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Kathleen S. Slauson-Blevins

Old Dominion University, kslauson@odu.edu

Julia McQuillan

University of Nebraska-Lincoln, jmcquillan2@Unl.edu

Arthur L. Greil

Alfred University, fgreil@alfred.edu

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Online and in-person health-seeking for infertility

Kathleen S. Slauson-Blevins,¹ Julia McQuillan,² and Arthur L. Greil³

1. Old Dominion University, Department of Sociology and Criminal Justice, 6032 Batten Arts and Letters, Norfolk, VA 23529, USA. Corresponding author: kslauson@odu.edu

2. University of Nebraska–Lincoln, Department of Sociology, 706 Oldfather Hall, Lincoln, NE 68588, USA; jmcquillan2@unl.edu

3. Alfred University, Social Sciences Department, Olin Building 208B, Alfred, NY 14802, USA; fgreil@alfred.edu

Abstract

Using data from Wave 1 (2004–2006) of the National Survey of Fertility Barriers (NSFB), a national probability sample of women ages 25–45, we examine online information-seeking among ever-infertile women. Of the 1352 women who met criteria for infertility, 459 (34%) neither talked to a doctor nor went online for information, 9% went online only for information, 32% talked to a doctor but did not go online, and 25% did both. Guided by Chrisman's Health-Seeking Model and previous research on Internet use to obtain health information, we employ multinomial logistic regression to compare these four groups of ever-infertile women. Findings generally support Chrisman's model. Infertile women tend to seek information online as a complement to, rather than as a substitute for, in-person health-seeking. Greater faith in the ability of medical science to treat infertility and greater perceived stigma were associated with higher odds of using the Internet to obtain information about infertility. In general, women who perceived the symptoms of infertility as more salient had higher odds of using both online and in-person or only in-person health-seeking compared to online health-seeking. Women with greater resources had higher odds of using online sources of information. Strong network encouragement to seek treatment was associated with higher odds of in-person health-seeking and combining in-person and online health-seeking compared to only going online or doing nothing.

Keywords: United States, Infertility, Internet, Health-seeking, Life course, Stigma

As of 2012, 81% of Internet users have searched for health information online (Fox, 2013), with the majority looking for information about a specific condition or disease (Fox & Fallows, 2003). Seeking health information online is an important area to explore because it is becoming more common, because physicians have expressed concern over the quality of online health information (Silberg, Lundberg, & Musacchio, 1997), and because online information-seeking may be changing health-seeking processes. To date it is unclear whether going online for health information is complementing, altering, or replacing the process of in-person health-seeking.

Infertility, defined as twelve months of unprotected intercourse without conception (American Society for Reproductive Medicine, 2008), is a particularly appropriate condition for assessing use of the Internet for health information. Infertility is a condition for which treatment is discretionary; adoption and a child-free lifestyle are alternatives to treatment. In addition, infertility is a stigmatized condition, and the anonymity provided by the Internet may be particularly attractive to those with stigmatizing health problems (Berger et al., 2005; Kahlor & Mackert, 2009; Powell et al., 2003).

Studies examining use of the Internet for infertility are usu-

ally descriptive. Many studies employ online samples, thus limiting our ability to compare those who go online to those who do not. Other studies rely on clinic samples and therefore exclude those who go online only or do no health-seeking. Using Chrisman's (1977) health-seeking framework, we explore what factors are associated with patterns of health-seeking activities among infertile women. We employ multinomial logistic regression to compare four groups of infertile women: women who did not do any health-seeking, those who only went online for information, those who only saw a doctor, and those who did both.

Theoretical and empirical background

Chrisman (1977) has proposed a holistic approach to understanding health behavior and decision-making. Chrisman defines health-seeking as the activities that *non-practitioners* undergo in their attempt to address a health condition. The Health-Seeking Model suggests that after identifying a symptom people will make illness related shifts in their role behavior and consult with members of their social network about possible ways to manage a condition. Network mem-

bers can also provide cues as to when medical interventions are needed. People often try to exhaust all possible options to manage a health condition on their own before consulting a professional, but Chrisman (1977) acknowledges that several strategies may be employed simultaneously. In this study, we examine how individual characteristics, symptom salience, resources, and social network encouragement are associated with patterns of health-seeking among women with infertility.

