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Use and Perceived Credibility of Medication Information Sources for Patients with a Rare Illness: Differences by Gender

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Abstract

Patients with rare illnesses may use medication information sources that are appreciably different from those used by patients with more common illnesses. This article's purpose is to describe vasculitis patients' most frequently used medication information sources, determine which sources patients perceive as credible, and explore gender differences in source use and perceived credibility. Using an online questionnaire, patients ($n=232$) indicated how often they obtained medication information from 12 sources during the previous year and rated the credibility of 6 sources. The authors used multivariate analysis of covariance and follow-up contrasts to test for gender differences in source use and conducted t tests to compare patients' perceived credibility ratings. Patients used physicians and the Internet most often to obtain medication information and rated them as the most credible sources. Male patients used their spouse/partner more often and rated them as more credible than did female patients. Female patients were more likely to use medication package inserts and the Internet and were less likely to use nurses than were male patients. There appear to be similarities and differences between the information-seeking behaviors of vasculitis patients and other patient populations. Because male patients view their spouse/partner as a credible information source, providers may want to involve the spouse/partner in prescription decision making.

The availability of medication information has increased dramatically over the past few decades. This increase is due to a number of factors, including the growth of health-related

Web sites on the Internet (Cline & Haynes, 2001; Fox & Rainie, 2000), direct-to-consumer drug advertisements (Khanfar, Loudon, & Sicar-Ramsewak, 2007), policy changes to improve medication package inserts (Amery, 1999), and increased patient advocacy and consumerism (Dutta-Bergman, 2005). Given the growing number of information sources, the variability in quality across sources (Berland et al., 2001; Thompson & Graydon, 2009), and the relation between information and positive patient outcomes (Rutten, Arora, Bakos, Aziz, & Rowland, 2005), it is important to understand where patients obtain information about their medications.

Patients generally obtain health information from multiple sources, although physicians are generally ranked as one of the most preferred and trusted sources (Hesse et al., 2005; Mayer et al., 2007; Narhi, 2007; Rutten et al., 2005; Trewin & Veitch, 2003). Even though physicians are often preferred, they are not necessarily the most frequently used source. For example, studies have found that patients consulted the Internet (Hesse et al.), information leaflets (Narhi), and pharmacists (Sleath, Wurst, & Lowery, 2003) more often than physicians. Other frequently consulted health information sources include books (Hesse et al.) and newsletters (Huber & Cruz, 2000), nurses (Luker, Beaver, Leinster, & Owens, 1996; Mills & Davidson, 2002; Rutten et al.), and mass media sources such as newspapers, magazines, and television (Cunningham, Davidson, Nakazono, & Andersen, 1999; Huber & Cruz; Narhi; Rutten et al.). Family and friends also are important sources of health information for patients (Huber & Cruz; Rutten et al.; Sleath et al.).

Many factors, including gender, can affect patients' information-seeking behavior. Female patients have consistently sought information more frequently and from more sources than have male patients (Mayer et al., 2007; Rutten et al., 2005; Huber & Cruz, 2000). Additional factors, including age (Hesse et al., 2005; Narhi, 2007; Rutten et al.; Sleath et al., 2003), education (Mayer et al.; Rutten et al.), race (Cunningham et al., 1999; Rutten et al.; Williams, Anstrom, Friedman, & Schulman, 2007), and phase of illness (Rutten et al.) can also influence patients' information-seeking behavior. To be specific, younger people and those with higher levels of education tend to seek more information than older people and those with lower levels of education (Mayer et al.; Rutten et al.), whereas the effect of race has been inconsistent (Cunningham et al.; Williams et al.). Source preference also varies with phase of illness; patients prefer written materials in the early stages of their disease, whereas family and friends become more important sources as the disease progresses (Rutten et al.).

Most of the aforementioned findings are from samples of cancer patients and assess general rather than medication-specific information-seeking behaviors. Although not tested empirically, it is reasonable to assume that information source use is not identical across different patient groups, especially for patients living with a rare illness. Vasculitis patients represent one such group; the prevalence of anti-neutrophil cytoplasmic antibodies–associated granulomatosis vasculitis (Woywodt & Matteson, 2006), the most common form of vasculitis, is 30 cases/million U.S. citizens (Cotch et al., 1996).

