Predictors of viewing progress notes among users of VA’s electronic health portal who receive mental health care

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Received 13 December 2017; Revised 14 March 2018; Accepted 17 March 2018

ABSTRACT

Objective: Consistent with the OpenNotes movement, the Veterans Health Administration (VHA) offers patients online access to their clinical notes through the Blue Button feature in its electronic patient health portal, My HealthVet. We identified demographic, diagnostic, and knowledge-related predictors of viewing clinical notes among veterans receiving VHA mental health care who recently used My HealthVet.

Materials and Methods: Three hundred and thirty-eight patients receiving mental health care from 1 VHA medical center who had logged into My HealthVet in the prior 6 months completed self-report questionnaires assessing their viewing of clinical notes. Additional data were extracted from VHA’s Patient Care Database. Multivariable logistic regression was used to examine predictors of viewing notes.

Results: Fifty percent of respondents reported having read their notes. In the final multivariable model, post-traumatic stress disorder (PTSD) diagnosis [odds ratio (OR) = 2.30 (1.31–4.07)], speaking with their mental health clinician about their ability to view notes [OR = 3.84 (1.69–8.72)], and being very or extremely confident in understanding the purpose and uses of Blue Button [OR = 9.80 (2.23–43.07) and OR = 13.36 (2.74–65.20), respectively] were associated with viewing notes.

Discussion: Patient recall of mental health clinicians speaking to them about their ability to view notes, and confidence in understanding the use and purposes of Blue Button, were stronger predictors of viewing notes than demographic variables. PTSD diagnosis was the only clinical characteristic associated with viewing notes.

Conclusion: The findings support the value of mental health clinicians openly discussing the availability of notes with patients if they wish to help them take advantage of their potential benefits.

Keywords: Health Information Technology, patient portals, mental health, self-care, veterans

BACKGROUND AND SIGNIFICANCE

To enhance transparency in health care, several health care systems across the United States (US), including the Veterans Health Administration (VHA), now offer patients OpenNotes: online access to their clinical notes. Clinical notes are progress notes that clinicians and other staff write in patients’ medical records to document health care contacts. Veterans enrolled in VHA can access OpenNotes using the Blue Button feature which is available through VHA’s patient portal, My HealthVet. Prior research suggests that patient access to progress notes may help facilitate patient engagement and strengthen the patient-clinician relationship.1,2 For example, in a multisite study of the impacts of OpenNotes, 77–87% of primary care patients reported feeling more in control of their care when given access to clinical notes.3
Although concerns have been raised about the potential negative consequences of patients reading their mental health notes, patients who receive mental health care may benefit from reading their mental health notes. In a recent qualitative study examining the impact of viewing notes online among mental health patients, findings indicated that reading mental health clinical notes can strengthen patients’ trust in their clinicians, improving the therapeutic relationship. Patients with mental health conditions may also experience unique benefits: in 1 study, patients with mental health conditions more frequently reported better care coordination and feeling less challenged or distracted during visits as a result of reading notes compared to patients without mental health conditions.

Despite these potential benefits, not all patients choose to read their notes, and it is unclear to what extent patients with various mental health conditions view their notes. Although over 4 million users have registered for My HealtheVet as of July 2017, only half use the Blue Button feature to read their notes. Patients with mental health conditions may be less likely to take advantage of the Blue Button than other patients—previous research suggests a gap between the proportion of patients with mental health conditions who wish to use web-based health resources and actual use of such resources. An improved understanding of which patients who are receiving mental health care and currently use My HealtheVet may be less likely to view their notes could inform initiatives to increase note viewing among patients with mental health conditions. The main objective of the current study was to identify demographic, clinical, and knowledge-related predictors of viewing notes via the Blue Button among a sample of patients enrolled in My HealtheVet and who receive VHA mental health care.