Individuals can undertake a wide range of health-related activities online (Fox & Fallows, 2003). Pandey, Hart, and Tiwary (2003) have suggested that it can "cost" a lot, both in terms of time and money, to obtain health information from traditional sources. Research suggests that online information-seeking is common among patients at infertility clinics (Haagen et al., 2003; Wingert et al., 2005). Haagen et al. (2003) surveyed couples attending a fertility clinic and found that 66% of couples with Internet access were using the Internet for infertility-related activities. The majority (72%) sought information, while 41% reported seeking social support. Most searches were for information about a specific diagnosis or treatment (Huang et al., 2003; Weissman et al., 2000). Women also search for information on the causes of infertility (Haagen et al. 2003), information to evaluate clinics (Weissman et al., 2000), or information on alternative treatments (Porter & Bhattacharya, 2008).

Chrisman's Health-Seeking Model and prior studies suggest that people generally exhaust non-medical options before seeking medical treatment. Therefore we expect that women will use online information-seeking as a step on the way to or as a complement to in-person health-seeking rather than as an alternative. Women with more positive attitudes towards medical science might use the Internet to find more detailed information, but those with more negative attitudes could prefer to do their own search rather than endure an in-person encounter with a medical professional. Bunting and Boivin (2007) found that people delayed seeking treatment if they feared receiving a label of "infertile." Because the Internet offers those with stigmatized conditions a means of accessing information and support that they otherwise might not access due to the desire to keep a health condition hidden (Berger et al., 2005), we expect higher perception of infertility as stigmatizing to be associated with higher odds of seeking information online.

The Health-Seeking Model suggests that higher symptom salience is likely to lead to more active engagement with health-seeking behaviors. We assess symptom salience by whether or not people perceive that they have a fertility problem, desire for a child, the strength and immediacy of the intent to have a child, and whether or not they have prior children (primary versus secondary infertility). Based on prior research, we expect that infertile women who perceive that they have a fertility problem (White, McQuillan, Greil, & Johnson, 2006), would like to have a child (McQuillan, Greil, & Shreffler, 2011), have stronger intentions to have a child at the time of the infertility episode, and who have no prior children (Greil, McQuillan, Shreffler, Johnson, & Slauson-Blevins, 2011) will be more likely to engage in both online and in-person health-seeking.

Access to resources has been linked to Internet use generally (Powell et al., 2003) and health information-seeking online specifically (Ayers and Kronenfeld, 2007; Cotton and Gupta, 2004). Therefore higher levels of education and family income, having private health insurance, and having a regular doctor should be associated with both online and in-person health-seeking. In addition, younger women are more likely to use the Internet than older women (Fox, 2011); therefore, Internet use for infertility should be inversely related to age.

The Health-Seeking Model also suggests that social networks influence health-seeking. Among women trying to get pregnant, those who perceive that their close family and

friends wanted them to see a doctor were more likely to do so (Bunting & Boivin, 2007). Having a partner who would like to have a baby and having parents who would like to become grandparents should be related to higher levels of both online and in-person health-seeking. Talking to friends and family about infertility and perceived pressure from friends and family to seek help should facilitate health-seeking, but it is also possible that women who do not get such encouragement through direct interaction may seek it online.

Methods

Data come from the National Survey of Fertility Barriers (NSFB), a national probability sample of women ages 25–45 years of age. The NSFB was designed to assess the social, psychological, and health factors associated with women's and couple's fertility and childbearing choices. NSFB survey data was collected between September 2004 and December 2006 during which interviews were conducted with 4796 women and some of their partners. To identify women at risk for infertility, the survey included screening questions. Using the American Association of Public Opinion Research (AAPOR) response rate number 4, the response rate to the screener is 53 percent, typical for contemporary Random Digit Dialing (RDD) surveys (McCarty, House, Harman, & Richards, 2006). For more details on the generalizability of the sample, see the methodology report located at <http://sodapop.pop.psu.edu/data-collections/nsfb/dnd>.

