

Do Health Care Users Think Electronic Health Records Are Important for Themselves and Their Providers?

Exploring Group Differences in a National Survey

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Abstract

Patient access to electronic health records (EHR) is expected to have a variety of benefits, including enhanced patient involvement in care and access to health information, yet little is known about potential demand. We used the 2007 Health Information and National Trends Survey, a national probability-based survey, to determine which health care users with Internet access are likely to report that electronic access to their health records is important for themselves and their providers. Respondents who represent populations that generally experience health and healthcare disparities (Blacks, Latina/os, and patients with psychological distress) were among the most likely to report that the EHR was very important for them, even after controlling for respondents' socio-economic status, health status, health care context, and disposition toward health information. Health policies and the designs of EHRs should consider these patterns, which may help address health and health care disparities.

Introduction

In its landmark 2001 report, *Crossing the Quality Chasm*, The Institute of Medicine¹ suggested that a health care system redesigned around patient-centered care that fosters more continuous patient-provider relationships would promote better health outcomes. More recently, the National Healthy People 2020 objectives recommend using “health communication strategies and health information technology to improve population health outcomes and health care quality, and to achieve health equity”². An expanding body of empirical evidence documents an association between electronic access to health information and improved health knowledge, attitudes, and behavior among patients³⁻⁵.

Population-based surveys and other research suggest that patients desire online access to their medical records and e-mail communication with clinicians^{6,7}. According to a 2011 study by the Pew Research Center, 27% of U.S. adult Internet users have tracked personal health information online, including information such as weight, exercise, and other health indicators and symptoms⁸. This interest has translated into observable changes in care. New information technologies that enable electronic access to health information and medical records appear to support more active patient involvement in their own care and facilitate enhanced communication between patients and care givers^{7,9-11}. Patients who discuss online health information with their providers perceive benefits such as more confidence and control over their care during the encounter¹². A recent large-scale study of patients in select practices who had online access to medical records indicates patients perceive multiple benefits, including better understanding and enhanced control over their health and health care⁹.

While such cohort studies offer important findings about current patients who are provided with electronic access to clinical information, they do not tell us how groups who may not yet have access to such technologies evaluate their importance. Disparities in health care access exist across socio-demographic groups, particularly by race/ethnicity^{13,14} and among those who present themselves with some form of psychological distress¹⁵⁻¹⁷. It is not clear whether new technologies will replicate existing disparities in health care, or whether they offer the potential to reduce disparities by creating an alternative way to access certain aspects of health care, particularly health information. Electronic access to health records outside of a regular health care visit can provide both general health information and patient-specific information, such as access to test results or medication information, which may ameliorate disparities.

Initial findings in the literature suggest that electronic access to health information may in fact help address disparities. Wen and colleagues¹⁸ used the 2007 Health Information and National Trends Survey (HINTS) data to show overall that Hispanics, respondents younger than 65 years of age, and Internet users all were more likely to rate electronic access to their health records as important. They found that the doctor-patient relationship also mattered in that individuals whose doctors always ensured their understanding of their health were less likely to see electronic access as important. In a study of Israeli society, Mesch and colleagues¹⁹ found that disadvantaged groups were more motivated to use to access medical information electronically, suggesting the potential to expand access to under-resourced groups.

In this paper we examine how socio-demographic factors, particularly race/ethnicity and gender, as well as health status and health care context are associated with views of electronic health records. Findings of group differences in opinions about the importance of electronic access may help shed light on whether these new technologies will further exacerbate health care disparities, or alternatively, whether they may provide a tool to expand access to care.

Methods

We address the limitations of previous studies with data from a national survey. The Health Information National Trends Survey (HINTS) is a population-based survey of non-institutionalized U.S. adults conducted by the National Cancer Institute (N=7674). The field period for the 2007 iteration of HINTS used in this analysis was January through April of 2008. Respondents were recruited using one of two sampling frames: random digit-dialing (RDD, N=4092) and random sample of U.S. addresses (N=3582). With few exceptions, the latter completed a mail-in paper survey and the former completed a telephone survey. Responses were weighted based on the sampling frame used, a nonresponse adjustment, and a calibration adjustment for known population totals. Data included in the analysis came from both sampling frames.

