" yielded more than 196 000 000 results. Among the 13 search results on the first page of results, only 4 were organizations or networks that serve victims. Other results included Wikipedia's and others' definitions of rape as well as YouTube postings of gang rapes. These results may distress someone who is seeking services for an assault. A search on "rape crisis" yielded a much higher percentage of service agencies; however, it is not clear whether users would include "crisis" in their initial searches. As a result, agencies serving abused and assaulted women should determine how to increase their rank and presence in online searches. A better understanding of the actual (vs assumed) search terms will help all agencies to enhance their online presence.

Future Research

The present investigation, among the first to systematically describe the Web sites of domestic violence and sexual assault organizations, has certain limitations. The content analysis captured information presented on home pages, but additional information may

be posted on pages "deeper" in the Web site. This can be seen as a limitation of our research in that analysis of all pages may have yielded more complete information about an agency, or as a limitation of the Web site designs in that users could not tell from the home page who the agency serves.

We chose to code the Web sites by hand, in part because this study is, to our knowledge, the first content analysis of the Web sites of agencies serving abused and assaulted women, and we wanted to develop firsthand knowledge of the content structure. Future content analysis research may benefit from the use of automated (i.e., computer-assisted) coding because it is a relatively low-cost way to analyze large samples of Web pages. Future research also may want to consider checking whether the links provided on the pages actually work; broken Web links can inadvertently discourage a viewer. The present study described how agencies present themselves on the Internet. A logical next step is investigation into the use of the Web sites,[41] which we are beginning.

Conclusions

The Internet has become an essential component in the navigation of everyday life. Web sites and social networking services have changed the way people obtain information and how they connect with one another. In creating a systematic depiction of the Internet presence and online information quality of US domestic violence and sexual assault organizations, we learned that one third of the agencies do not have a Web site and that the usability of the existing Web sites can be improved in several ways. For these and other public health–oriented agencies to stay relevant, online information accessibility is essential. ∎

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This article was accepted August 18, 2013.

Human Participant Protection

The research was deemed exempt from institutional review board approval because human participants were not studied.

References

1. Pew Research Center's Internet & American Life Project. Demographics of Internet users, August 2012 survey. Available at: http://pewinternet.org/Static-Pages/Trend-Data-(Adults)/Whos-Online.aspx. Accessed September 9, 2012.

2. Lenhart A, Madden M, Smith A, Purcell K, Zickuhr K, Rainie L. *Teens, Kindness and Cruelty on Social Network Sites*. Washington, DC: Pew Research Center's Internet & American Life Project; November 9, 2011.

3. Smith A. *Why Americans Use Social Media*. Washington, DC: Pew Research Center's Internet & American Life Project; November 15, 2011.

4. Borzekowski DLG, Schenk S, Wilson JL, Peebles R. e-Ana and e-Mia: a content analysis of pro–eating disorder Web sites. *Am J Public Health*. 2010;100(8):1526–1534.

5. Ford EW, Huerta TR, Schilhavy RAM, Menachemi N. Effective US health system websites: establishing benchmarks and standards for effective consumer engagement. *J Healthc Manag*. 2012;57(1):47–64.

6. Friedman DB, Koskan A, Rose ID. Prostate cancer guidelines on Web 2.0-based sites: the screening dilemma continues online. *J Cancer Educ*. 2011;26(1):188–193.

7. Horvath KJ, Harwood EM, Courtenay-Quirk C, et al. Online resources for persons recently diagnosed with HIV/AIDS: an analysis of HIV-related webpages. *J Health Commun*. 2010;15(5):516–531.

8. Lingas EO, Dorfman L, Bukofzer E. Nutrition content of food and beverage products on Web sites popular with children. *Am J Public Health*. 2009;99(suppl 3):S587–S592.

9. Whiteley LB, Mello J, Hunt O, Brown LK. A review of sexual health Web sites for adolescents. *Clin Pediatr*. 2012;51(3):209–213.

10. Berger M, Wagner TH, Baker LC. Internet use and stigmatized illness. *Soc Sci Med*. 2005;61(8):1821–1827.

11. Black MC, Basile KC, Breiding MJ, et al. *The National Intimate Partner and Sexual Violence Survey (NISVS): 2010 Summary Report*. Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention; 2011.

12. Finn J. Domestic violence organizations on the Web: a new arena for domestic violence services. *Violence Against Women*. 2000;6(1):80–102.

13. Finn J. A survey of domestic violence organizations on the World Wide Web. *J Technol Hum Serv*. 2000;17(1):83–102.

14. Finn J, Garner MD, Wilson J. Volunteer and user evaluation of the National Sexual Assault Online Hotline. *Eval Program Plann*. 2011;34(3):266–272.