Although 2363 women were identified as infertile, a large number of cases ($n = 987$) were excluded because they were not trying to get pregnant at the time of their episode and reported that they had never wondered if they had a medical problem. An additional 24 women had excessive missing data. Our final analytic sample ($N = 1352$) includes heterosexual women who had infertility with intent (said that they were "trying" to conceive at the time), infertility without intent (were "okay either way" about conceiving a child at the time), or other physical health barriers (e.g. diabetes or cancer) that prevented them from having desired children.

The main outcome for this study was the *type of health-seeking*: 1) no health-seeking, 2) Internet only, 3) in-person only, and 4) both online and in-person health-seeking. Women were classified as having engaged in in-person health-seeking if they reported talking to a doctor about getting pregnant. Not all women who consulted a doctor also underwent tests and treatments. In order to assess Internet use, participants were asked if they had ever looked on the Internet for information about getting pregnant. Details about variables suggested by the Health-Seeking Model and previous research and therefore included in the analysis can be found in Table 1.

We use multinomial logistic regression to predict the odds of being in the four health-seeking categories. Multinomial logistic regression is appropriate for dependent variables with more than two non-ordered categories (DeMaris, 1995) and allows us to compare coefficients across groups.

Results

More women did no health-seeking (34%) than went online only (9%), saw a doctor (32%), or both went online and talked to a doctor (25%). We provide descriptive statistics for the sample at <http://digitalcommons.unl.edu/sociologyfacpub/222>. Table 2 presents the multinomial logistic regression analysis. For ease of interpretation, we provide two figures. Fig. 1 compares each type of health-seeking to no health-seeking, and Fig. 2 compares the three categories of women who engaged in health-seeking to one another.

Table 1. Independent variables used in the analysis.

