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Associations Between Patient Characteristics and Amount of Arthritis Medication Information Patients Receive

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Abstract

Little is known about factors associated with receipt of medication information among arthritis patients. This study explores information source receipt and associations between demographic and clinical/patient characteristics and the amount of arthritis medication information patients receive. Adult patients with osteoarthritis (OA) or rheumatoid (RA) arthritis ($n = 328$) completed an online cross-sectional survey. Patients reported demographic and clinical/patient characteristics and the amount of arthritis medication information received from 15 information sources. Bivariate and multivariable linear regression analyses were used to investigate whether those characteristics were associated with the amount of medication information patients received. Arthritis patients received the most information from health professionals followed by printed materials, media sources, and interpersonal sources. Greater receipt of information was associated with greater medication adherence, taking more medications, greater medication-taking concerns, more satisfaction with doctor medication-related support, and Black compared to White race. RA patients reported receiving more information compared to OA patients, and differences were found between RA patients and OA patients in characteristics associated with more information receipt. In conclusion, arthritis patients received the most medication information from professional sources, and both positive (e.g., greater satisfaction with doctor support) and negative (e.g., more medication taking concerns) characteristics were associated with receiving more medication information.

Since the 1990s, the United States has moved from a paradigm where doctors primarily furnished patients with health information to a world in which patients have more information sources at their disposal and are more informed and active in self-care roles (Fahy, Hardikar, Fox, & Mackay, 2014). Individuals living with arthritis, the most frequent

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cause of disability among adults in the United States (The Centers for Disease Control and Prevention, 2009), represent a group for which quality medication information is particularly important as they are likely to experience uncertainty and anxiety when faced with evolving treatment options, medication changes, unfamiliar terminology, medication related decisions, and adverse medication side effects (Carter, Moles, White, & Chen, 2013b). These challenges, coupled with the fact that arthritis patients commonly take multiple prescription medications and medication non-adherence for rheumatic disease is a substantial problem (Harrold & Andrade, 2009), bring about a specific set of information needs related to arthritis. With 52.5 million adults living with arthritis in the United States, and numbers projected to increase to 67 million by 2030 (Centers for Disease Control and Prevention, 2013), understanding how much medication-related information patients are receiving from which sources and what patient factors are associated with information-receipt is valuable for customizing health communication efforts to this growing demographic.

Obtaining arthritis medication-related information can serve important roles in arthritis management. It can increase an individual's health knowledge (e.g., an understanding of medication side effects), improve communication with health care providers, increase a patient's coping ability to manage his/her arthritis, and increase long term medication treatment adherence (Hay et al., 2008; Niedermann, Fransen, Knols, & Uebelhart, 2004). This is important because medication non-adherence and poor persistence can lead to poor outcomes such as increased risk of disease flares and disability (Contreras-Yáñez, Ponce De León, Cabiedes, Rull-Gabayet, & Pascual-Ramos, 2010). Yet, with the increasing availability of health information from various sources (e.g., Internet, medication packet inserts) which often varies in content and quality, comes more inconsistency in the accuracy of information received by the patient (Ansani et al., 2005; Carpenter, Elstad, Blalock, & DeVellis, 2014; Fahy et al., 2014; Impicciatore, Pandolfini, Casella, & Bonati, 1997).

Patients with osteoarthritis (OA) and rheumatoid arthritis (RA), the most prevalent types of arthritis (K. Ong, Wu, Cheung, Barter, & Rye, 2013), report multiple reasons for seeking health information, with researching treatment or medication options being a main reason given, second only to gathering general information about the condition (Hay et al., 2008). OA and RA patients report receiving drug related information from multiple information sources, including spoken, written, and electronic (Carpenter et al., 2014; DeLorme, Huh, & Reid, 2011). The Internet, package inserts, pharmacists, and doctors are the most frequently sited sources for prescription drug information with patients reporting doctors as the most reliable source (Carpenter et al., 2011; Carpenter et al., 2014; DeLorme et al., 2011; Närhi, 2007). Further, the largest amount of drug advertising dollars are spent targeting arthritis and other common chronic conditions (Findlay, 2001) and there is evidence suggesting more advertising is directed at drugs targeting RA compared to OA (Behrman, 2005). We are not aware of any studies specifically examining patient or arthritis-specific factors associated with arthritis patient receipt of medication information or the extent to which these factors are associated with OA compared to RA patients.