Vasculitis causes blood vessel inflammation and is characterized by an unpredictable course of relapses and remission. Medications are critical for patient survival because they induce remission in patients experiencing relapses as well as prevent subsequent relapses once remission is achieved. Treatment with vasculitis medications improves the 5-year survival rate between 70 and 90%; however, approximately 20% of patients do not respond to treatment and 50% of responders will subsequently experience a relapse (Walsh & Jayne, 2007). Patients experiencing a relapse are typically prescribed a combination of immunosuppressive medications and cytotoxic agents to control inflammation and prevent organ damage. After achieving remission, many patients are prescribed maintenance therapy

drugs, such as immunosuppressive medications and antibiotics, which reduce the rate of subsequent relapses (Puechal, 2007). Sometimes patients stop taking medications completely after a 6–12-month maintenance period, whereas others have to remain on maintenance medications for the rest of their lives. Although induction of remission and additional years of life are major benefits of vasculitis medications, medical treatment also carries certain burdens, including serious medication side effects, loss of income as a result of missed days of work, alteration of routine, and constant symptom monitoring (Hoffman et al., 1998).

Although vasculitis patients may be just as motivated to obtain medication information as patients with more common illnesses, these patients do not have access to the same types of information sources. For example, it is unusual to hear vasculitis discussed on television. Moreover, popular print media sources, such as newspapers and magazines, do not publish articles about vasculitis with nearly the same frequency as articles about more common diseases. Partially because of vasculitis' lack of exposure in the media, the general public's awareness of the disease is low. For this reason, family and friends, which cancer (Rutten et al., 2005) and HIV patients (Huber & Cruz, 2000) commonly use for disease-related information, are unlikely to have valuable vasculitis-specific information to share, unless they search for this information themselves.

Because the medication information sources used by patients with a rare illness may be appreciably different from other disease groups, the primary goal of this article is to describe vasculitis patients' most commonly used sources of medication information and determine which sources patients perceive as most credible. A secondary goal is to investigate whether there are gender differences in source use and perceived credibility of information sources. Specifically, patients' use of 12 sources, including physicians, pharmacists, nurses, brochures and pamphlets, medicine package inserts, articles and books, the Internet, vasculitis support groups, spouse/ partner, family members, friends, and patient newsletters, are explored.

Methods

All data were collected as part of the Accessing Social Support in Symptom Treatment (ASSIST) Study, which assessed the information-seeking behaviors of vasculitis patients. The ASSIST Study consisted of two online questionnaires administered 3 months apart. To be eligible for participation, patients must have a self-reported diagnosis of vasculitis, be at least 18 years of age, be able to read and write in English, have access to the Internet, and currently be taking at least one vasculitis medication. This study was approved by the Institutional Review Board at the University of North Carolina at Chapel Hill.

We recruited participants for the ASSIST Study in four ways. We distributed study brochures at a vasculitis patient conference, which yielded 45 interested patients, 39 of whom were eligible. In addition, we mailed study announcement letters to known vasculitis patients ($n = 361$) who were part of the Glomerular Disease Collaborative Network, which is a collaboration of the University of North Carolina and community nephrology offices across the southeastern United States. Of the 67 Glomerular Disease Collaborative Network patients who returned correspondence, 38 were eligible to participate. For our third recruitment method, we contacted physician-diagnosed vasculitis patients ($n = 124$) who were part of two studies at the Thurston Arthritis Research Center; 29 of the 39 (74%) patients who responded were eligible and interested. Our final method involved posting general announcements (including a study podcast) on vasculitis Web sites and in patient newsletters. Information about the study was also distributed at local support group meetings

and circulated on eight vasculitis e-mail groups and list-servs; 147 of the 155 patients who contacted us in response to these general announcements were eligible.

Thus, 306 patients, 253 (83%) of whom were eligible and interested, responded to our various recruitment efforts. Reasons for ineligibility included not taking vasculitis medications ($n = 25$), patient death ($n = 9$), not having access to the Internet ($n = 9$), being too busy to participate ($n = 4$) and not having a diagnosis of vasculitis ($n = 1$). An additional 5 patients refused to participate after learning more about the study.

Measures

All study measures described below were completed as part of the ASSIST baseline questionnaire.

Sociodemographics—Before completing main study measures, participants answered various demographic and disease-related questions, including one item each about gender, race, age, education (in years), year of diagnosis, vasculitis type (Wegener's granulomatosis, microscopic polyangiitis, Churg Strauss syndrome, Takayasu arteritis, other), phase of illness (currently experiencing relapse/flare vs. not currently experiencing relapse/ flare), and health insurance status (insured versus not insured). A disease duration variable was created by subtracting the year in which the patient was diagnosed with vasculitis from the midpoint of our data collection year (2008.5). In addition, participants indicated whether they lived within or outside the United States (U.S., international).

Frequency of Medication Source Use—We asked patients how often they obtained vasculitis medicine information from 12 sources, including physicians, pharmacists, nurses, brochures and pamphlets, medicine package inserts, articles and books, Internet (information Web sites), support groups (online or in-person), spouse/partner, family members other than their spouse, friends, and newsletters. For each source, patients answered one item about how often they had obtained vasculitis medicine information during the past year, reporting on a 5-point scale ranging from 1 (*never*) to 5 (*always*).