Name	Description
<i>Individual characteristics</i>	
Attitudes towards medical science	Constructed by averaging 3 items concerning faith in medical treatment for infertility (e.g. "With the medical advances available today, women can wait to have a baby until their late 30 s and still have a good chance of having a baby").
Locus of control	Constructed by averaging 6 items measuring perceived control over one's health (e.g. "If I get sick, it is my own behavior which determines how soon I get well again") ($\alpha = .71$).
Religiosity	Constructed by averaging responses to 4 questions (e.g. "How often do you attend religious services?") ($\alpha = .73$).
Stigma	Constructed by averaging 3 items concerning perceptions of public attitudes concerning people with infertility (e.g. "People who experience infertility often feel that their family and friends look down on them").
Importance of motherhood	Constructed by averaging responses to 5 questions (e.g. "Having children is important to my feeling complete as a woman") ($\alpha = .72$).
Age	Measured in years.
In a relationship	1 = Currently in a relationship, 0 = All other statuses.
<i>Symptom salience</i>	
Perception of a Problem	Measured by affirmative responses to either of the following questions: "Do you think of yourself as someone who has, has had or might have trouble getting pregnant?" or "Do you think of yourself as someone who has or has had fertility problems?"
Desire for a baby	"Would you, yourself, like to have a(nother) baby?" 1 = Definitely yes, 0 = All other responses.
Intentions	Variable constructed from 2 items, "Do you intend to have a baby?" and "Of course sometimes things do not work out exactly as we intend them to or something makes us change our minds. In your case, how sure are you that you will have (or not have) a child?" Response categories range from (2) "very sure intend" to (-2) "very sure no intent."
Infertile with intent	Women who said they were trying to get pregnant were coded as 1. Reference category is infertile without intent.
Other fertility barriers	Women with a history of medical problems, complications, or surgeries that would make it difficult or impossible to get pregnant, but who did not meet the criteria for infertility with or without intent were coded as 1. Reference category is infertility without intent.
Primary infertility	Women who have never had a live birth were coded as 1. Reference category is women who have had one or more children.
<i>Resources</i>	
Family income	Total family income expressed in \$1000 units.
Education	Years of formal schooling.
Private health insurance	"Are you covered by private health insurance, by public health insurance such as Medicaid, or some other kind of health care plan or by no health insurance?" 1 = Private health insurance, 0 = All other answers.
Has a regular doctor	Respondents were asked if they had a <i>regular doctor</i> that they consulted for their health care needs. 1 = Yes, 0 = No.
Race/ethnicity	Standard us census wording. Dummy variable constructed for non-white compared to white women.
<i>Social network factors</i>	
Partner would like a(nother) baby	"How about your [husband/partner]? Would [he/she] like to have a(nother) baby?" 1 = Definitely yes, 0 = All other responses.
Children important to partner	"It is important to my partner that we have children," 1 = Strongly agree, 0 = All other answers.
Children important to parents	"It is important to my parents that I have children," 1 = Strongly agree, 0 = All other answers.
Talked to others about concerns	Dummy variable comparing women who reported that they often talked about their fertility concerns with family and friends (=1) compared to women who said that they only communicated with others occasionally, seldom, or never (=0).
Similar others	Assesses whether women talked to other individuals who experienced similar fertility difficulties often or occasionally (=1) compared to women who said they seldom or never did this (=0).
Social support	4-item scale based on Sherbourne and Stewart (1991). "How often is each of the following kinds of support available to you if you need it?" Example, "Someone to give you good advice about a crisis?" 4 = Often to 1 = Never. ($\alpha = .84$).
Friends pursued treatment	"Have family/friends pursued medical help to help get pregnant?" 1 = Yes, 0 = No.
Partner encouraged treatment	"Did your husband/partner strongly encourage, encourage, discourage, or strongly discourage seeking medical help or was it mixed?" 1 = Strongly encouraged, 0 = All other answers.
Friends/family encouraged treatment	"Did your family or friends strongly encourage, encourage, discourage, strongly discourage seeking medical help or was it mixed?" 1 = Strongly encouraged, 0 = All other answers.

Positive attitudes toward medical science were associated with increased odds of going online only or doing both compared doing nothing or doing in-person health-seeking only. Higher perceived stigma of infertility is associated with more online than no health-seeking, and less in-person than online-only health-seeking. Perception of a fertility problem and having infertility with intent is associated with higher likelihood of only in-person or doing both compared to doing nothing and with higher likelihood of only in-person or doing both compared to online only. In general, women who perceived the symptoms of infertility as more salient had higher odds of using more health-seeking modalities and of engaging in in-person health-seeking compared to online health-seeking.

Higher education and income were associated with more online or both types of health-seeking compared to doing

nothing or seeing a doctor in-person only. Having access to a regular doctor was associated with doing in-person only or both types of health-seeking compared to doing nothing. Women who have private insurance were more likely to do in-person only and both types of health-seeking compared to just going online. Older women had lower odds of only Internet health-seeking and higher odds of in-person health-seeking than younger women.

Having a partner who encouraged treatment was associated with higher odds of doing in-person health-seeking only or both compared to online only or no health-seeking. Having family and friends encourage going to a doctor was associated with higher odds of in-person health-seeking only compared to doing nothing or doing both. Talking to others who sought treatment was associated with doing in-person only or

Table 2. Odds ratios for type of health-seeking by individual characteristics, symptom salience, resources, and social network factors.