When considering factors that may be associated with medication information receipt, it is important consider that OA and RA involve different pathophysiologic mechanisms and

course progression, yet share similar features (Breedveld & Combe, 2011; Brooks, 2006; Carpenter et al., 2015). RA, a systemic autoimmune disease, is generally considered more disabling and its medication management more intensive compared to OA (Woolf & Pfleger, 2003; Yood, 2002). Further, RA patients have more frequent office visits and have higher medication costs for drugs such as biologic Disease-Modifying Antirheumatic Drugs (DMARDS) compared to OA patients (Lanes et al., 1997). OA can occur in any joint, results from factors including mechanical stress and biological processes over time and is mostly managed symptomatically with analgesics (e.g., acetaminophen and non-steroidal anti-inflammatory drugs) and glucosamine sulfate (Laba, Brien, Fransen, & Jan, 2013; Martel-Pelletier, Boileau, Pelletier, & Roughley, 2008; Woolf & Pfleger, 2003). In spite of the fact that RA and OA may be associated with different risk factors and different treatment strategies, they both present clinically with pain, stiffness and loss of function, resulting from cartilage destruction and joint inflammation (Brooks, 2006; Murphy & Nagase, 2008; K. Ong et al., 2013). Additionally, arthritis has been shown to negatively impact both OA and RA patients' health related quality of life, with OA patients perceiving their condition as similarly disabling in terms of physical and mental health as RA patients (Geryk, Carpenter, Blalock, DeVellis, & Jordan, 2014).

Existing theory and findings from the health information seeking literature offer guidance as to which demographic and clinical/patient factors may be related to patients receiving medication-related health information. The vast majority of research focuses on "information-seeking behavior" (i.e., actively acquiring information), a subset of research related to what has been termed "information behavior" or research focusing on how people seek information and the channels through which they gain access to information (Wilson, 1997). The Model of Information Behavior posits that information seeking is motivated by an individual's information needs and intervening variables (e.g., demographic, psychological, and interpersonal) (Wilson, 1997). The Risk Perception Attitude Framework posits that personal variables such as higher disease related anxiety and higher efficacy beliefs (confidence in one's ability to enact a health behavior) increase a patient's intentions to seek health information (Rimal & Real, 2003). Relatedly, one study found that patients accessing irritable bowel syndrome informational websites who report moderate to severe impairments in health status reported a willingness to take considerable risk to obtain symptom benefit (Drossman et al., 2009).

From the information-seeking literature, we know that demographic variables, such as patient age, gender, race, and educational level are related to health information-seeking. For example, women, better educated and younger individuals are often reported to seek more health information (Bundorf, Wagner, Singer, & Baker, 2006; Hay et al., 2008; Lustria, Smith, & Hinnant, 2011; Ramanadhan & Viswanath, 2006; Tu & Cohen, 2008). Among individuals with a chronic disease, clinical variables, such as disease type, years living with disease, disease severity and comorbidities have the potential to affect information-seeking (Ayers & Kronenfeld, 2007; Feinberg, Greenberg, & Frijters, 2015; Fox & Purcell, 2010; Wagner, Baker, Bundorf, & Singer, 2004). For example, in a years' time, individuals with hypertension tend to use the internet to obtain health information at lower rates (38%) compared to people with cancer (48%) and individuals who report lower health status tend

to seek information less compared to those reporting better health (Feinberg et al., 2015; Wagner et al., 2004).

That people are seeking medication-related health information and acting on the information they find is well established. However, little is known empirically about patient receipt of medication-related information, including solicited (e.g., seeking information) and unsolicited (e.g., being given information) information from various sources among individuals living with arthritis. A deeper understanding of arthritis patient receipt of medication related information from various sources and clinical/patient characteristics associated with amount of information received are of particular interest because some are modifiable and suited to intervention and all may be valuable aims for targeted or tailored medication-related communication messages. To understand arthritis patient receipt of medication-related information from various sources and associations between clinical/patient characteristics and receipt of medication information this study addresses the following two specific aims: 1) to quantify the amount and describe the sources patients use for arthritis medication information and 2) to analyze the relationship between demographic and clinical/patient factors and receipt of arthritis medication information.