**MATERIALS AND METHODS**

**Setting**

VHA is the largest integrated health system in the US and has maintained an electronic medical record system since 1989. In 2003, VHA launched My HealtheVet, a secure patient portal enabling veterans to access their health information online. Using My HealtheVet, VHA patients can refill prescriptions, send secure messages to their health care team, and review upcoming appointments. Veteran access to clinical progress notes was made available in 2013 through My HealtheVet using the Blue Button feature, which enables users to download portions of their medical record. All clinical notes from 2013 onward are available for download, 3 days after notes are signed. VHA patients enrolled in My HealtheVet who wish to use the Blue Button feature must complete an additional form online.

We conducted this study at a large VHA medical center in the Pacific Northwest. This Medical Center provides comprehensive care to ~95,000 veterans at 11 urban and rural sites across the region. Nearly 200 mental health clinicians provide mental health services to ~16,000 unique veterans across a range of programs, including residential rehabilitation, substance abuse treatment, inpatient care, and recovery. The broader population of patients who receive mental health services at the medical center are white, non-Hispanic (82%), and male (88%), with an average age of 53. These patients are often diagnosed with post-traumatic stress disorder (PTSD) (28%), depression (26%), and substance use disorders (12%), while 9% have schizophrenia/bipolar spectrum disorders and 3% have personality disorders. Approximately half are authenticated My HealtheVet users. This study was reviewed and approved by the Institutional Review Board of the medical center where the study took place.

**Participants**

We recruited and enrolled participants between February and July of 2016. VHA patient care databases were used to identify potentially eligible participants. Veterans were eligible to participate if they had, in the 6 months prior to recruitment, (1) completed at least 1 in-person mental health appointment at the medical center; and (2) logged into VA’s electronic health portal, My HealtheVet, at least twice. Exclusion criteria included: International Classification of Diseases (ICD-9) dementia or cognitive disorder diagnoses recorded in the medical record in the prior year, or having a legal guardian. We employed a stratified recruitment strategy designed to enroll a diverse sample of patients in terms of diagnosis and mental health program involvement. Over a 6-month period, we mailed recruitment letters to 3381 potentially eligible patients (approximately one-fifth of the patients who receive mental health services within a year’s time), and 598 indicated interest in participating. After describing the study and confirming eligibility, 407 participants were consented and enrolled. All participants received written materials describing how to use Blue Button to access their clinical notes.

**Data sources and measures**

Most data used in the current analysis came from a baseline questionnaire which was administered as part of a longitudinal study that is examining veteran and clinician experiences with the OpenNotes initiative and impacts of web-based courses designed to educate patients and clinicians about OpenNotes. Participants could choose to complete questionnaires online or via paper and pencil. The overall questionnaire is designed to assess the use of, experiences with, and attitudes toward the viewing of clinical notes by veterans who receive mental health care; a number of the questionnaire items were adapted with permission from the Robert Wood Johnson Foundation’s OpenNotes project. The current study focused on several items assessing knowledge or awareness regarding accessing personal health information online: (1) confidence in understanding the purpose and uses of VA Blue Button (OpenNotes); (2) importance to health and recovery to have access to personal health information using VA Blue Button; and (3) whether the patient’s mental health clinician had ever talked with the patient about being able to access and read mental health notes using VA Blue Button. The questionnaire also included the eHealth Literacy Scale (eHEALS), an 8-item measure that assesses perceived capability to access health-related information using technology or web-based tools; scores range from 8 to 40, with higher scores representing higher self-perceived eHealth literacy. We also extracted prior-year psychiatric diagnosis and health care utilization data for the year prior to questionnaire administration from VHA’s Patient Care Database.

**Statistical analysis**

All statistical analyses were conducted using STATA v.14 (StataCorp. College Station, TX, USA). First, we assessed bivariate relationships using t-tests for continuous variables and Fisher’s exact tests for categorical variables. Next, using multivariable logistic regression, we examined associations between candidate predictor variables and veterans’ viewing of notes. Candidate predictor variables, based on a priori theory and the results of our formative qualitative work, included demographics, prior-year psychiatric diagnosis [classified as anxiety/panic; major depression; personality disorder; substance use disorder; or bipolar disorder, schizophrenia, or delusional disorder diagnosis (referred to here as psychotic/bipolar spectrum disorder diagnosis)], eHEALS score, and attitudes
related to OpenNotes. We used backward stepwise selection to build three parsimonious multivariable logistic regression models to estimate associations between candidate predictor variables and viewing notes. Alpha levels for model inclusion and exclusion were set at $P = .15$ and $P = .20$, respectively. Age and gender were forced into all models. We tested for confounders and interaction terms using the likelihood-ratio test. Model fit was assessed using tests for variance inflation factor, Hosmer–Lemeshow goodness-of-fit, Receiver Operating Characteristic (ROC), Akaike’s Information Criterion (AIC), and the identification of influential points.