Source Credibility—To limit respondent burden, we focused our assessment of source credibility on six sources that have influenced patient medication adherence in previous studies (Gallant, 2003; Meredith, Jeffe, Mundy, & Fraser, 2001; O'Brien, Petrie, & Raeburn, 1992), including the Internet, physicians, pharmacists, spouse/partners, family members/friends, and other vasculitis patients. Specifically, if patients reported that they had obtained information about vasculitis medicines from any one of six sources, then they were asked to rate the perceived credibility of that source. Hence, if patients did not report obtaining vasculitis medication information from the pharmacist, for example, they did not complete perceived credibility items about the pharmacist. Credibility was measured by two items that were derived from the McCroskey and Teven Credibility Scale (McCroskey & Teven, 1999). The first item asked how knowledgeable a source was about vasculitis medicines, reported on a 9-point scale ranging from 1 (*not at all knowledgeable*) to 9 (*extremely knowledgeable*); the second item asked how expert the source was about vasculitis medicines, reported on a 9-point scale ranging from 1 (*not at all expert*) to 9 (*extremely expert*). Interitem correlations ranged from .92 for family credibility to .81 for Internet credibility. A summary score was created for each source by averaging the two items.

Data Analysis—We used SAS (Version 9.2) to generate univariate statistics (means, standard deviations) to characterize the sample. We then calculated descriptive statistics for male and female patients on the key study variables (frequency of source use, perceived credibility). To determine whether there were differences in how often men and women used

medication information sources during the past year, we ran a multivariate analysis of covariance model using PROC MIXED to determine whether there was a significant source by gender interaction. In this analysis, subject (participant) was treated as a random effect and information source and gender were treated as fixed effects. The 12 frequency-of-source-use variables were the dependent variables, information source (e.g., physician, pharmacist, spouse) and patient gender were treated as the primary independent variables and age, education, race (white vs. nonwhite), participant type (United States vs. international), self-defined vasculitis type, insurance status, phase of illness (relapse vs. remission) and disease duration were the control variables. If the Source \times Gender interaction term was significant ($p < .05$), we proceeded by contrasting men and women for each of the 12 information sources. To contrast men and women, we created a male and female category for each source, which resulted in 24 different categories. For example, physician (Source 1) was split into two categories (“g1 s1” and “g2 s1”) in which g1 referred to men, g2 referred to women, and s1 referred to Source 1. This procedure was repeated for each of the 12 sources; thus, our F tests for contrasts had 2,374 degrees of freedom and were considered significant if the p value was less than .01.

For our perceived credibility analyses, we used independent sample t -tests to compare men and women's ratings of six sources: doctors, pharmacists, spouses, family members, other vasculitis patients, and the Internet. We applied the Bonferroni correction to our results; thus, individual t -tests were only considered significant if $p < .008$ (i.e., $.05/6$).

Results

Sample Characteristics

Twenty-one patients did not complete the baseline questionnaire. Reasons for non-completion included technical issues ($n = 7$), being too sick ($n = 4$) or too busy ($n = 3$) to participate, or never responding to study correspondence ($n = 7$). Thus, 232 of 253 eligible patients (92%) completed the questionnaire. When compared with completers, noncompleters were not significantly different in terms of gender or vasculitis type; we did not have any additional variables with which to compare completers and noncompleters.

Table 1 summarizes the demographic and clinical characteristics of male and female study participants. A majority of participants were female (69%), White (91%), in a committed relationship (81%) and had a diagnosis of anti-neutrophil cytoplasmic antibodies-associated granulomatous vasculitis (59%). On average, participants were middle-aged ($M = 50.96$, $SD = 13.51$) and reported some college education ($M = 15.58$, $SD = 2.87$). Forty-eight (21%) participants resided outside the United States. Patients had been living with vasculitis for an average of 6.5 years, and 27.6% were currently experiencing a relapse or flare. Of patients, 94% reported having health insurance. Differences between male and female participants are noted in Table 1.

Sources of Medication Information

During the past year, physicians were the most frequently used medication information source for both male and female patients, whereas the Internet was the second most used source (Figure 1). Patients also obtained medication information from medication package inserts, but they used other written materials such as books and articles, brochures and pamphlets, and newsletters less often. Support groups and nonphysician health professionals, such as nurses and pharmacists, were not used frequently during the past year by patients. Two of the least used sources were non-health professionals, such as family members other than the spouse and friends. The spouse/partner was the third most

frequently used source for men, but the absolute least used source for women. These differences are subsequently discussed in greater detail.