Methods

Subjects

All data were derived from Information Networks for Osteoarthritis Resources and Medications (INFORM) study, a cross-sectional, 35–40 minute on-line survey that assessed the self-reported health behaviors and health status of arthritis patients. Eligible participants had a self-reported doctor-diagnosis of arthritis, were at least 18 years of age, could read and write in English, had Internet access, and were currently taking at least one medication to treat their arthritis on a routine basis. All participants were informed of a $10 incentive prior to answering eligibility questions and agreed to participate after reading a study fact sheet. The INFORM study was approved by the University of North Carolina's Institutional Review Board.

Recruitment methods have been described in detail elsewhere (Carpenter et al., 2014). Briefly, recruitment mailings were sent to persons having a diagnosis of osteoarthritis or rheumatoid arthritis according to University of North Carolina Hospital System records and general recruitment announcements were distributed via patient websites, local clinics, arthritis support groups, and in local media publications and advertising outlets. A total of 424 patients accessed the study survey between May 2010 and January 2011. Among those, 71 individuals were ineligible (34 did not meet eligibility criteria; 7 were missing screeners; 30 surveys were incomplete or duplicate); and 25 declined to participate after reading the fact sheet. Three hundred twenty eight patients completed the study survey; 124 were recruited from the hospital mailing and 204 from general announcements. We were unable to calculate a response rate because the number of arthritis patients who were exposed to the general announcements and advertisements was not known.

Measures

Receipt of medication information was obtained by asking how much medicine information they receive (either solicited or unsolicited) when they are prescribed a new arthritis medicine from the following fifteen different information sources: physicians, pharmacists, nurses, brochures and pamphlets, medicine package inserts, articles and books, newsletters, Internet (information websites), support groups (online or in-person), spouse/partner, family members other than their spouse, friends, media sources, commercials or advertisements, and podcasts. For each source, patients answered one item about how much medicine information they receive, ranging from 1= "none" to 4= "a lot." Patients' responses were averaged and higher mean scores correspond to obtaining greater amounts of medication information across sources. Additionally, the following three medication information source categories were created: 1. health professionals (i.e., doctors, pharmacists and nurses); 2. media (i.e., internet, media (e.g., TV, radio, videos, and podcasts); 3. interpersonal (i.e., support groups, spouse/partner, friends, and family); and, 4. printed material (i.e., brochures, medicine package inserts, research articles or books, newsletters).

Demographic Characteristics

Patients reported their age (categorized as 18–44 years, 45–64 years, and 65 years), gender (male, female), race/ethnicity (American Indian/Alaska Native, Asian, Black, Hispanic or Latino, Native Hawaiian/Pacific Islander, White, Other; categorized as Black, White and Other), and education level (8th grade or less, some high school but no diploma, high school graduate or GED, some college but no degree, associate's degree, bachelor's degree, postgraduate school or degree (considered as minimum number of years of schooling for each education level reported: 8,9,12,13,14,16,18).

Clinical/Patient Characteristics

Diagnosis information was obtained patient reports of their year of arthritis diagnosis, age at diagnosis, and doctor-diagnosed arthritis type (OA, RA).

Medication information was obtained using two questions. Patients were asked to report the number of different arthritis medicines (including prescription medicines, over-the-counter medicines, and creams) they were supposed to use according to their current treatment plan. To measure medication adherence, we used one item from the validated Vasculitis Self-Management Survey (VSMS) (percentage of medication doses taken exactly as directed) (response options were 0%–24%, 25%–49%, 50%–74%, 75%–99%, 100%; categorized as always adherent (%100) versus not always adherent (<100%) (Thorpe et al., 2007).

Arthritis severity (during the past 4 weeks) was assessed using one item ("Based on how you have been feeling during the past 4 weeks, please select the one number that best represents how severe you consider your arthritis to be."); responses ranged from: 1 = not at all severe to 10 = extremely severe (categorized as less than moderately severe, moderately severe and more than moderately severe).

Satisfaction with doctor support was measured using one item (How satisfied are you with the medication-related support provided by your doctor?); responses included: 1 = not at all

satisfied; 2 = a little satisfied; 3 = somewhat satisfied; and, 4 = very satisfied and were dichotomously considered as "less satisfied" (1, 2) and "more satisfied" (3, 4).

Co-morbidities were patient-reported types of major medical conditions (other than arthritis) when asked to, "Please list the other major medical conditions that you have." Using the Functional Comorbidity Index (including first and second stage comorbid conditions) (Groll, To, Bombardier, & Wright, 2005), we calculated a comorbidity count for each patient (ranging from 0 to 25).

