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James R. Wolf
Illinois State University, jrwolf@ilstu.edu

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A Preliminary Investigation into the Effects of Physician Email on Patient Perceived Quality of Care

James R. Wolf
School of Information Technology
Illinois State University
jrwolf@ilstu.edu

ABSTRACT

Several studies suggest that patients want the ability to communicate electronically with their physicians and that electronic communication can facilitate patient-centered care. However, to date, despite patient demand and a myriad of possible benefits, most physicians have resisted providing this option. This work is a preliminary investigation into the effects of electronic physician-to-patient communication on the quality of patient care. The study uses secondary data from an online physician-rating site to compare the quality ratings of physicians, from every specialty, from the state of Illinois. Our results suggest that a doctor's use of email increases patient perceptions of the quality of care they receive.

Keywords

Health Information Technology (HIT), physician adoption of email, quality of care, online physician-rating sites.

INTRODUCTION

Recent research has shown that the vast majority of Americans want the ability to email their doctors and that many would be willing to pay for this service (Bergmo and Wangberg, 2007; Couchman, Forjuoh, and Rascoe, 2001; Roter, Larson, Sands, Ford, and Houston, 2008). After all, 91% of Americans use email and 83% use the Internet to gather health related information (Baer, 2011). Intuit Health's *Health Care Check-Up Survey* reported that 29 percent of those 50 and older, and 59% of younger respondents, said they would switch doctors if they could use email (Intuit, 2011). However, to date, doctors have been reluctant to email their patients (Baker, Wagner, Singer, and Bundorf, 2003; Byrne, Elliott, and Firek, 2009). Even among health care providers who use email with patients, most only use it for a small fraction of their patients (Brooks and Menachemi, 2006).

LITERATURE REVIEW

Effective physician-to-patients communications has been linked to several positive health outcomes including improved treatment adherence, reduced anxiety and overall wellbeing (Andreassen, 2011; Haskard Zolnierek and DiMatteo, 2009; Kerse et al., 2004). Email has been shown to improve physician-to-patients communications and increase both patients and physician satisfaction (Ye, Rust, Fry-Johnson, and Strothers, 2010). Physicians who have incorporated email into their practice report that emailing patients saves time and reduces both patient phone calls and office visits (Houston, Sands, Nash, and Ford, 2003). More importantly, Houston et al. (2003) reports that early adopters feel that email has improved the quality of care they provided.

As Groopman (2007), notes asking and answering questions from you doctor is the best way a patient can reduce medical errors and improve your doctor's diagnosis. This is important because medical errors are the fourth leading cause of death for Americans. According to the Institute of Medicine, nearly 100,000 people die each year due to errors in diagnosis and other preventable medical errors (Kohn and Corrigan, 2000). Overall, 15% of all patients, regardless of medical setting, are misdiagnosed (Groopman, 2007). As a result of extensive medical misdiagnosis, millions of Americas are currently being treated for illnesses they do not have, while their actual conditions remain untreated (Ayers, 2007).

Email Facilitates Patient-Centered Care

As the Agency for Healthcare Research and Quality's (AHRQ's) website notes "*Talking with your doctor builds trust and leads to better results, quality, safety, and satisfaction*" (AHRQ, 2012). The idea behind AHRQ's TV ads are to encourage

people to talk to their doctor. However, during an office visit, patients may feel too rushed, too intimidated, or simply too embarrassed to ask their physician questions. In addition, their doctor may not allow them time to ask questions. Research suggests that doctors interrupt their patients after only 23 seconds (Marvel, Epstein, Beckman, 4, 1999). Beckman and Frankel (1984) note that one consequence of interruptions is the loss of patient information. Kaplan, Greenfield, and Ware (1989) report that only 15 percent of patients fully understand their doctors' instructions, and half leave the doctor's office uncertain of what they are supposed to do to take care of themselves.

Often, patients are more comfortable "speaking to the computer" then they are talking to their physician or pharmacist (Roter et al., 2008). Email's physical distance makes it easier for some patients to share embarrassing or distressing information with their doctor. As a result, patients are more likely to share potentially lifesaving information with their physician. Making more information available to the clinician will result in more accurate diagnostic decisions. In addition, the more information available to the patient, the better decisions they will make about treatment options and lifestyle choices.

Reasons Physicians Do Not Use Email

There are several reasons physicians are not utilizing electronic communication to correspond with patients. For one, physicians are typically not compensated for the time spent emailing their patients (Weiss and Gordon, 2011). Next, many doctors fear that using email with their patients will dramatically increase their workload (Byrne, Elliott, and Firek, 2009). In addition, many are worried about privacy and legal issues. Many experts blame the cost of the Health Insurance Portability and Accountability Act of 1996 (HIPAA) compliance and the associated liability issues for the low level of e-mail adoption by physicians (Wallwiener, Wallwiener, Kansy, Seeger, and Rajab, 2009).

While physicians worry that patients would flood them with trivial questions, patients have other priorities. The want to use online communication to request prescription refills (90%), for non-urgent consultation (87%), to learn laboratory results (84%) and to make or cancel appointments (78%) (Couchman et al., 2001). Yoo, Henfridsson, and Lyytinen (2010) note that few physicians accepted phone calls in the early days of the telephone. Today, however, few physician offices could function without phone calls to and from patients.