Type of Help Seeking Variable	None (reference)						Internet only (reference)						In-person only (reference)					
	Internet only			In person only			Both			Medical only			Both			Both		
	OR	SE	P	OR	SE	P	OR	SE	P	OR	SE	P	OR	SE	P	OR	SE	P
<i>Individual characteristics</i>																		
Internal med loc of control	1.002	.23		.916	.16		1.215	.19		.914	.23		1.212	.24		1.327	.17	
Attitudes towards med science	1.957	.28	*	1.030	.19		1.718	.23	*	.526	.29	*	.878	.30		1.667	.21	*
Religiosity	.984	.19		.921	.13		.683	.14	**	.936	.19		.694	.19		.741	.12	*
Stigma	1.539	.22	*	.836	.16		1.193	.18		.543	.23	**	.775	.23		1.428	.17	*
Importance of motherhood	.564	.26	*	.588	.19	**	.779	.22		1.044	.27		1.382	.27		1.324	.20	
Age (in years)	.912	.02	***	1.039	.02	*	.957	.02	*	1.139	.02	***	1.049	.02	*	.921	.02	***
In a relationship	1.524	.30		1.122	.21		1.048	.25		.736	.32		.688	.33		.934	.24	
<i>Symptom salience</i>																		
Perception of a problem	1.128	.25		2.274	.18	***	3.110	.23	***	2.015	.26	**	2.756	.29	***	1.368	.24	
Desire for a baby	.989	.31		1.202	.23		1.961	.25	**	1.215	.32		1.983	.32	*	1.631	.23	*
Intentions	1.367	.11	**	1.086	.08		1.437	.09	***	.794	.11	*	1.051	.11		1.323	.09	**
Infertile with intent																		
Infertile with no intent (omitted)																		
Infertile with intent	1.334	.28		3.200	.21	***	5.494	.28	***	2.398	.31	**	4.117	.34	***	1.717	.29	
Other fertility barrier	.974	.33		1.032	.27		2.272	.33	*	1.059	.37		2.332	.39	*	2.202	.35	*
Primary infertility	1.476	.31		1.284	.24		2.677	.25	***	.871	.31		1.814	.30	*	2.084	.22	**
<i>Resources</i>																		
Family Income (1 k units)	1.207	.05	***	1.007	.04		1.148	.04	**	.834	.06	**	.951	.06		1.140	.04	**
Education (in years)	1.154	.05	**	1.017	.03		1.265	.04	***	.881	.05	*	1.096	.05		1.244	.04	***
Private health insurance	.629	.29		1.357	.21		1.449	.25		2.157	.30	*	2.303	.31	**	1.068	.24	
Has a regular doctor	1.237	.30		1.898	.23	**	2.507	.28	**	1.534	.32		2.027	.34	*	1.321	.29	
<i>Race</i>																		
White (omitted)																		
Non-white	.911	.25		.834	.18		.687	.21		.915	.26		.754	.27		.824	.20	
<i>Social network factors</i>																		
Partner like a(nother) baby	1.297	.31		.863	.24		.615	.27		.665	.32		.474	.33	*	.713	.25	
Children important to partner	1.207	.29		.921	.22		.732	.25		.763	.30		.606	.31		.794	.22	
Children important to parents	.938	.26		.998	.20		.825	.22		1.064	.27		.880	.28		.827	.20	
Talked to others about concerns	1.169	.32		2.114	.22	**	2.769	.25	***	1.809	.31		2.369	.31	**	1.310	.20	
Talked to others with similar problems	1.867	.23	**	.883	.17		1.499	.19	*	.473	.24	**	.803	.25		1.698	.18	**
Social support	.809	.19		.901	.13		.810	.16		1.114	.19		1.002	.21		.899	.14	
Friends pursued treatment	1.308	.24		1.148	.16		1.298	.20		.878	.24		.993	.25		1.131	.18	
Partner encouraged treatment	.588	.31		3.648	.20	***	3.594	.23	***	6.201	.31	***	6.111	.31	***	.985	.20	
Family/friends encouraged treat	1.307	.29		2.133	.19	***	1.149	.23		1.633	.28		.879	.29		.539	.20	**
χ^2	840.13		81(df)	***														

N = 1352 Subsample of women from the National Survey of Fertility Barriers.

