Assessing Brief Intervention for Unhealthy Alcohol Use: A Comparison of Electronic Health Record Documentation and Patient Self-Report

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ABSTRACT. Objective: Alcohol screening and brief intervention (BI) are recommended preventive health practices. Veterans Health Administration (VA) uses a performance measure to incentivize BI delivery. Concerns have been raised about the validity of the BI performance measure, which relies on electronic health record (EHR) documentation. Our objective was to assess concordance between EHR-based documentation and patient-reported receipt of BI, and to examine correlates of concordance. **Method:** Patients with a documented positive screen for unhealthy alcohol use at VA Greater Los Angeles primary care clinics were surveyed (within 15 days on average) in 2013–2014. Documented BI was indicated by an EHR note that the patient was advised to drink within recommended limits or reduce or abstain from drinking. Patient-reported receipt of BI corresponded to an affirmative

response to questions on whether a VA provider advised the patient to drink less or abstain. Patient report and documentation were assessed over the same period. **Results:** Documented and patient-reported receipt of BI had low concordance. Almost all patients who reported receiving BI had documentation of BI (93%; 95% CI [90%, 95%]), but only 63% [59%, 67%] of patients with documented BI reported receiving it. BI concordance was associated with more severe unhealthy alcohol use and drinking-related consequences, mental health comorbidity, and greater readiness-to-change alcohol use. **Conclusions:** Discrepancies between EHR documentation and patient-reported BI raise concerns about performance measure validity. Patient-reported receipt of BI could be an alternative or complementary measure of BI. (*J. Stud. Alcohol Drugs*, 79, 697–701, 2018)

ALCOHOL SCREENING AND brief intervention (BI) are recommended preventive health practices (Moyer & Preventive Services Task Force, 2013). Although healthcare systems have been slow to integrate universal screening and BI into routine care (Vendetti et al., 2017), the Veterans Health Administration (VA) has achieved systemwide implementation, with screening prevalence greater than 90% and BI prevalence among patients screening positive greater than 75% (Bradley et al., 2011). Critical to VA's implementation has been a clinical reminder that facilitates electronic health record (EHR) documentation and a performance measure to track and incentivize BI delivery (Lapham et al., 2012). However, the clinical reminder system documents BI regardless of quality, and an alternative measure (Bradley et al., 2011), patient-reported receipt of BI, may better reflect BI quality and has previously been used to assess the completeness of BI documentation (Berger et al., 2018; Lapham et al., 2015). Using national VA data from 2008 to

2012, Lapham and colleagues reported high concordance between EHR documentation and patient-reported receipt of BI (Lapham et al., 2015) but assessed concordance over a 1-year period among patients identified with unhealthy alcohol use on a survey, not a clinical screen. Using similar national VA data from 2009 to 2012, Berger and colleagues examined documentation and patient-reported receipt of BI among clinically screened male VA patients and reported an increase in BI documentation over the study period that did not correspond to an increase in patient-reported BI (Berger et al., 2018). Neither national VA study examined patient factors associated with concordance that could shed light on underlying reasons for disagreement between the measures and identify groups with discordant measures that could signal lower quality BI.

Our goals were to assess concordance between past-month EHR-documented and patient-reported receipt of BI among patients who screened positive for unhealthy alcohol

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use in a primary care setting and to examine correlates of concordance between the two measures. We hypothesized that patients with severe unhealthy alcohol use, severe drinking-related consequences, and co-occurring conditions (e.g., depression or anxiety) would be more likely to have concordant measures of BI.

Method

Study group

We conducted telephone surveys with patients who screened positive for unhealthy alcohol use in a primary care clinic from any VA Greater Los Angeles Healthcare System (VA GLA) facility from February 2013 to January 2014. These data were collected as part of a larger study that evaluated quality measures for the treatment of unhealthy alcohol use. A positive screen was defined as a score of five or higher on the Alcohol Use Disorders Identification Test–Consumption (AUDIT-C). We selected this threshold to correspond to the score at which VA incentivizes documented BI (Chavez et al., 2016b; Lapham et al., 2012). Eligible patients were 18 and older with a valid telephone number, no AUD diagnosis or treatment for 3 months before screening positive, at least one past-year outpatient encounter at a VA GLA facility, and no cognitive impairment. The initial telephone survey was conducted on average 15 days after the positive alcohol screen. Among 1,922 potentially eligible patients, 973 (51%; adjusted response rate [AAPOR Response Rate 1] = 54%) (American Association for Public Opinion Research, 2016) completed the baseline survey, and 770 (40%) had EHR data abstracted. EHR data were abstracted only for patients who completed a follow-up survey as part of the larger performance measure evaluation study, but we did not use data from the follow-up survey in this analysis. Because patients were asked to recall receipt of BI in the 30 days before the telephone survey, we excluded patients whose only documentation of BI was 31 or more days before the survey or 1 or more days after the survey (as a sensitivity analysis, we re-ran the analysis including these individuals, and our estimates did not meaningfully change). Among 706 eligible patients, 667 had complete covariate data for subsequent analysis. Study procedures were approved by the VA GLA Institutional Review Board and the RAND Human Subjects Protection Committee. Patients were informed that their responses would be confidential and gave verbal informed consent.