Medication self-efficacy was determined by using the 7-item difficulty subscale from the Self-Efficacy for Appropriate Medication Use Scale (SEAMS) to measure medication adherence self-efficacy (Risser, Jacobson, & Kripalani, 2007). Respondents rated their level of confidence in their ability to take medications correctly in a number of difficult situations, including when they have a busy day planned, are away from home, or have multiple medications to take. The original response scale was modified from three points to five to capture greater variability. The modified scale ranged from "not at all confident" (coded as 1) to "very confident" (coded as 5). We created a summary score by averaging item responses. Higher scores represent greater levels of adherence self-efficacy (range 1–5). The internal consistency reliability for this sample was high (Cronbach's alpha = 0.91).

Arthritis medication-taking concerns were determined from respondents indicating how much of the time they are concerned about the following 6 aspects related to taking a new arthritis medicine: 1. taking medicines incorrectly; 2. Interactions with other medicines; 3. long-term effects of medicines; 4. financial costs; 5. side effects; and 6. medicines not working on a five-point Likert-type scale, ranging from 1 = none of the time to 5 = all of the time. Scores obtained for the individual items were summed to give a scale score. Higher scores indicate more concern about taking arthritis medicine.

Statistical analysis

Analyses were conducted using SAS software, version 9.3 (SAS Institute, Cary, NC). Simple descriptive statistics (frequencies and percentages for categorical variables, means ± standard deviations (SD) for continuous variables) were used to summarize sample demographic and clinical/patient characteristics. Demographic (i.e., age, gender, race/ethnicity, education) and clinical/patient (i.e., arthritis type, number of medications, medication adherence, arthritis severity, arthritis duration, satisfaction with doctor support, comorbidities, medication self-efficacy, arthritis medication taking concerns) variables were evaluated using bivariate analyses for their association with receipt of medication information using Student's t-tests, ANOVA and Pearson's correlation coefficients, as appropriate. Any variables significantly (p 0.05) associated with receipt of medication information were then included as explanatory variables in a multivariable linear regression model using receipt of medication information as the continuous outcome variable. Linear regression analyses were also performed considering OA and RA separately to test which clinical/patient characteristics may be associated with receipt of greater amounts of medication information. All statistical tests were 2-tailed with α=0.05. Linear regression was run in a forward stepwise method based on the Wald's test predicting receipt of arthritis medication information.

Results

The demographic and clinical/patient characteristics of study participants are shown in Table 1.

Patients' receipt of medication information from specific sources and amount

A total of 324 (99%) participants reported receiving medication related information from at least one source when they are prescribed a new arthritis medicine. Of these patients, most reported receiving information from physicians (M 3.30; SD .82), followed by medication package inserts, (M=2.70, SD=1.04), the Internet (M=2.66, SD=1.07), and brochures (M=2.49, SD=1.03); the least amount of information was received through podcasts (M=1.12, SD=0.46) followed by support groups (M=1.35, SD=0.77).

The average amount of medication information patients received when prescribed a new arthritis medication by source category was the following: 2.52 (SD=.73) from health professionals, 1.9 (SD=.64) from media sources, 1.62 (SD=.63) from interpersonal sources, and 2.26 (SD=.73) from printed material. All between-group differences were statistically significant at $p<0.001$ (receiving more information from health professional versus media sources (t(324)=12.83); health professional versus interpersonal sources (t(321)= 21.57); health professional versus printed material (t(323)=6.29); media versus interpersonal sources (t(321)= 8.53); printed material versus media sources (t(323)=9.63); and printed material versus interpersonal sources (t(321)=15.91)).

Two percent (8/327) of patients indicated that they did not receive any information from health professionals, 12% (38/324) from media sources, 28% (89/322) from interpersonal sources and 8% (25/324) from printed material. Patients reported not receiving any medication related information from a pharmacist or nurse, 33% and 49% of the time, respectively.

Bivariate Analyses: variables associated with receipt of arthritis medication information

Greater receipt of information was associated with moderate arthritis severity compared to lower than moderate severity, rheumatoid arthritis compared to osteoarthritis, Black race compared to White and Other race, more years of schooling, greater number of medications taken, more satisfaction with doctor medication-related support, always adherent compared to not always adherent, more medication-taking concerns, and having a comorbid condition(s) compared to having no comorbidity (Table 2).