Gender Differences in Source Use

The Source \times Gender interaction term, $F(1, 2374) = 12.76, p < .0001$, was significant in the multivariate model, controlling for age, education, race, vasculitis type, international participant status, health insurance status, time since last relapse/flare, and disease duration. Besides a main effect for information source, $F(1, 2374) = 78.20, p < .0001$, there were no other significant variables in the model. Follow-up contrasts (Table 2) revealed that the largest gender difference was seen for the spouse/partner, with men using this source more often than women. Patients also differed in their use of the Internet, with women obtaining information from this source more often than men. The third largest gender difference in source use was seen for medication package inserts; women were more likely than men to obtain information from this source. Alternatively, men were more likely to obtain medication information from nurses than were women. We did not find any other significant gender differences in source utilization.

Perceived Credibility of Medication Information Sources

On a scale from 1 to 9, the two most credible sources for both male and female patients were physicians and the Internet (Figure 2). Although not rated as highly, pharmacists and other vasculitis patients were perceived as fairly credible information sources. Male patients rated family members as the least credible source, whereas female patients rated them as the second least credible source. Similar to our previous finding with the source frequency variable, there was a discrepancy between males and females in terms of how credible they viewed their spouse/partner, with men rating their partners as fairly credible, whereas women rated their partners as the least credible of the six sources.

Gender Differences in Source Credibility

The Bonferroni-corrected t test revealed that the gender difference in spouse/partner credibility was significant (Table 3). No other significant gender differences in source credibility were found, although the t test for other vasculitis patients trended toward significance. In this case, women rated other vasculitis patients as more credible sources than men did.

Discussion

To our knowledge, this is the first study to describe vasculitis patients' medication information-seeking behavior. Our results revealed that, in some ways, vasculitis patients possess source preferences and credibility ratings that are similar to those of other patient groups. For example, cancer patients, like vasculitis patients, sought information most often from health care providers and the Internet (Rutten et al., 2005), with physicians rated as their most trusted information source (Hesse et al., 2005). In addition, vasculitis patients' use of written materials, such as medication package inserts and books, mirrors that of other patient populations (Huber & Cruz, 2000; Rutten et al., 2005).

There may also be important differences in the types of sources that vasculitis patients consult when compared with other patient groups. For example, when compared with HIV (Huber & Cruz, 2000) and cancer patients (Rutten et al., 2005), vasculitis patients appear to use support groups more often and family and friends less often. Specifically, patients in our study ranked support groups as their fourth most frequently used source, whereas family and friends (other than the spouse) were ranked among the least used sources; other studies have found that family and friends are used more often than support groups (Huber & Cruz;

Rutten et al.). That vasculitis is a rare disease could partially explain this finding. Whereas a high percentage of people living in the United States probably know someone with cancer or have seen a story about an HIV-positive person, it is unlikely that they know someone living with vasculitis. In the absence of family and friends who are knowledgeable about the disease, patients may view vasculitis support groups as more reliable sources of medication information.

We found that vasculitis patients may underuse nonphysician health professionals such as nurses and pharmacists for medication information. Even though patients rated pharmacists as fairly credible information sources, they were only consulted rarely to sometimes during the past year. Nurses were consulted even less frequently, which makes sense given that most medical practices and hospitals do not have nurses specifically trained in vasculitis care. It is unclear whether patients did not use pharmacists and nurses because they obtained the medication information they needed from other sources, such as physicians and the Internet, or because there were access issues, whereby it was difficult to contact nurses or pharmacists. Future studies that are qualitative in nature may help elucidate why vasculitis patients did not consult nonphysician health professionals often for medication information.

We were surprised by the magnitude of the gender difference in how vasculitis patients view and use their spouse/partner as an information source. Male patients ranked their spouse/partner as their third most used and fourth most trusted source of medication information. In contrast, female patients ranked their spouse/partner as their least used (out of a list of 12 sources) and least credible (out of a list of 6 sources) source of information.

There are several possible explanations for the aforementioned finding. First, women seek more health information from more sources than men (Huber & Cruz, 2000; Mayer et al., 2007; Rutten et al., 2005). Hence, for women, the relative credibility of partners may decrease when compared with information from more objective sources such as pharmacists, written materials, and the Internet. Alternatively, gender roles and socialization may explain why male and female patients have dramatically different opinions of their spouse/partner as a source of medication information. In Western societies, women often take on a nurturing role, which may make them feel responsible for the health of their family members, including partners (Gabriel & Gardner, 1999). Hence, women may feel that it is their duty to research multiple aspects of their partner's disease, including its treatment. Alternatively, men are socialized to be strong and resistant to illness (Lee & Owens, 2002), which may make them less likely to seek medical services and information (Verbrugge, 1985). Because we did not ask participants to report their spouse/partner's gender, we cannot verify that all spouses of male patients were female. In addition, female participants were younger, more likely to be international participants, less likely to be married, and had been living with vasculitis for a shorter amount of time than male patients, although it is unlikely that these demographic differences were primarily responsible for our findings.