Pseudo r^2 (Cragg and Uhler's) .500

OR = Odds ratio

SE = Standard error

* $p < .05$; ** $p < .01$; *** $p < .001$

both types of health-seeking compared to doing nothing and also with being more likely to do both types of health-seeking compared to going online only. Talking to others who had a similar problem was associated with doing some type of Internet health-seeking. It is possible that women met others who sought in-person treatment through online searching.

Discussion

Seeking health-related information online is growing in popularity in the United States (Fox, 2008); yet we know of no studies that have examined online and in-person health-seeking simultaneously. It is important to understand the full range of health-seeking behaviors among infertile women. Use of online health-seeking is likely to increase as mobile devices become more common (Fox, 2010) and as self-education among health consumers comes to play a larger role in doctor-patient interactions and in the treatment decision-making process. Because few population-based studies have measures of both online and in-person health-seeking for the same health condition, our study provides valuable information. We find that faith in medical science, perceived stigma, symptom salience, resources and social network encouragement all play a role

in predicting the types of health-seeking behaviors in which women with fertility barriers engage.

We were surprised that so few women (9%) had searched for information online only. Because many more women had both searched online and talked to a doctor in-person about infertility, we see Internet health-seeking as primarily a supplement to going to a doctor. We do not have detailed time-order data to determine whether women go online first to determine if they need a doctor or go online after talking to a doctor to better understand their situation and options. Our findings are consistent with the idea that some women use the Internet to avoid a potentially stigmatized "infertile" label (Bunting & Boivin, 2007), but more do both than go online only. Therefore the desire for medical help seems stronger than the desire to avoid stigma. It is also possible that some women use the Internet to communicate with their doctors, but we do not have the data to determine how many do this.

As expected, we found positive associations between favorable attitudes toward medical science and higher perceived infertility stigma with going online for infertility-related health information. As Chrisman's (1977) model would suggest, women who perceived the symptoms of infertility as more salient had higher odds of using both health-seeking strategies

