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E-Health

Will use of patient portals help to educate and communicate with patients with diabetes?

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ABSTRACT

Objective: Chronic disease management can require daily attention, and increased levels of patient activation and engagement. We examined whether patients with diabetes perceive a greater benefit to having electronic access to their doctors' clinic notes compared to patients without diabetes. We hypothesized that easy electronic access to these notes may help patients with self-care by improving education and communication.

Methods: Survey of patients with and without diabetes in Massachusetts and Pennsylvania about perceptions of potential benefits and risks of reading their visit notes via an electronic patient information portal. Administrative data were used to identify patients with diabetes; we compared their perceptions to those of patients without diabetes.

Results: The majority of patients (both with and without diabetes) perceived a positive impact of using the portal. Patients with diabetes were significantly more likely to believe that having access to and reading their notes would help them take their medication better and take better care of themselves. **Conclusions:** Patients with chronic diseases such as diabetes might receive an even greater benefit from access to their doctors' notes than the general patient population.

Practice implications: Doctors should encourage their patients with diabetes (or other chronic diseases) to use patient portals.

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1. Introduction

"I learned to see diabetes as a challenge that I have to rise to each and every day." – Alex Reidy, patient with diabetes [1]

There are many barriers to self-care for patients with chronic diseases such as diabetes [2]. A myriad of interventions have been used to support patients' education and adherence to doctor recommendations for diet, exercise, and oral and injectable medications [3,4]. Patients with chronic medical problems are often asked to change longstanding behavioral patterns, and often must attend to complex medication schedules multiple times each day [5]. The breadth and complexity of instructions for disease management can be overwhelming for patients [6].

Previous studies have suggested that patient access to their online medical record portals improves patients' understanding of their own health and improves adherence to treatment recommendations [7–10]. Diabetes self-care requires ongoing patient education, behavior change and engagement with their providers; thus, we hypothesize that patients with chronic diseases such as diabetes will feel more positively about the opportunity to read their doctors' notes, compared to patients without diabetes. We had the opportunity to test this hypothesis using data from the OpenNotes study in which patients were surveyed about their perceptions of potential positive and negative aspects of reading their doctor's notes. In this brief report we compare the perceptions of patients with diabetes to those without regarding having access to their doctors' notes through an online patient portal.

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2. Methods

Patients were invited to complete a web-based survey at Beth Israel Deaconess Medical Center in Boston, Massachusetts and Geisinger Health Center in central Pennsylvania. The study population and survey content have been previously described in detail [7,11]. Patients were classified as having a diagnosis of diabetes if an International Classification of Diseases (ICD) code indicative of the disease (ICD9 code of 250 and all sub classifications; see electronic Appendix A) was noted in the medical records for the patient within the year prior to the baseline survey.

The survey queried demographic information as well as perceptions of the risks and benefits of viewing the doctor's notes. The perception items were captured using a four-point Likert scale (agree, somewhat agree, somewhat disagree and disagree), and dichotomized into agree/somewhat agree versus disagree/somewhat disagree for the analysis. We compared the perceptions of those with diabetes to those without diabetes using logistic regression. Demographic and utilization characteristics found to be statistically significant at $P < 0.05$ (age, sex, education, employment, study site, and the number of office visits in the 12 months following the survey responses) were adjusted for in multivariate analyses predicting perception outcomes. All statistical analyses were conducted using SAS software, version 9.4.

3. Results

Of the 21,275 patients who took the survey, 2,921 (14%) had a diagnosis of diabetes (Table 1). The majority of patients were age 50 or older, female, had obtained some college education, and employed. Compared to participants without diabetes the patients with diabetes were more likely to be older, male, less educated,

unemployed or retired, and attended more clinic office visits in a year (all P-values < 0.05 , data not shown).

Patients with and also without diabetes were positive about potential benefits of having access to their doctor's notes with few concerns (Fig. 1). Patients with diabetes had consistently higher positive perceptions of OpenNotes than patients without diabetes (Fig. 1a) and also had lower or similar perceptions about the risks (Fig. 1b). Given that patients in both groups had very positive perceptions and the study population was quite large, the statistical significance noted for the differences between groups for most of the survey questions needs to be considered cautiously. However, the responses of the patients with diabetes compared to the patients without diabetes were statistically significantly different at $p < 0.001$ for three questions that asked: *If I could read my doctor's visit notes: I would feel more in control of my health care* (95% vs 92%, respectively), *I would take better care of myself* (93% vs 88%, respectively), and *I would be more likely to take my medications as prescribed* (82% vs 77%, respectively).

Patient perceptions of the positive impact of reading physician's notes about their health varied by patient characteristics (Table 1). Patients were more likely to report that OpenNotes would help them take their medications and take better care of themselves if they were greater than 50 years of age, had a high school education or less, were unemployed or retired, from the Geisinger Health System and were more frequently connected with the clinic (as measured by the number of office visits in the 12 months following the survey). All of these patient characteristics were statistically significantly associated a $p < 0.05$ with the exception of age and "I would take medication better" ($P = 0.09$) (Table 1).

In logistic regression analyses adjusted for characteristics listed in Table 1, patients with diabetes were still statistically significantly more likely to perceive a benefit from reading their doctor's notes compared with patients without diabetes. Patients with

Table 1
 Odds ratios (95% confidence interval) estimating impact of patient characteristics on perceptions that reading physician notes would allow them to take their medication better and take better care of themselves (N = 21,275).

	N (%)	Take medication better ^a	Take better care of self ^a
Age			
<50	7806 (37%)	1	1
50+	13469 (63%)	1.06 (0.99, 1.13)	1.22 (1.11, 1.33)
Sex			
Male	8146 (38%)	1	1
Female	13129 (62%)	1.16 (1.08, 1.24)	0.78 (0.71, 0.86)
Education			
High school/GED or less	5803 (27%)	1	1
Some college	6437 (30%)	0.66 (0.60, 0.73)	0.57 (0.50, 0.65)
College graduate	3542 (17%)	0.44 (0.39, 0.49)	0.41 (0.35, 0.47)
Post college	5493 (26%)	0.34 (0.31, 0.38)	0.31 (0.27, 0.35)
Employed			
Employed/self-employed/homemaker	15031 (71%)	1	1
Unemployed/unable to work	1613 (8%)	1.89 (1.63, 2.18)	1.83 (1.50, 2.22)
Retired	4631 (22%)	1.25 (1.15, 1.36)	1.41 (1.26, 1.58)
Study site			
Geisinger Health System	17403 (82%)	1	1
Beth Israel Deaconess Medical Center	3872 (18%)	0.49 (0.45, 0.52)	0.51 (0.46, 0.56)
Office visits in 12 months following survey			
No visits	2418 (11%)	1	1
1–2	9036 (42%)	0.96 (0.87, 1.07)	1.11 (0.97, 1.26)
3–4	5852 (28%)	1.15 (1.03, 1.29)	1.33 (1.15, 1.54)
5+	3969 (19%)	1.57 (1.38, 1.77)	1.84 (1.56, 2.17)
Diabetes diagnosis (unadjusted)			
No	18354 (86%)	1	1
Yes	2921 (14%)	1.37 (1.24, 1.52)	1.84 (1.58, 2.14)
Diabetes diagnosis (adjusted)^b			
No		1	1
Yes		1.16 (1.04, 1.29)	1.43 (1.22, 1.67)

^a Odds ratio and confidence interval estimates produced by logistic regression.

^b Odds ratio for diabetes diagnosis after adjusting for age, sex, education, employment, study site, and the number of office visits in the 12 months following the survey responses.

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