RESULTS

Fourteen patients withdrew prior to receiving questionnaires, resulting in 393 (97%) participants who received questionnaires. Three hundred fifty-eight (88%) returned them, and 338 (83%) had complete sets of responses. There were no statistical differences in demographic information when comparing respondents to those who failed to return questionnaires. Demographically, participants were similar to the broader mental health patient population at the Medical Center: The average age of respondents was 57.8 (SD = 12.3); 80% were male; 56% were married; 89% were white; 70% were not working due to disability or retirement; 9% had a high school education or less; and 20% lived in rural areas. In the prior year, 58% of our sample had been given a diagnosis of PTSD, 60% had been given a depression diagnosis, and 17% had been given a psychotic/bipolar spectrum disorder diagnosis.

Fifty percent reported having ever read or downloaded their clinical notes through the My HealthVet portal, and 17% indicated that their mental health clinicians had spoken with them about being able to access and read their notes. Seventy-seven percent of those who had read their notes had done so within the prior 90 days. The mean eHEALS score was 28.5 (SD = 6.7). In bivariate analyses (Table 1), younger veterans (55.6 vs. 60.1; $P < .001$) and veterans with PTSD diagnoses (63.9% vs. 52.7%; $P = .047$) were significantly more likely to report having read their notes. Veterans who recalled that their mental health clinicians had spoken with them about being able to access their notes online through Blue Button were also significantly more likely to report having read their notes (83.4% vs. 16.6%; $P < .001$).

In the first regression model (Model 1), we examined relationships between demographic variables (gender, age, employment, education) and ever viewing notes. In the second regression model (Model 2), we examined relationships between Model 1 terms plus prior-year psychiatric diagnoses and ever viewing notes. In the third regression model (Model 3), we examined relationships between Model 2 terms plus several questionnaire responses (Table 2) and ever viewing notes.

Table 1. Demographic and clinical information for study population ($n = 338$)

| Value | Never read their notes ($n = 169$) | Ever read their notes ($n = 169$) | $P$-value |
|-------|----------------------------------|----------------------------------|-----------|
| Gender (% male) | 135 (80.0%) | 135 (79.9%) | 1.00 |
| Age | 60.1 ± 12.0 | 55.6 ± 12.2 | < .001 |
| Marital status | | | 0.83 |
| Married | 92 (54.4%) | 96 (56.8%) | |
| Single, divorced, or widowed | 77 (45.6%) | 73 (43.2%) | |
| Race/ethnicity | | | 0.30 |
| White and not Hispanic/Latino | 154 (91.1%) | 147 (87.0%) | |
| Other | 15 (8.9%) | 22 (13.0%) | |
| Income (prior year) | | | 0.85 |
| Less than $30,000 | 69 (40.8%) | 72 (42.6%) | |
| $30,001 or more | 100 (59.2%) | 97 (57.4%) | |
| Employment status | | | 0.74 |
| Employed | 31 (18.3%) | 37 (21.9%) | |
| Unemployed, disabled, or retired | 138 (81.7%) | 132 (78.1%) | |
| Education | | | 0.06 |
| Less than 4-year college degree | 108 (63.9%) | 95 (56.2%) | |
| 4-year college degree or more | 61 (36.1%) | 74 (43.8%) | |
| Urban | 138 (81.7%) | 131 (77.5%) | 0.42 |
| Service connected | 129 (76.3%) | 141 (83.4%) | 0.14 |
| Prior-year diagnosis | | | 0.34 |
| Anxiety/panic | 45 (26.6%) | 54 (32.0%) | |
| Major depression | 98 (58.0%) | 105 (62.1%) | 0.51 |
| PTSD | 89 (52.7%) | 108 (63.9%) | 0.05 |
| Delusional/schizophrenia/bipolar | 29 (17.2%) | 29 (17.2%) | 1.00 |
| Personality disorder | 29 (17.2%) | 22 (13.0%) | 0.36 |
| Substance use disorder | 35 (20.7%) | 43 (25.4%) | 0.37 |