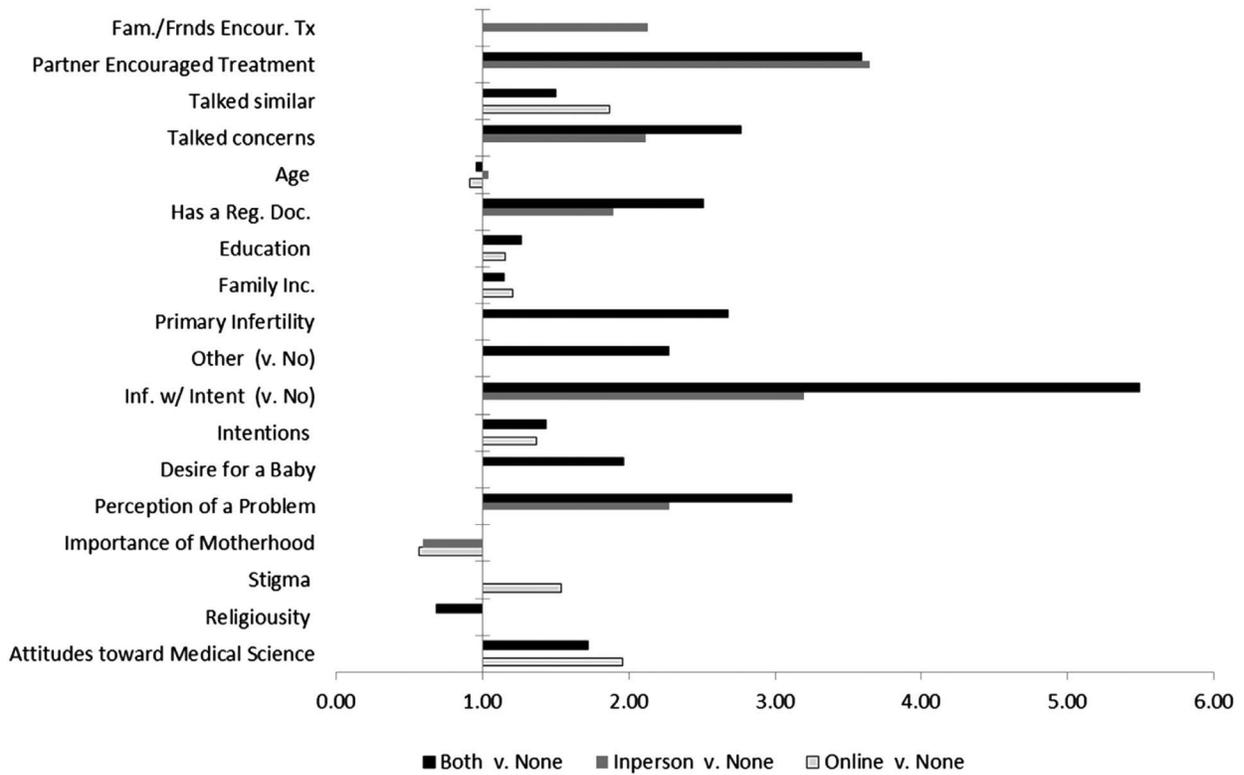


Fig. 1. Odds ratios for type of health-seeking (vs. no health-seeking) (showing variables that were significant).

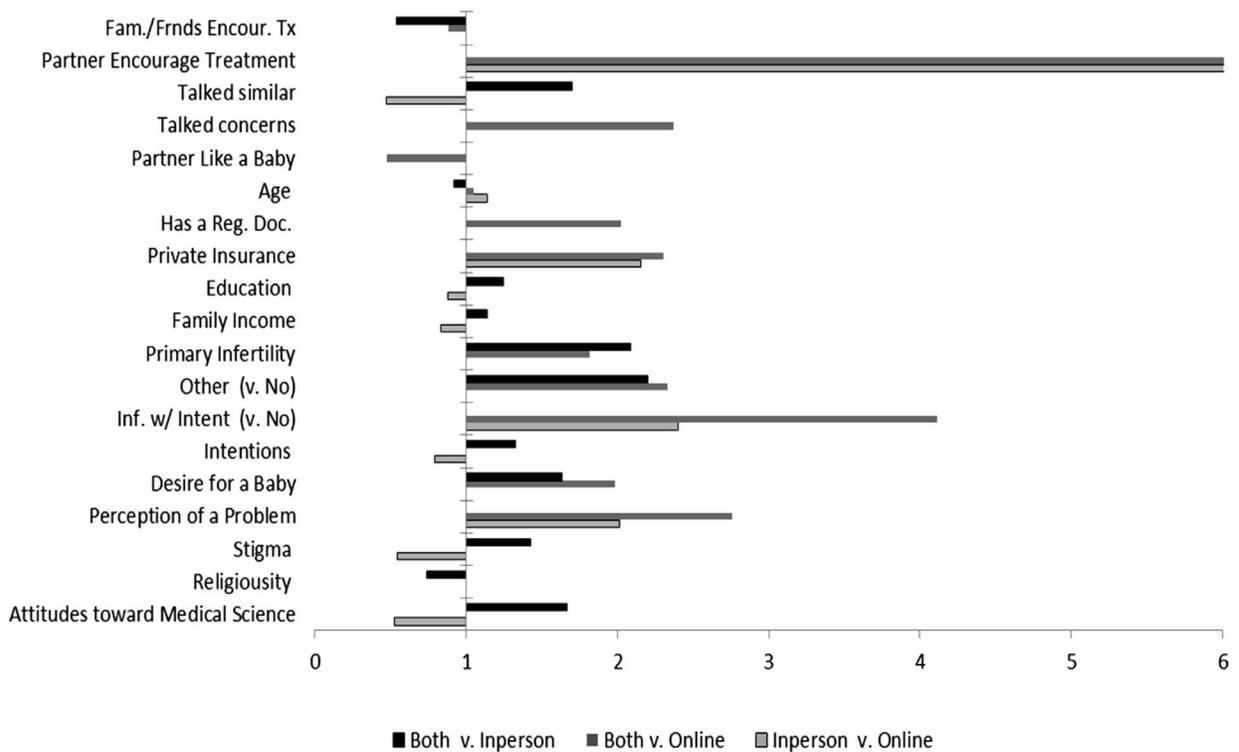


Fig. 2. Odds ratios for type of health-seeking (both, online or in-person) (showing variables that were significant).