Multivariate Analysis: variables associated with receipt of arthritis medication information

In multivariate analysis (Table 3) that examined RA and OA patients together in a single sample, of the variables that had significant bivariate associations with medication information receipt, the following independent variables remained statistically significant: always adherent compared to not always adherent, greater number of medications taken, more medicine-taking concerns, more satisfaction with doctor medication-related support, and Black race. These variables together explained 21.1% of the variance of medication information-receipt ($R^2 = .21$; $P < .0001$).

Table 3 also displays results examining information seeking for OA and RA patients separately. When considering OA, of the variables that had significant bivariate associations with more medication information receipt, the following independent variables remained statistically significant in a linear regression: greater number of medications taken, greater years of schooling, and more satisfaction with doctor medication-related support. When considering RA, of the variables that had significant bivariate associations with more medication information receipt, the following independent variables remained statistically significant: Black race and greater number of medications taken.

Discussion

To our knowledge, this is the first study to examine whether demographic and clinical/ patient factors are associated with arthritis patients' receipt of medication information. Previous studies have mostly explored predictors of health information seeking, in general, rather than receipt of medication related information specifically, analyzed single information sources such as the Internet rather than considering multiple sources influencing information receipt, and considered information seeking behavior rather than information receipt which takes both solicited and unsolicited health information into account. Our results add to the health information literature by showing specific differences, across individuals with arthritis, OA and RA associated with their receipt of medication information. Patient characteristics, the nature of the medication therapy and also the doctor-patient relationship were all found to be associated with the amount of information patients with arthritis report receiving. Findings for OA and RA deepen our understanding of condition specific factors associated with receipt of medication-related information. In addition, the findings quantify the amount of information received and describe the sources through which arthritis patients are receiving medication related information.

While one patient reported not receiving any information from any source, the overwhelming majority of patients in this sample reported receiving medication related information from at least one source when they are prescribed a new arthritis medicine. In agreement with previous studies, we found patients received medication information from various sources and reported receiving more information from health professionals compared to media, interpersonal and print sources (Carter et al., 2013b; Shieh, McDaniel, & Ke, 2009). Next in line after doctors among the individual sources from which patients received arthritis medication information was medication package inserts followed by the internet. This finding was not surprising, considering the more accessible the information source, the more likely one is to use that source (O'Reilly, 1982) and the majority of rheumatology patients research their conditions online around the time of doctors' appointments (Hay et al., 2008). Further, patients may be reporting less information receipt from traditional media sources (e.g., TV and radio) as direct-to-consumer pharmaceutical advertising is shifting into online promotion (e.g., search engine marketing and product Web sites) (Ventola, 2011).

Our study provides evidence of important correlates of information receipt which have not been considered in other arthritis studies. We found that patients who report being 100% adherent to medications received greater amounts of medication related information

compared to patients who reported being less adherent. This finding is not supported by another study that found nonadherent patients [inflammatory bowel disease] were 2.4 times more likely to be active information seekers compared to adherent patients (Pittet et al., 2014). In our study, information receipt included solicited (e.g., seeking information) and unsolicited (e.g., being given information) medication-related information from 15 sources whereas, the previously described study considered only active information seeking from 6 sources. This is an important distinction because studies assessing information seeking would only include information from health professionals, for example, if the patient specifically requested information or asked questions about certain medications (Barsevick & Johnson, 1990). A more inclusive consideration of solicited and unsolicited receipt of information from a larger number of sources likely provides a better approximation of the amount of information patients receive than using information seeking behavior alone and fewer sources. More research is needed to understand the mechanisms through which receipt of medication information (i.e., passive versus active receipt) may influence health behaviors such as medication adherence.

The more medications patients in our sample were taking, the more arthritis medication information they reported receiving. When considered seprately, this finding also held for RA patients and OA patients. Different from our findings, one study found that the degree of information seeking did not vary by reported number of drugs taken (DeLorme et al., 2011). Here too, DeLorme et al. assessed information seeking rather than information receipt and different methodological measures makes comparison across studies difficult. There is a need for the development of working outcome definitions that could be used and compared in studies conducted across disciplines. A better understanding of number of arthritis medications taken and information receipt has important implications for arthritis patients' information needs such as helping patients receive consistent high quality medication information and navigating issues associated with reliable source use and receipt of conflicting medication information.