15. Finn J, Hughes P. Evaluation of the RAINN National Sexual Assault Online Hotline. *J Technol Hum Serv*. 2008;26(2–4):203–222.

16. Kranz AL. Changing practice: how domestic violence advocates use Internet and wireless communication technologies. Minnesota Center Against Violence and Abuse. 2002. Available at: http://www.mincava.umn.edu/documents/2casestudies/2casestudies.html. Accessed July 10, 2012.

17. Westbrook L. Crisis information concerns: information needs of domestic violence survivors. *Inf Process Manage*. 2009;45(1):98–114.

18. Rosenstock IM. The Health Belief Model and preventive health behavior. *Health Educ Monogr*. 1974;2(4):354–386.

19. Rosenstock IM. Historical origins of the Health Belief Model. *Health Educ Monogr*. 1974;2(4):328–335.

20. *National Directory of Domestic Violence Programs*. Denver, CO: National Coalition Against Domestic Violence; 2008.

21. *Directory of Sexual Assault Centers in the United States*. Enola, PA: National Sexual Violence Resource Center; 2008.

22. Purcell K, Brenner J. Rainie L. *Search Engine Use 2012*. Washington, DC: Pew Research Center's Internet & American Life Project; March 9, 2012.

23. Lewandowski D. Search engine user behaviour: how can users be guided to quality content? *Inf Serv Use*. 2008;28(3–4):261–268.

24. *The Research-Based Web Design & Usability Guidelines, Enlarged/Expanded Edition*. Washington, DC: US Dept of Health and Human Services; 2006.

25. Hinchliffe A, Mummery WK. Applying usability testing techniques to improve a health promotion website. *Health Promot J Austr*. 2008;19(1):29–35.

26. Lee Y, Kozar KA. Understanding of website usability: specifying and measuring constructs and their relationships. *Decis Support Syst*. 2012;52(2):450–463.

27. Nielsen J. Top ten guidelines for homepage usability. May 12, 2002. Available at: http://www.useit.com/alertbox/20020512.html. Accessed August 2, 2012.

28. Nielsen J, Tahir M. Homepage usability: 50 websites deconstructed. *Online Inf Rev*. 2003;27(4):293–294.

29. Juicy Studio. Readability test. Available at: http://juicystudio.com/services/readability.php#readingresults. Accessed September 12, 2012.

30. Gunning R. *The Technique of Clear Writing*. New York, NY: McGraw-Hill; 1952.

31. Flesch R. A new readability yardstick. *J Appl Psychol*. 1948;32(3):221–233.

32. Burke JG, Denison JA, Gielen AC, McDonnell KA, O'Campo P. Ending intimate partner violence: an application of the transtheoretical model. *Am J Health Behav*. 2004;28(2):122–133.

33. Kranz AL, Nakamura K. Helpful or harmful? How innovative communication technology affects survivors of intimate violence. Minnesota Center Against Violence and Abuse. May 8, 2002. Available at: http://www.mincava.umn.edu/documents/5survivortech/5survivortech.html. Accessed July 10, 2012.

34. Southworth C, Finn J, Dawson S, Fraser C, Tucker S. Intimate partner violence, technology, and stalking. *Violence Against Women*. 2007;13(8):842–856.

35. Smith A. *Mobile Access 2010*. Washington, DC: Pew Research Center's Internet & American Life Project; July 20, 2010.

36. Rainie L, Fox S. *Just-in-Time Information Through Mobile Connections*. Washington, DC: Pew Research Center's Internet & American Life Project; November 9, 2011.

37. Smith A. *Cell Internet Use 2012*. Washington, DC: Pew Research Center's Internet & American Life Project; June 26, 2012.

38. Zickuhr K, Smith A. *Digital Differences*. Washington, DC: Pew Research Center's Internet & American Life Project; April 13, 2012.

39. Albanesius C. Smartphone shipments surpass PC shipments for first time. What's next? *PC Magazine*. February 8, 2011. Available at: http://www.pcmag.com/article2/0,2817,2379665,00.asp. Accessed September 22, 2012.

40. US Census Bureau. State and County QuickFacts. Available at: http://quickfacts.census.gov/qfd/states/00000.html. Accessed September 19, 2012.

41. Weaver JB, Mays D, Weaver SS, Hopkins GL, Eroglu D, Bernhardt JM. Health information-seeking behaviors, health indicators, and health risks. *Am J Public Health*. 2010;100(8):1520–1525.