Medication package inserts, the Internet, and nurses represent three other sources that men and women used differently. Women consulted package inserts and the Internet more often than men did, whereas men were more likely than women to consult nurses. Again, we believe the fact that women search for information from more sources than men may explain why they used package inserts and the Internet more frequently. However, we do not have an explanation for why men seek health information from nurses more frequently than women. To reduce respondent burden, we did not ask participants to rate the perceived credibility of all 12 sources. It could be that men believe nurses are more credible sources of information than women do; thus, they consult them more often. Future studies should ask participants to rate the credibility of all sources to determine whether credibility is the driving force behind gender differences in source use.

None of the demographic and clinical variables that we included in our multivariate model had a significant effect on how often patients' consulted different information sources. The relative homogeneity of vasculitis samples (predominately White, middle-aged and well-educated) make it difficult to assess the effect of these potential moderating variables. Also, because we did not have many international participants ($n = 48$), we did not have sufficient power to detect inter-country differences in information seeking. Although phase of illness has been associated with information seeking in previous research (Rutten et al., 2005), our disease status variable was not a significant predictor in our sample.

Because we used an online survey to collect data, the results of our study, especially findings regarding the Internet, should not be generalized to the greater vasculitis population. It is likely that non-Internet users have markedly different opinions about the credibility of Internet sources. Researchers who are interested in non-Internet-using patients could use pen-and-paper surveys or telephone interviews to capture the information source preferences of this group. Our low response rate to our mailed recruitment efforts further limits our ability to generalize the study findings.

The baseline questionnaire asked participants to report their medication information source use during the past year. This retrospective examination of information seeking is a limitation of our study that is subject to recall bias. Longitudinal studies that examine patients' information-seeking behavior over the course of their illness are a logical next step, particularly because source use has been shown to change over time (Mills & Davidson, 2002; Rutten et al., 2005; Squiers, Rutten, Treiman, Bright, & Hesse, 2005). Moreover, our assertion that vasculitis patients differ from other patient groups is speculative at this point, especially because we are comparing results that are specific to medication information to more general studies of health information seeking. Additional research should recruit samples of patients with different diseases to determine whether disease type truly influences information source use and preference. A comparison of a common disease, such as arthritis or diabetes, with a rare disease, such as vasculitis, may be particularly enlightening.

Conclusions

As with other patient populations, vasculitis patients consult multiple sources for medication information. The number of sources that patients consult may be more limited when compared to a disease such as cancer, which makes the information provided by the physician particularly valuable to patients. In the eyes of patients, physicians are their most credible source of medication information. However, patients also rated the Internet as a very credible source. Because medication information on the Internet is not necessarily accurate or presented in a patient-friendly manner (Thompson & Graydon, 2009), physicians may want to direct their vasculitis patients to high-quality Web sites. Moreover, because the social networks of vasculitis patients are likely to be devoid of family and friends who are knowledgeable about vasculitis, physicians should consider referring patients to organizations such as the Vasculitis Foundation, which can help guide patients to online and local support groups.

Because male patients think of their spouse/partner as a trusted source of medication information, physicians should attempt to include male patients' partners in the disease-management process. Previous studies have found that partners undergo a pattern of information seeking that is comparable, if not more thorough, than that of the patient (Echlin & Rees, 2002). For this reason, it is particularly important that physicians and other health care professionals equip patients and their partners with accurate medication information.