P-values calculated using Fisher’s exact test 2-sided (for categorical variables).
P-values calculated using independent 2-sided t-test (for continuous variables).

PTSD: post-traumatic stress disorder.

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Table 2. Multivariate correlates of VA blue button usage (n = 338)

|                                    | Model 1*       | Model 2**      | Model 3***     |
|------------------------------------|----------------|----------------|----------------|
| **Demographic variables**          |                |                |                |
| Sex                                |                |                |                |
| Male                               | 1.0 (ref)      | 1.0 (ref)      | 1.0 (ref)      |
| Female                             | 0.76 (0.42–1.38)| 0.70 (0.38–1.29)| 0.59 (0.29–1.17)|
| **Age**                            |                |                |                |
| 20–29 years                        | 1.0 (ref)      | 1.0 (ref)      | 1.0 (ref)      |
| 30–39 years                        | 3.23 (0.43–24.39)| 2.89 (0.38–22.16)| 3.00 (0.25–36.57)|
| 40–49 years                        | 1.66 (0.24–11.33)| 1.34 (0.19–9.32)| 1.33 (0.12–14.63)|
| 50–59 years                        | 1.50 (0.22–10.23)| 1.39 (0.20–9.56)| 1.31 (0.12–14.71)|
| 60–69 years                        | 0.75 (0.11–5.06) | 0.62 (0.09–4.23) | 0.59 (0.05–6.29) |
| 70+ years                          | 0.29 (0.04–2.22) | 0.26 (0.03–1.97) | 0.27 (0.02–3.24) |
| **Employment**                     |                |                |                |
| Disabled, unable to work           | 1.0 (ref)      | 1.0 (ref)      | 1.0 (ref)      |
| Unemployed                         | 0.49 (0.20–1.23) | 0.50 (0.20–1.26) | 0.38 (0.13–1.08) |
| Employed                           | 0.80 (0.42–1.54) | 0.86 (0.44–1.67) | 0.81 (0.37–1.76) |
| Retired                            | 1.38 (0.75–2.54) | 1.50 (0.80–2.84) | 1.57 (0.76–3.20) |
| **Education**                      |                |                |                |
| Some high school, high school graduate or equivalent | 1.0 (ref) | 1.0 (ref) | 1.0 (ref) |
| Some college or 2-year degree      | 1.76 (0.77–4.03) | 1.88 (0.81–4.37) | 1.37 (0.51–3.69) |
| 4-year college graduate            | 1.63 (0.63–4.30) | 1.50 (0.56–3.99) | 1.19 (0.38–3.73) |
| More than 4-year college degree    | 3.47 (1.41–8.53) | 3.88 (1.55–9.72) | 2.38 (0.80–7.07) |
| **Clinical variables**             |                |                |                |
| Prior-year diagnosis               |                |                |                |
| Anxiety/panic                      | –              | 1.43 (0.84–2.41) | 1.49 (0.81–2.74) |
| Major depression                   | –              | 1.19 (0.73–1.94) | 1.40 (0.79–2.47) |
| PTSD                               | –              | 1.88 (1.15–3.06) | 2.30 (1.31–4.07) |
| Delusional/schizophrenia/bipolar   | –              | 1.10 (0.58–2.10) | 1.60 (0.74–3.46) |
| Substance use                      | –              | 1.47 (0.84–2.57) | 1.88 (0.98–3.60) |
| **Survey responses**               |                |                |                |
| eHEALS score                       | –              | –              | 1.04 (0.99–1.09) |
| How confident are you that you understand the purpose and uses of VA Blue Button? | – | – | – |
| Not at all                         | –              | –              | 1.0 (ref)      |
| Slightly                           | –              | –              | 2.42 (0.46–12.66) |
| Moderately                         | –              | –              | 6.89 (1.55–30.53) |
| Very                               | –              | –              | 9.80 (2.23–43.07) |
| Extremely                          | –              | –              | 13.36 (2.74–65.20) |
| How important is it for your health and recovery to have access to your personal health information using VA Blue Button? | – | – | – |
| Not at all                         | –              | –              | 1.0 (ref)      |
| Slightly                           | –              | –              | 0.77 (0.04–17.30) |
| Moderately                         | –              | –              | 2.25 (0.15–33.76) |
| Very                               | –              | –              | 3.72 (0.26–53.01) |
| Extremely                          | –              | –              | 3.51 (0.24–51.53) |
| Has your mental health clinician ever talked with you about being able to access and read your mental health notes using VA Blue Button? | – | – | – |
| No                                 | –              | –              | 1.0 (ref)      |
| Yes                                | –              | –              | 3.84 (1.69–8.72) |
| I don’t remember                   | –              | –              | 1.31 (0.67–2.52) |