Survey procedures have been described elsewhere²⁰. The 2007 HINTS is a publicly available data set with no respondent identifiers; therefore, this study was exempt from review by the institutional review board of Dartmouth College.

Our analytic sample ($n = 3,320$) is composed of respondents with internet access who reported making one non-emergency room visits in the 12 months prior to the survey. We established Internet access based on the item, "Do you ever go on-line to access the Internet or World Wide Web, or to send and receive e-mail?" We determined who made a non-emergency room visit with the item, "During the past 12 months, not counting times you went to an emergency room, how many times did you go to a doctor, nurse, or other health professional to get care for yourself?"

The two outcomes of interest were respondents' perceived importance of the EHR for themselves and their providers. We measured the degree to which respondents believed that EHRs are important for themselves with the item, "How important would it be for you to get your own medical information electronically?" Three response categories were offered, which we dichotomized into a binary variable (1 = "very important," 0 = "somewhat important," or "not at all important"). Perceived importance of the EHR for their providers was measured with the item, "How important is it to you that your healthcare providers are able to share your medical information with each other electronically?" Response categories and our coding for this second outcome were similar to the first.

Our independent variables of interest reflect our primary concern with associations between our outcome and indicators that reflect the respondents' likelihood of experiencing a disparity in health care. In particular, our interest in disparities experienced because of respondents' race and ethnicity and psychological distress. We measured race and ethnicity with a categorical variable (white, black, Latina/o). Psychological distress was measured as the average of the Kessler-6 non-specific psychological distress scale²¹. The scale asked respondents for the frequency in the past 30 days that they experienced six manifestations of psychological distress (nervous, hopeless, restless or fidgety, so sad or depressed nothing could cheer respondent up, feeling that everything is an effort, and worthless). For each manifestation, frequency is measured on a 5-point scale (0 = "None of the time," 4 = "All of the time").

Our models control for respondents' socioeconomic status and demographic background. We generated measures for respondents' gender (1 = female, 0 = male), age (years), education level completed (high school or less (referent), some college, college, graduate), health insurance status (1 = has health insurance, 0 = does not have health insurance), employment status (1 = currently employed, 0 = not currently employed), marital status (1 = currently married; 0 = not currently married), and annual household income (less than \$20,000 (referent); \$20,000-34,999; \$35,000-49,999; \$50,000-74,999; greater than or equal to \$75,000).

Additional controls captured the respondents' health and health care context. Self-rated health is measured on a five-point Likert scale that we coded so that higher values indicated better health (1 = "Poor," 5 = "Excellent"). Having a regular provider was determined with the item, "Not including psychiatrists and other mental health professionals, is there a particular doctor, nurse, or other health professional that you see most often?" (1 = Yes, 0 = No). We included the respondent's perception of the quality of care received in the 12 months prior to the survey on a five-point Likert scale that we coded so that higher values indicated greater quality (1 = "Poor," 5 = "Excellent"). We created a three category nominal variable that reflected whether the respondent knew if their provider offered an EHR (no (referent), yes, don't know).

Lastly, we also included controls for respondents' disposition toward health information, particularly in electronic form. We assessed whether the respondents ever sought health information (1 = yes, 0 = no), their degree of trust in a medical provider as a source of health information (1 = "Not at all," 4 = "A lot"), their confidence in health information-seeking (1 = "Not at all confident," 5 = "Completely confident), and the degree to which they agreed that their health information was safely guarded (1 = "Strongly disagree," 4 = "Strongly agree"). Many of these responses, as well as those that capture the respondent's perception of the healthcare context, may be shaped by the respondent's perceived agency in caring for him- or herself. As such, we included a five-point Likert measure to control for the respondent's perceived confidence in self-care, with higher values coded to reflect greater confidence (1 = "Not at all confident," 5 = "Completely confident").