Our results related to medication taking concerns are in line with theory suggesting that disease related anxiety may play a role in information receipt, and current research findings related to patient worry and sensitivities around medication taking. Health information seeking has been described as a coping behavior to reduce an individual's stress and worry associated with uncertainty (Lambert & Loiselle, 2007). Research shows that patients who believe they are highly sensitive to medicines (e.g., more likely to experience medication side effects) are more likely to seek information about medicines (Carter et al., 2013b). High medication seeking from all sources has also been found to be related to worry about the health consequences of taking medication, particularly among those with a recent medication change (Carter et al., 2013b). It is likely that greater patient worry increases the belief that the information provided will be relevant and help them manage their medicines (Carter, Moles, White, & Chen, 2013a).

Patients in this sample who were more satisfied with doctor medication-related support received more arthritis medication information. This finding is in line with research showing higher quality physician-patient relationships can increase or encourage discussion about disease management and treatment options (Beach, Roter, Wang, Duggan, & Cooper, 2006).

A review of doctor-patient communication found greater patient satisfaction with a medical visit was associated with more information provided by the doctor and longer appointment times (L. Ong, De Haes, Hoos, & Lammes, 1995). When considering OA and RA separately, we were surprised that doctor support was associated with receiving more medication information for OA patients but not RA patients because RA patients have more frequent office visits compared to OA patients (Lanes et al., 1997).

Our finding that Black race compared to White race is associated with more medication information seeking for arthritis patients (and RA patients) was not expected. Research findings are mixed, with one study suggesting that whites seek more health information compared to Blacks (Laz & Berenson, 2013) while other findings show no differences in race related to information seeking behaviors (Cotten & Gupta, 2004). Our findings may reflect research showing that race has not been found to be associated with receiving arthritis-specific care or prescription arthritis medicines (Mikuls, Mudano, Pulley, & Saag, 2003) and that among online adults, evidence of a digital divide no longer exists, with blacks going online on mobile devices more frequently than whites (Kontos, Blake, Chou, & Prestin, 2014; Smith, 2012). Additionally, considering findings from one study showing that among osteoarthritis patients, Black patients were less likely than white patients to report a good understanding of joint replacement as a form of treatment, it may be that RA is a less well known condition among Black patients compared to other races (Ibrahim, Siminoff, Burant, & Kwoh, 2002).

Almost one third of patients in this sample reported not receiving any medication information from interpersonal sources, including spouse, family, and friends. It seems expected that during a time when patients are likely to experience specific information needs related to being prescribed a new arthritis medication, they would tend to receive information from clinical or media sources more than interpersonal sources. This is likely because health professionals generally provide factual information, while lay sources provide both factual and emotional information (Kjos, Worley, & Schommer, 2011).

We found an inverse association for patients with OA between less years of schooling and greater receipt of medication information, which is consistent with previous studies associating higher education levels with more information seeking (Bundorf et al., 2006; Kontos et al., 2014; Lustria et al., 2011). The mechanisms are surely multifactorial but partially may be attributable to education acting as a proxy for greater expected benefits of health information (Bundorf et al., 2006) and issues of health literacy and eHealth literacy (Kontos et al., 2014). Limitations

While this study has identified important and some potentially modifiable patient/clinical characteristics (e.g., increased adherence and more medication taking concerns) that are associated with patients receiving more medication information, we cannot determine whether the explanatory variables in our regression models were a cause or consequence of greater patient receipt of information. Longitudinal follow-up studies will be required to determine whether demographic and patient/clinical characteristics predict more information receipt in arthritis patients.

It is also possible that patients with severely disabling RA or OA, those with mild OA, those without internet access or computer literacy skills were underrepresented in our online survey sample, which impedes our ability to generalize the results to larger population of OA and RA patients. Further, our low response rate for mailed recruitment efforts represents a selection bias and our sample was largely White, college-educated and female, which further limits the study's generalizability. In addition, we were not able to assess demographic differences between those who responded to the survey and those who did not.

As with any survey, there is the potential for bias in self-reports; not verified through clinical records or other assessment. However, self-reported medical information for chronic diseases has been shown to have good sensitivity and specificity compared to patient medical record information (Fowles, Fowler, & Craft, 1998). Finally, though our regression model was significant, it only explained a small amount of variance in medication related information-receipt. This could be due to measurement error, but may also reflect the fact that additional and multiple intrapersonal, interpersonal, and macro level factors are involved in explaining additional variance.