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References

- Amery WK. Coming full circle in pharmacovigilance: Communicating safety information to patients through patient package inserts. *Pharmacoepidemiology and Drug Safety*. 1999; 8:121–129. [PubMed: 15073937]
- Berland GK, Elliott MN, Morales LS, Algazy JI, Kravitz RL, Broder MS, et al. Health information on the Internet: Accessibility, quality, and readability in English and Spanish. *JAMA*. 2001; 285:2612–2621. [PubMed: 11368735]
- Cline RJW, Haynes KM. Consumer health information seeking on the Internet: The state of the art. *Health Education Research*. 2001; 16:671–692. [PubMed: 11780707]
- Cotch MF, Hoffman GS, Yerg DE, Kaufman GI, Targonski P, Kaslow RA. The epidemiology of Wegener's granulomatosis. *Arthritis Rheumatism*. 1996; 39:87–92. [PubMed: 8546743]
- Cunningham WE, Davidson PL, Nakazono TT, Andersen RM. Do black and white adults use the same sources of information about AIDS prevention? *Health Education Behavior*. 1999; 26:703–713. [PubMed: 10533174]
- Dutta-Bergman MJ. Developing a profile of consumer intention to seek out additional information beyond a doctor: The role of communicative and motivation variables. *Health Communication*. 2005; 17:1–16. [PubMed: 15590339]
- Echlin KN, Rees CE. Information needs and information-seeking behaviors of men with prostate cancer and their partners: A review of the literature. *Cancer Nursing*. 2002; 25:35–41. [PubMed: 11838718]
- Fox, S.; Rainie, L. The on-line health care revolution: How the Web helps Americans take better care of themselves. 2000. Retrieved from <http://www.pewInternet.org/reports/toc.asp?Report=26>
- Gabriel S, Gardner WL. Are there “his” and “hers” types of interdependence? The implications of gender differences in collective versus relational interdependence for affect, behavior, and cognition. *Journal of Personality and Social Psychology*. 1999; 77:642–655. [PubMed: 10510513]
- Gallant MP. The influence of social support on chronic disease self-management: A review and directions for research. *Health Education Behavior*. 2003; 30:170–195. [PubMed: 12693522]
- Hesse BW, Nelson DE, Kreps GL, Croyle RT, Arora NK, Rimer BK, et al. Trust and sources of health information: The impact of the internet and its implications for health care providers: Findings from the first Health Information National Trends Survey. *Archives of Internal Medicine*. 2005; 165:2618–2624. [PubMed: 16344419]
- Hoffman GS, Drucker Y, Cotch MF, Locker GA, Easley K, Kwok K. Wegener's granulomatosis: Patient-reported effects of disease on health, function, and income. *Arthritis Rheumatism*. 1998; 41:2257–2262. [PubMed: 9870883]
- Huber JT, Cruz M. Information needs and information-seeking of HIV positive men and women. *Medical Reference Services Quarterly*. 2000; 19:39–48. [PubMed: 11299608]
- Khanfar N, Loudon D, Sircar-Ramsewak F. FDA direct-to-consumer advertising for prescription drugs: What are consumer preferences and response tendencies? *Health Marketing Quarterly*. 2007; 24:77–91. [PubMed: 19042521]
- Lee CE, Owens RG. Issues for a psychology of men's health. *Journal of Health Psychology*. 2002; 7:209–217. [PubMed: 22114245]
- Luker KA, Beaver K, Leinster SJ, Owens RG. Information needs and sources of information for women with breast cancer: A follow-up study. *Journal of Advances in Nursing*. 1996; 23:487–495.

- Mayer DK, Terrin NC, Kreps GL, Menon U, McCance K, Parsons SK, et al. Cancer survivors information seeking behaviors: A comparison of survivors who do and do not seek information about cancer. *Patient Education and Counseling*. 2007; 65:342–350. [PubMed: 17029864]
- McCroskey JC, Teven JJ. Goodwill: A reexamination of the construct and its measurement. *Communication Monographs*. 1999; 66:90–103.
- Meredith KL, Jeffe DB, Mundy LM, Fraser VJ. Sources influencing patients in their HIV medication decisions. *Health Education Behavior*. 2001; 28:40–50. [PubMed: 11213141]
- Mills M, Davidson R. Cancer patients' sources of information: Use and quality issues. *Psycho-Oncology*. 2002; 11:371–378. [PubMed: 12228870]
- Narhi U. Sources of medicine information and their reliability evaluated by medicine users. *Pharmacy World and Science*. 2007; 29:688–694. [PubMed: 17479353]
- O'Brien M, Petrie K, Raeburn J. Adherence to medical regimens: Updating a complex medical issue. *Medical Care Review*. 1992; 49:435–454. [PubMed: 10123082]
- Puechal X. Antineutrophil cytoplasmic antibody-associated vasculitides. *Joint Bone Spine*. 2007; 74:427–435. [PubMed: 17574472]
- Rutten LJJ, Arora NK, Bakos AD, Aziz N, Rowland J. Information needs and sources of information among cancer patients: A systematic review of research (1980–2003). *Patient Education and Counseling*. 2005; 57:250–261. [PubMed: 15893206]
- Sleath B, Wurst K, Lowery T. Drug information sources and antidepressant adherence. *Community Mental Health Journal*. 2003; 39:359–368. [PubMed: 12908649]
- Squiers L, Rutten LJJ, Treiman K, Bright MA, Hesse BW. Cancer patients' information needs across the cancer care continuum: Evidence for the cancer information service. *Journal of Health Communication*. 2005; 10:15–34. [PubMed: 16377598]
- Thompson AE, Graydon SL. Patient-oriented Methotrexate information sites on the Internet: A review of completeness, accuracy, format, reliability, credibility, and readability. *Journal of Rheumatology*. 2009; 36:1–9. [PubMed: 19208527]
- Trewin VF, Veitch BA. Patient sources of drug information and attitudes to their provision: A corticosteroid model. *Pharmacy and World Science*. 2003; 25:191–196.
- Walsh M, Jayne D. Rituximab in the treatment of anti-neutrophil cytoplasm antibody associated vasculitis and systemic lupus erythematosus: Past, present and future. *Kidney International*. 2007; 72:676–682. [PubMed: 17609693]
- Williams JE, Anstrom KJ, Friedman JY, Schulman KA. Racial/ethnic variation in perceptions of medical information sources in Durham county, North Carolina. *North Carolina Medical Journal*. 2007; 68:391–398. [PubMed: 18236855]
- Woywodt A, Matteson EL. Wegener's granulomatosis—Probing the untold past of the man behind the eponym. *Rheumatology*. 2006; 45:1303–1306. [PubMed: 16887845]
- Verbrugge LM. Gender and health: An update on hypotheses and evidence. *Journal of Health and Social Behavior*. 1985; 26:156–182. [PubMed: 3905939]