In a preliminary analysis not shown, we found the sampling frame used during survey data collection was significantly related to the outcome variables. We included a binary variable in the multivariate analysis to account for sampling frame and included combined (RDD and address) sampling weights²⁰. Analyses were conducted using STATA SE version 12.0, and survey (svy) commands were used to account for the complex design.

Nested binary logistic regression models were used to determine the relationship between measures of socio-demographic characteristics, health status and health care utilization on the respondents' likelihood of perceiving an EHR to be very important

for themselves, and for their providers. We further explore whether respondents' disposition to health information measures alter the relationships between socio-demographics, health status, health utilization and attitudes. Results are presented as odds ratios (OR). We used two-tailed significance tests.

Results

As can be seen in Table 1, approximately half of the sample believed that an EHR is very important (vs. somewhat or not at all important) for themselves. Given that we restricted the sample to Internet users who made a health care visit in the 12 months prior to the survey, the sociodemographic profile of the analytic sample is as expected. Close to three-quarters of the sample has completed at least some college. 42% of the sample reported an annual household income of at least \$50,000. The majority of the sample is White (81%), has some form of health insurance (90%), and has a usual source of care (79%).

Table 1. Weighted Descriptives for Study Measures

Measure	M	SD
Perceives EHR is "very important" for self	.54	-
Perceives EHR is "very important" for providers	.48	
Female	.54	-
Has health insurance	.90	-
Education level completed		
<=High school (referent)	.27	-
Some college	.39	-
College	.22	-
Graduate	.12	-
Age (years)	42.43	15.26
Currently employed	.67	-
Annual household income		
<\$20,000 (referent)	.21	-
\$20,000-34,999	.14	-
\$35,000-49,999	.22	-
\$50,000-74,999	.16	-
>=\$75,000	.26	-
Currently married	.59	-
Race/ethnicity		
White (referent)	.81	-
Latina/o	.10	-
Black	.09	-
Self-rated health (1-5)	3.51	.89
Avg. psychological distress	1.79	.70
Has usual source of care	.79	-
Quality of care (1-5)	3.96	.96
Provider offers EHR		
No (referent)	.27	-
Yes	.57	-
Don't know	.16	-
Ever sought health information	.85	-
Confidence in health information-seeking (1-5)	3.83	.93

Measure	M	SD
Confidence in self-care (1-5)	3.89	.79
Trust provider as health information source (1-5)	3.71	.53
Agrees that health information is safely guarded (1-4)	3.26	.70

SOURCE: 2007 HINTS

The odds ratios in Table 2 show that across all three nested models, blacks and Latina/os are significantly more likely to perceive the EHR as very important for themselves than whites. The significant associations remain even after adjusting the estimates for respondents' socio-demographic background, health status, health care context, and disposition toward health information.

We added indicators of respondents' health status, including their average psychological distress, in Model 2. The addition of these variables increased the significant difference in odds between black and white respondents and also caused respondents who are currently married to be statistically equivalent to those who are not married. As a respondent's average psychological distress increases, so do their odds of perceiving the EHR to be important for themselves. The statistical significance of this association decreases slightly in Model 3, where we introduced adjustments for respondents' disposition toward health information. Most of the change in significance of the OR for psychological distress is due to ratings of quality of care, which is why this coefficient is not introduced until Model 3. Prior research suggests that psychological distress is negatively related to ratings of quality of care, which explains the patterns observed here¹⁵⁻¹⁷. Taken together, the results shown in Table 2 suggest the potential strength of these technologies in addressing health and health care disparities, which we revisit this finding in the discussion.