PTSD: post-traumatic stress disorder; eHEALS: eHealth Literacy Scale; ROC: receiver operating characteristics; AIC: Akaike’s Information Criterion.

*Model 1 showed an area under the ROC curve of 0.6702 (poor) and AIC = 1.372.

**Model 2 showed an area under the ROC curve of 0.6906 (poor) and AIC = 1.373.

***Model 3 showed an area under the ROC curve of 0.8203 (good) and AIC = 1.213.

Speaking with them about being able to view their notes [OR = 3.84 (1.69–8.72)], and being very or extremely confident in understanding the purposes and use of VA Blue Button [OR = 9.80 (2.23–43.07) and OR = 13.36 (2.74–65.20), respectively] were significantly associated with having read or downloaded notes.

**DISCUSSION**

To our knowledge, this is the first study to examine predictors of viewing clinical notes online within a cohort of patients who were actively receiving mental health care and who had recently used an electronic health portal. That exactly half of the My HealthVet users in our sample had read their notes is consistent with at least 1 national VA study showing that, in general, half of veterans who have access to My HealthVet read their notes.7 We note, however, that at the time of enrollment, veterans in our sample were given information about how to use Blue Button. It is possible that had we not taken this step, we would have found an even lower rate of note viewing in this group.

In several of our initial analyses, younger age and education were associated with reading notes. These factors have been found...
to be associated with the use of the internet and eHealth resources in prior studies of other patient populations. However, while sociodemographic disparities have been described in the use of health information and communication technologies, there is some evidence that this gap may narrow within subgroups of individuals who already access the internet. Our sample was composed of recent My HealtheVet users, which may help to explain why more traditional digital divide factors did not emerge as significant in the full model.

In the full and final multivariable model, patient recall of their mental health clinician speaking with them about the availability of being able to view their notes, and patient confidence related to understanding the purposes of clinical notes were strong (and modifiable) predictors of viewing notes. These knowledge-related factors were stronger predictors than demographic factors. This finding is consistent with an extensive review of barriers and drivers of use of interactive consumer health information technology by older, chronically ill, or underserved individuals; the authors noted that "the most common factor influencing the successful use of the interactive technology by these specific populations was that the consumers perceived a benefit from using the system.”

A key finding across the multivariable analyses was that veterans with PTSD are more likely to view their notes than patients who do not have PTSD. We speculate that it is possible that anxiety, or the challenges with trust that have been associated with PTSD, may drive desires to examine clinical notes. Our results here are consistent with a prior qualitative study we conducted of this patient population suggesting that veterans with PTSD who have read their notes often have active claims for disability compensation or receive disability compensation on an ongoing basis; approval or maintenance of disability status frequently depends on information contained in the electronic record. Patients with PTSD who are concerned about their ongoing disability status may check their notes more regularly to learn about what is being documented. While this finding needs to be explored in more depth, clinicians should consider speaking proactively about notes with patients who have PTSD since, from our prior work, we found that veterans often do not tell their clinicians that they are reading their notes.