and of engaging in in-person health-seeking compared to online health-seeking only. Women with greater resources had higher odds of using online sources of information. Strong social network encouragement to seek treatment was associated with in-person health-seeking and the use of both health-seeking

modalities as opposed to online health-seeking only or no health-seeking.

Future research should address the limitations of this study. First, data that follows women month by month from first suspecting a problem to post-reproductive years would

better reveal health-seeking pathways. With our cross-sectional data, we cannot ascertain causal order; we do not know, for example, whether Internet searching usually precedes or follows talking to a doctor among women who do both. It is particularly important to know if the women who went online only will eventually talk to a doctor or if they were dissuaded from talking to a doctor after searching the Internet.

A key limitation in this study is lack of information about the amount or type of Internet access these women had. These two factors have been associated with online health information-seeking (Fox & Jones, 2009). Ideally, we would have had information about men's health-seeking behaviors as well because infertility is often experienced as a couple rather than as an individual problem. Among women who said that they did not go online, it is possible that their partners went online for them.

Despite these limitations, this study makes important contributions to both research on medical health-seeking in general and infertility health-seeking in particular. First, we find that adding online information seeking to in-person health-seeking adds a more complete picture of behavioral responses to a chronic condition such as infertility. Second, we find that concepts suggested by Chrisman's Health-Seeking Model help to illuminate differences between online and in-person health-seeking. Third, we find that only a small percentage of women go online only to find information about infertility; therefore, online health-seeking should be understood as a complement rather than as an alternative to in-person health-seeking. Fourth, we find that of those who seek medical help for infertility, about half seek information online (although many of these women also talked to a doctor). Therefore, the Internet is an important area to explore for those interested in responses to infertility and other health conditions. We anticipate that future studies of health-seeking will incorporate online health behaviors as a possible option among several other health choices.

Appendix A. Supplementary data related to this article follows the References.

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Supplementary Table: Descriptive Statistics of Type of Health-Seeking and Independent Variables

Type of Help Seeking	% or M	SD
No Seeking	33.93	
Internet Only	9.31	
Medical Only	32.13	
Both Internet and Medical	24.63	
Individual Characteristics		
Internal Medical Locus of Control	2.97	0.50
Attitudes Towards Medical Science	3.36	0.41
Religiosity	0.05	0.66
Infertility Stigma	2.73	0.52
Importance of Motherhood	3.35	0.51
Age	36.06	5.91
In a Relationship	70.28	
Symptom Salience		
Perception of a Problem	69.00	
Desire for a Baby	33.33	
Intentions	-0.60	1.29
Infertile with Intent		
Infertile, No Intent	19.87	
Infertile, Intent to get Pregnant	63.58	
Other Fertility Barrier	16.54	
Primary Infertility		
Resources		
Family Income (1k Units)	53.48	32.20
Education (Years)	13.60	2.89
Private Health Insurance	66.43	
Has a Regular Doctor	84.63	
Race		
White	61.54	
African American	14.84	
Hispanic	15.53	
Asian	7.20	
Other	0.89	
Social Network Factors		
Partner Would Like a(nother) Baby	24.63	
Children Important to Partner	34.84	
Children Important to Parents	27.64	
Talked to Others about Fertility Problem	22.81	
Talked to Others with Similar Problems	44.69	
Friends Pursued Treatment	51.52	
Partner Encouraged Treatment	37.21	
Family/Friends Encouraged Treatment	35.12	

Note: N = 1.352 Subsample of women ages 25-45 from the National Survey of Fertility Barriers.