Table 2. Odds Ratios from Binary Logistic Regression Predicting Respondents' Perception that EHR is "Very Important" for Self

Variable	Model 1	Model 2	Model 3
Female	.837	.830	.807*
Race/ethnicity (vs. White)			
Latina/o	1.557*	1.579*	1.618*
Black	1.722*	1.857**	1.794**
Education level completed (vs. <=high school)			
Some college	.897	.917	.807
College	.828	.862	.896
Graduate	.814	.822	.839
Age (in years)	1.042*	1.041*	1.042
Age^2	1.000*	1.000	1.000
Currently married	.777*	.802	.804
Self-rated health (1-5)		1.063	1.102
Avg. psychological distress		1.352**	1.287*
Has usual source of care		.751*	.772
Quality of care (1-5)			.809**
Provider offers EHR (vs. no)			
Yes			1.67***
Don't know			.962
Ever sought health information			1.229
Confidence in health information-seeking (1-5)			1.002
Confidence in self-care (1-5)			1.033
Trust provider as health information source (1-4)			.938
Agrees that health information is safely guarded (1-4)			.946

SOURCE: 2007 HINTS. Odds ratios are presented with standard errors in parentheses. All models control for respondents' annual household income, health insurance status,

and employment status, none of which were statistically significant in any model.

Note: * p < .05; ** p < .01; *** p < .001.

We repeated the analysis for our second outcome, the perceived importance of EHRs for providers. As can be seen in Table 3, the patterns of statistical significance are different for this perception. Unlike in the analysis of the respondents' perceived importance of the EHR for themselves, gender is a significant predictor across the three models. Compared to men, women have lower odds of rating EHRs as "very important" for their providers. Only one of the non-white race groups has a significant OR, which only appeared after the inclusion of the controls for disposition toward health information in Model 3. Compared to whites, Latina/os have a significantly higher odds of perceiving EHRs as "very important" for their providers. Besides age, no other demographic variable has a significant association with our outcome.

Table 3. Odds Ratios from Binary Logistic Regression Predicting Respondents' Perception that EHR is "Very Important" for Providers

Variable	Model 1	Model 2	Model 3
Female	.693**	.692**	.660***
Race/ethnicity (vs. White)			
Latina/o	1.417	1.424	1.535*
Black	1.130	1.142	1.180
Education level completed (vs. <=high school)			
Some college	.802	.804	.801
College	.972	.979	.986
Graduate	.987	.984	1.010
Age (in years)	1.042	1.042	1.056**
Age^2	1.000	1.000	1.000
Currently married	.906	.913	.913
Self-rated health (1-5)		1.041	1.043
Avg. psychological distress		1.076	1.111
Has usual source of care		.943	.870
Quality of care (1-5)			.970
Provider offers EMR (vs. no)			
Yes			.448***
Don't know			.570**
Ever sought health information			1.198
Confidence in health information-seeking (1-5)			1.090
Confidence in self-care (1-5)			.930
Trust provider as health information source (1-4)			.936
Agrees that health information is safely guarded (1-4)			1.436***

SOURCE: 2007 HINTS. Odds ratios are presented with standard errors in parentheses.

All three models control for respondent's annual household income, health insurance status, and employment status, none of which were statistically significant in any model.

Note: * p < .05; ** p < .01; *** p < .001.

It is notable that compared to respondents who report that their provider does not currently offer an EHR, those who report that their provider does or cannot recall have significantly lower odds of perceiving EHRs as "very important" for their providers. Those who report that their provider currently offers an EHR may be viewing redundancy when coming across this survey question. As for those who reported that they do not know whether their provider currently maintains an EHR, this suggests an opportunity to educate this segment of the population about potential benefits derived from these systems.

Discussion

We examined the likelihood of perceiving an EHR to be very important in a national sample of Internet users who made at least one non-emergency room in the 12 months prior to the data collection. We found that racial and ethnic minorities were more likely to believe that an EHR was very important for themselves than whites. We also found that the respondents' average level of psychological distress is positively associated with this likelihood. Unexpectedly, we found women to have lower odds of perceiving EHRs to be very important for their providers. In general, the patterns suggest the potential importance of the EHR in addressing health and health care disparities and considerations for health policy surrounding the EHR.