We additionally found that patients with psychotic/bipolar spectrum disorders were equally likely to view their notes as compared to those without these conditions. Findings regarding this subpopulation's use of the internet and eHealth tools have been mixed. Although one prior study showed that veterans receiving mental health services were no more or less likely to use My HealtheVet than veterans not receiving mental health care, other studies have shown that veterans with serious mental illness report less use of the internet compared to the general population, and less use of patient health portals relative to other veterans in VHA care. It may be the case that individuals within this group of Veterans, those who previously used My HealtheVet, had already overcome the main barriers to use of eHealth resources.

There are several limitations worth noting. We focused this study on Veterans who had recently accessed My HealtheVet, that is we did not examine the larger population of Veterans receiving mental health care. It is likely that the veterans who chose to participate in this study were more comfortable with the internet and use of electronic health portals than other veterans receiving mental health care who did not elect to participate. On the other hand, we wished to see what factors predicted use of OpenNotes within this patient population. Other key limitations include the cross-sectional design underlying this analysis and the use of self-report. Ideally, we would have captured note-reading directly from VA data sets; however, at the time we conducted this study, VA was capturing only downloads of notes, not necessarily when notes were viewed but not downloaded. Our stratified recruitment strategy likely resulted in increased rates of diagnosed mental health conditions compared to the larger mental health patient population. Finally, we questioned whether the relationship we found between PTSD diagnosis and viewing notes might have been confounded by individuals with PTSD possibly having greater contact with the health care system. To address this question, we conducted a post hoc analysis where we found no significant relationships between the number of visits or visit types and PTSD diagnosis.

**CONCLUSION**

Together, the findings suggest that provision of specific education about how to access and use Blue Button may be an important way to help engage patients with mental health conditions to view their notes online, if we wish for these patients to take advantage of the potential benefits the OpenNotes initiative may offer. Whether this is best accomplished by activating and preparing clinicians to discuss Blue Button with patients during clinical visits, or by delivering education directly to patients using other formats remains to be seen. Our prior work has shown that mental health clinicians are interested in obtaining more education and support to help them work effectively within the context of OpenNotes; this may include specific education about how to discuss clinical notes with patients.

**FUNDING**

This material is based upon work supported by the Department of Veterans Affairs, Veterans Health Administration, and Health Services Research and Development Service Project IIR 13-347. The funders did not give input on study design; the collection, analysis or interpretation of data; the writing of the article; or the decision to submit it for publication. The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or United States government.

**Conflict of interest statement.** None declared.

**CONTRIBUTORS**

All persons who meet authorship criteria according to ICMJE guidelines are listed as authors, and all authors certify that they have participated sufficiently in the work to take public responsibility for the content, including participation in the concept, design, analysis, writing, or revision of the manuscript. Furthermore, each author certifies that this material or similar material has not been and will not be submitted to or published in any other publication before its appearance in JAMIA Open. Conception and design of study: Dobscha, SK; Denneson, LM; Woods, SS. Acquisition of data: Pisciotta, MK; Philips-Moses, D. Analysis and/or interpretation of data: Bourne, DS; Dobscha, SK; Denneson, LM; Chen, J. Drafting the manuscript: Dobscha, SK; Denneson, LM; Bourne, DS; Revising the manuscript critically for important intellectual content: Dobscha, SK; Denneson, LM; Pisciotta, MK; Bourne, DS; Chen, J.; Philips-Moses, D.
Moses, D; Woods, SS. Approval of the version of the manuscript to be published: Dobscha, SK; Denneson, LM; Pisciotta, MK; Bourne, DS; Chen, JJ; Philippi-Moses, D; Woods, SS.

ACKNOWLEDGMENTS

We gratefully acknowledge Dr. Tom Delbanco and Dr. Jan Walker for permission to adapt survey items from their previous studies of OpenNotes, and Dr. Kathleen Carlson for assistance with interpretation of findings.

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