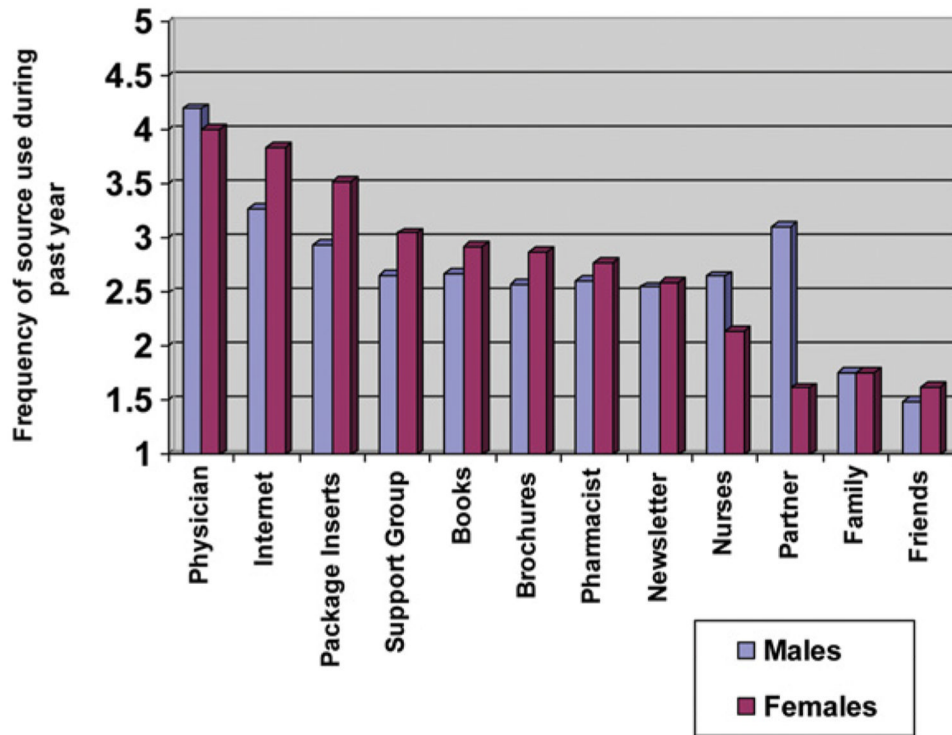


Figure 1. Frequency of medication information source use for male and female vasculitis patients during the past year ($n = 232$). Responses were reported on a 5-point scale ranging from 1 (*never*) to 5 (*always*).