The statistically significant racial and ethnic differences were robust to the systematic introduction of controls in the nested models. Previous research on racial and ethnic disparities in health and healthcare has shown that these disparities often remain after the inclusion of measures that reflect an individual's socio-economic position or health status²². The fact that the association between being a racial and ethnic minority and believing that an EHR was important remained stable to controls introduced in successive models speaks to the potentially key role that an EHR could play in addressing disparities. However, the early findings among some cohorts of patients that minorities are less likely to use patient portals, for example, suggest that there are barriers to use other than patient attitudes about these tools.

The finding that psychological distress is related to believing an EHR is important also speaks to source of health care disparity. Individuals who present themselves with serious psychological distress often report experience poorer patient-provider communication than those who do not¹⁶. This is consistent with the slight decrease in statistical significance in the coefficient for average psychological distress when quality of care was introduced in Model 3. As is the case for racial and ethnic minorities, this suggests that patients who are likely to experience poor health care because of their psychological distress may benefit from the use of an EHR.

Unexpectedly, we found women to have lower odds of reporting EHRs to be very important for their providers. This finding appeared in our simplest model and remained as we adjusted estimates for respondents' health status, health care context, and disposition toward health information. This eliminates potential confounding factors such as women's general better health than men^{23, 24}. The finding can be framed in two ways: when it comes to viewing these technologies as critical to their health care providers, either women have a lower propensity than men or men have a higher propensity than women. Given men's general propensity to adopt technologies at a faster rate than women²⁵, the latter may be the case. Future research should adjudicate between these interpretations.

Policies surrounding patient education about how to use the EHR effectively would benefit from additional research that dissects the significant racial and ethnic group differences in believing an EHR to be very important. Race and ethnicity is an important distinction by which populations stratify on health and health care. It is unclear from these data whether the differences exist because racial and ethnic minorities are interested in using an EHR to substitute or enhance their existing care. We restricted our sample to those respondents who had made at least one health care visit in the 12 months prior to the visit, but we are unable to determine the relationship between the respondents' attitude toward the EHR and propensity to maintain adherence to suggested care management. Our initial thoughts on these relationships is that it would be enhancement and not substitution, because the inclusion of controls that are generally associated with patient adherence (ratings of quality of care received and trust in the provider as a source of health information) in the models did not change the significant racial and ethnic differences.

This study also has the following limitations. The survey design for HINTS is cross-sectional; therefore, definitive conclusions about causal associations are not appropriate. It is important to note that the direction and nature of the association between individual health and health care characteristics and importance of electronic access to health records cannot be determined from these data. Limitations are also inherent in the use of RDD telephone methods because of decreasing numbers of households with land-line telephones.

Conclusion

Health IT such as electronic health records are expected to improve patient engagement with their health and health care. For example, studies of patients in select practices find that electronic access to medical records enhance patient-provider communication and increase patient participation in their care^{9-10, 26}. While such research is promising, other studies among specific cohorts of patients find evidence of health and socio-economic disparities in enrollment and use of such tools²⁷⁻²⁹ suggesting that the benefits of health IT may not be evenly distributed across the population. Though such cohort studies offer important findings about patient use and perceptions of health IT, they do not tell us enough about the views of the population overall. Perceptions of the value of EHRs by some groups and not others may lead to different usage patterns that can cause inequality in the resources and skills created by technology use, i.e., the so-called "second-level digital divide"³⁰⁻³¹, which can exacerbate existing health disparities.

Major efforts by both health care providers and policy makers are currently being directed toward using health information technologies to improve health care and health outcomes. By identifying the characteristics of current health care users who see

electronic access to records as important for themselves and providers, we can better understand the needs of likely users, as well as the potential benefits of such tools, including what these new technologies may offer outside of the standard health care encounter.

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