Conclusion and Implications

Arthritis patients in this sample took an average of two arthritis medications and received more medication information from professional and media source than print and interpersonal sources. Both positive (e.g., increased adherence, greater satisfaction with doctor medication-related support, and negative (more medication taking concerns) clinical/ patient characteristics were associated with receiving more medication information. In the clinic setting, it may be valuable for doctors to devote time to talking with patients about aspects of medication related information through the lens of information sources with the goal in mind of providing high quality resource options to help increase patient knowledge, reduce anxiety, and improve medication adherence. Public health efforts related to medication education for arthritis patients should focus on professional and media source delivery.

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Table 1

Sample characteristics (N=328)

	N (%)
Gender	
Male	68 (21)
Female	260 (79)
Race	
White	263 (80)
African American	45 (14)
Other	20 (6)
Age group (years)	
18–44 years	50 (15)
45–64 years	192 (59)
65 years	86 (26)
Education level	
High school diploma	50 (15)
At least some college	114 (35)
Completed college or greater	164 (50)
Arthritis type	
Osteoarthritis	149 (48)
Rheumatoid arthritis	159 (52)
Arthritis duration (years)	
< 6 years	117 (36)
6–19 years	158 (48)
20 years	53 (16)
Arthritis severity	
Less than moderate	106 (32)
Moderate	94 (29)
Greater than moderate	127 (39)
Arthritis medication(s)	
1 medication	83 (26)
2 medications	113 (35)
medications	129 (39)
Comorbid conditions	
Yes	159 (49)
No	168 (51)
Medication adherence	
Always adherent	163 (50)
Less than always adherent	160 (50)
Satisfaction with doctor support	
More satisfied	266 (84)
Less satisfied	52 (16)

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Values represent numbers of patients (percentage).

Table 2

Bivariate analyses: variables associated with receipt of arthritis medication information

Correlation with receipt of medication information score			
	r	**(n)**	**p-value**
Number of Medications	0.27	(286)	<.0001
Years of education	−0.19	(288)	0.001
Medication taking concerns score	0.21	(280)	0.004

Mean receipt of medication information score per category			
	Mean ± SD	**(n)**	**p-value**
Race			0.0008
White	2.02 ± .50	(262)	
African American	2.33 ± .65	(45)	
Other	1.94 ± .39	(20)	
Arthritis type			0.0013
Osteoarthritis	1.96	(149)	
Rheumatoid arthritis	2.16	(158)	
Arthritis severity			0.04
Less than moderate	1.95	(105)	
Moderate	2.17	(94)	
Greater than moderate	2.08	(127)	
Satisfaction with doctor support			0.01
More satisfied	2.09 ± .50	(234)	
Less satisfied	1.86 ± .51	(46)	
Medication adherence			0.01
Always adherent	2.1 ± .54	(145)	
Less than always adherent	1.9 ± .46	(140)	
Comorbid condition			0.03
Yes	2.1 ± .55	(155)	
No	1.9 ±	(164)	

Table 3

Independent variables associated with receipt of arthritis medication information identified by multivariable linear regression analyses

	Receipt of arthritis medication information								
	OA and RA patients (n = 328)			Only OA patients (n = 149)			Only RA patients (n = 59)		
	Estimate	SE	p-value	Estimate	SE	p-value	Estimate	SE	p-value
Predictor									
Intercept	1.63	0.10	<.001	2.39	.26	<.0001	1.90	.09	<.0001
Medication adherence									
Always vs not always	0.13	0.06	.02	—	—	—	—	—	—
Number of medications									
Per additional medication	0.09	0.02	<.001	0.15	.03	<.0001	.06	.03	.04
Medication-taking concerns									
Average increase in anxiety score	0.11	0.03	.001	—	—	—	—	—	—
Satisfaction with doctor support									
More vs less satisfied	0.21	0.08	.01	0.28	.10	.01	—	—	—
Race (reference = White)									
Black	0.25	0.08	.002	—	—	—	.41	.11	<.0001
Other	−0.10	0.11	.36	—	—	—	—	—	—
Schooling									
As years of schooling increase	—	—	—	−0.04	.02	.01	—	—	—