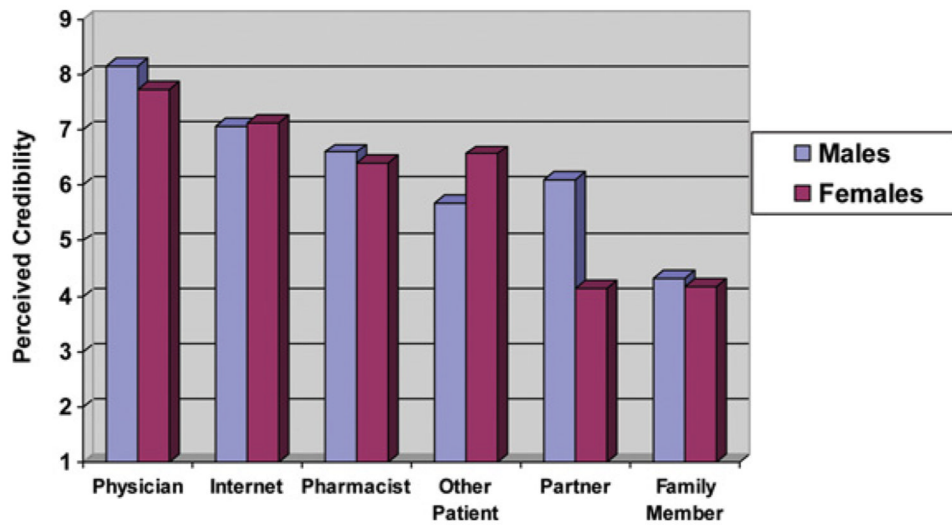


Figure 2. Perceived credibility ratings of six medication information sources for male and female vasculitis patients ($n=232$). Responses were reported on a 9-point scale ranging from 1 (*not at all expert/knowledgeable*) to 9 (*extremely expert/knowledgeable*).

Table 1
Sample characteristics for male and female vasculitis patients ($n = 232$)

Characteristic	<i>M ± SD or %</i>		Range
	Male ($n=71$)	Female ($n=161$)	
Age	54.75 ± 12.11	49.29 ± 13.79	21.0–82.0 years
White	95.77%	88.83%	
Education			4.0–22.0 years
High school or less	18.60%	18.83%	
Some college	15.72%	18.63%	
College graduate or more	65.71%	57.89%	
International participant	9.86%	25.80%	
In committed relationship	88.73%	77.64%	
Disease type			
Wegener's granulomatosis	71.83%	54.04%	
Churg-Strauss syndrome	11.27%	13.04%	
Microscopic polyangiitis	7.04%	8.07%	
Takayasu arteritis	0.00%	7.45%	
Other	9.86%	17.39%	
Years with disease	8.06 ± 6.60	5.77 ± 5.81	0.5–36.5 years
Health insurance	95.77%	92.45%	
Currently relapsing	22.54%	27.81%	

Note. On the basis of the results of independent samples *t* tests ($p < .05$), female participants were younger, more likely to be international participants, less likely to be married, less likely to have Wegener's granulomatosis, and had lived with vasculitis for fewer years than male patients.

Table 2
Analysis of covariance results contrasting male and female vasculitis patients' frequency of source use for 12 different medication information sources during the past year

Source	<i>M</i> ± <i>SD</i>		<i>F</i>	<i>p</i>
	Male (<i>n</i> = 71)	Female (<i>n</i> = 159)		
Spouse/partner	3.11 ± 1.9	1.62 ± 1.1	70.73	<.0001 *
Internet	3.27 ± 1.2	3.84 ± 1.1	12.39	<.001 *
Package inserts	2.94 ± 1.2	3.52 ± 1.3	11.70	<.001 *
Nurses	2.65 ± 1.2	2.14 ± 1.1	7.67	<.01 *
Support groups	2.67 ± 1.3	3.05 ± 1.3	4.33	.04 *
Brochures	2.57 ± 1.0	2.87 ± 1.2	3.31	.07
Books and articles	2.67 ± 1.0	2.92 ± 1.2	2.82	.09
Pharmacist	2.61 ± 1.3	2.78 ± 1.4	2.37	.12
Friends	1.49 ± 0.7	1.64 ± 0.9	1.04	.31
Physician	4.20 ± 0.9	4.01 ± 1.1	0.69	.41
Newsletters	2.55 ± 1.2	2.59 ± 1.3	0.35	.55
Family members	1.76 ± 1.1	1.75 ± 1.0	0.22	.58

Note. Frequency of source use responses reported on a 5-point scale ranging from 1 (*never*) to 5 (*always*). None of the control variables, including age, education, race, vasculitis type, international participant status, health insurance status, time since last relapse/flare, and disease duration, was significant.

* Significant *F* value, *p* < .05.

Table 3
T tests comparing perceived credibility of six medication information sources for male and female vasculitis patients (n = 232)

Source	Male		Female		t test statistic	p
	n	M ± SD	n	M ± SD		
Spouse/partner	62	6.10 ± 2.1	125	4.13 ± 2.3	5.45	<.0001*
Other patient	45	5.69 ± 2.1	131	6.57 ± 2.0	-2.52	.01
Physician	70	8.16 ± 1.3	161	7.74 ± 1.6	1.94	.05
Pharmacist	24	6.60 ± 2.1	75	6.41 ± 1.7	0.47	.64
Family member	47	4.31 ± 2.4	141	4.18 ± 2.4	0.32	.75
Internet	66	7.07 ± 1.6	150	7.12 ± 1.5	-0.25	.80

Responses were reported on a 9-point scale ranging from 1 (not at all expert/knowledgeable) to 9 (extremely expert/knowledgeable).

* t test significant if $p < .008$.