Doctors are more comfortable with contacting patients via telephone than via email (Hassol, 2004). However, the telephone has several disadvantages for the physician. Recent research suggests that patients are often thwarted when attempting to contact their health care provider on the phone. Leong, Gingrich, Lewis, Mauger, and George (2005) report that patients are frustrated by long hold times and "phone tag." In addition, there are no records or documentation for most patient phone calls. This represents a large medicolegal liability and can often lead to successful malpractice suits (Sands, 2004). Email is self-documenting. If a patient forgets to write down information from a phone call, they must rely on their potentially faulty memory or call the doctor again (Ball and Lillis, 2001). With email, the patient can simply reread the message. Better still, they can reread the message at a time that is most convenient for the patient.

METHODS

Started in 2004, Ratemds.com was founded by one of the co-founders of Ratemyprofessors.com and Ratemyteachers.com, which allow students to provide feedback on their university professors and high school teachers (Tanne, 2008). Similarly, Ratemds.com allows American and Canadian patients to rate their interactions with their physicians.

Data

On RateMDs.com, patients rate their physicians on four scales: staff, punctuality, helpfulness, and knowledge. An additional measure – overall quality – is calculated as the mean of average knowledge and average helpfulness. Patients may also leave comments. Ratemds.com provides and updates all information about doctors on their site. This includes the physician's name, gender, specialty, the city and state where they practice, their hospital affiliation, whether or not they are accepting new patients, their phone number, which medical school they attended, the year they graduated, and one item which is crucial for our analysis – whether, or not, the physician answers e-mail.

Illinois Health Care Provider Data

In early November 2011, RateMDs.com had patient rating data for 9419 health care professionals from the state of Illinois. We collected rating and email usage data on each doctor. On RateMD.com, patients rate physicians on a scale of 1 to 5, with 5 being "the best." Among the 9419 doctors in our dataset, the average patient rating for overall quality was 3.91 (SD= 1.364). Of these online profiles, 734 (7.8%) identified whether, or not, the doctor answered patient emails. Of these, 307 (41%) indicated that they do answer email and 427 (59%) indicated that they do not. Illinois doctors who answered patient

email, the average patient rating for overall quality was 4.513 (95% CI, 4.418, 4.4.608, SD=0.847). For those physicians who did not answer email, the average overall quality rating was 3.539 (95% CI, 3.420, 3.658, SD= 1.247).

A simple t-test suggests that the differences in patient-rated overall quality for physicians who answer email, and those who do not, is significant; $t(732)=11.856$, $p<0.001$. Specifically, our results suggest that a doctor's use of email increases patient perceptions of the quality of care they receive. To further test this premise, we performed robust regression analysis using data from the 734 Illinois doctors whose the profile indicated whether, or not, they answered emails. The model follows,

$$(1)\quad \textit{Average Rating} = \beta_1 * \textit{Number of Ratings} + \beta_2 * \textit{Emails Patients} + \beta_3 * \textit{Experience} + \beta 4 * \textit{Days Since Last Rating} + \beta_5 * \textit{Emails Patients} * \sum^{1\text{-}27} (\beta_{6\text{-}32} * \textit{Specialty}_{1\text{-}27}) + \varepsilon$$

where *Average Rating* is the dependent variable. It denotes the average patient provided quality rating for each Illinois physician. *Emails Patients* is the independent variable and a dummy variable set to one if the physician answers patient email and zero otherwise. *Number of Ratings, Experience, Days Since Last Rating* are each control variables. *Number of Ratings* denotes the number of patient ratings a physician has on RateMDs.com. *Experience* is the number of years since the physician graduated medical school, and *Days Since Last Rating* denotes the age (in days) of the last patient rating.

Results

	(1) Average Rating	(2) Average Rating
Number of Ratings	-0.032	-0.033
	(2.86)**	(2.98)**
Emails Patients	0.585	0.610
	(6.16)**	(6.51)**
Experience	-0.010	-0.010
	(2.17)*	(2.25)*
Last Rating (Days)	0.000	0.000
	(3.51)**	(3.21)**
Orthodontist		-1.389
		(2.14)*
Dermatologist		-0.750
		(2.70)**
Constant	4.142	4.191
	(24.69)**	(25.23)**
Observations	412	412

Absolute value of z-statistics in parentheses
* significant at 5% level; ** significant at 1% level

Table 1. Robust Regressions on Average Rating

As Table 1 shows, our preliminary data analysis suggests that patient-provided the quality of care (i.e., average rating) is higher for doctors who answer patient email. Our data also suggests that number of ratings has a negative effect on the average rating as does the physician's years of experience. The age of the rating has a positive effect. Lastly, of the 34 specialties in our data set, only the ratings of Orthodontists and Dermatologists differed significantly from the others. The effects are the same whether inserted in the full model (with dummy variables for each specialty) or in our reduced (model 2). Gender had no effect in any of our models, so it was omitted from our analysis. Space limitations preclude reporting additional analysis.

CONCLUSION

Our findings a partial insight into our research question. Our findings suggests that physicians should give patients what they what – email access.

While this work examined one form of electronic communication, email, the results are likely generalizable to other forms of electronic communication including the Web-based communications facilitated in many of the latest HIT systems.

Asynchronous online communication systems provide physicians and patients with the benefits of email, but without the security and privacy issues.

One limitation of our study is that patients required Internet access to rate the physicians in our data set. As a result, it is more likely that only those patients with the Internet access would use physician online rating sites. In the past this would have limited the generalizability of our findings. However, in 2012, Internet usage is not longer limited to the affluent or technologically advanced. Today, 91% of Americans use email and 83% use the Internet to gather health related information (Baer, 2011).

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