Measures of brief intervention

Documented BI was defined as an indication in the EHR of receipt of advice to drink within recommended limits or to reduce or abstain from drinking. The VA GLA BI clinical reminder followed the national model (U.S. Department of

Veterans Affairs, 2008). Briefly, following a positive alcohol screen in which a patient receives an AUDIT-C score of 5 or greater, the BI clinical reminder prompts the provider to give advice to abstain or drink within recommended limits and facilitates documentation by dropping text that advice was given into the EHR. Trained abstractors coded indications of advice from 7 days before to 60 days after the date of the positive alcohol screen. We included dates before the positive screen because in VA clinical practice, the AUDIT-C may sometimes be administered on paper before an encounter and only entered into the EHR later; thus, EHR dates could make it appear as if BI preceded alcohol screening. Inter-rater reliability of EHR documentation was high (>99%). Patient-reported receipt of BI was defined as an affirmative response to either of two questions: (a) In the past 30 days, has a VA doctor or other VA health care provider advised you to drink less or (b) in the past 30 days, has a VA doctor or other VA health care provider advised you not to drink alcohol?

Other covariates

We measured possible correlates of documented or patient-reported BI. AUD diagnoses were obtained from VA EHR data (diagnosis was assessed from 90 to 730 days before the qualifying clinical AUDIT-C screening visit, on the day of the screening visit, and up to 365 days after the screening visit). Percent heavy drinking days were computed as the proportion of available drinking days on which the patient reported heavy episodic drinking (5+ drinks for men, 4+ drinks for women; National Institute on Alcohol Abuse and Alcoholism, 2004) on the Timeline Followback (Sobell & Sobell, 1992). Drinking consequences were measured using the Short Inventory of Problems (Miller et al., 1995), and readiness-to-change drinking was measured using a validated instrument with a previously published scoring algorithm (Williams et al., 2006). Drug use was assessed with a question on use of illegal drugs in the past 30 days. Probable depression was defined as a Patient Health Questionnaire (PHQ-9) score of 10 or greater (Kroenke et al., 2001), and probable anxiety disorder was defined as a Generalized Anxiety Disorder (GAD-7) score of 10 or greater (Spitzer et al., 2006). Items from the SF-12v2 Health Survey were used to measure mental and physical health functioning (Cheak-Zamora et al., 2009). We also assessed patients' demographic characteristics using EHR (age, gender) and survey data (marital status, race/ethnicity, education, employment, use of VA care).

Statistical analysis

We calculated point and 95% confidence interval (CI) estimates of the prevalence of documented BI and patient-reported receipt of BI and summarized concordance using

TABLE 1. Distribution of brief intervention (BI) measures, comparing electronic health record documentation of BI and patient-reported receipt of BI

Documented BI	Patient-reported receipt of BI		Total
	No	Yes	
No	50	32	82
Yes	229	395	624
Total	279	427	706

simple agreement and a kappa statistic (Cohen, 1960). We estimated the proportion of patients concordant on both measures of BI and compared characteristics of patients with concordant versus discordant BI information using chi-square tests of independence for categorical variables and *t* tests for comparisons of means. We also compared characteristics of patients with and without provider documentation of BI and who did or did not report receipt of BI. We compared survey responders and nonresponders with respect to patient demographics (age, income, marital status, sex, and period of service) and found no clear evidence of a difference ($p > .2$ for all bivariate tests).

Results

Most patients were male ($n = 652$, 97%), White ($n = 360$, 55%), had completed at least some college ($n = 468$, 70%), and reported receiving all or most of their care through the VA ($n = 565$, 85%); more than one third of participants were age 65 and older ($n = 245$, 37%).

Overall, 624/706 patients (88%; 95% CI [86%, 91%]) had EHR documentation of BI, and 427/706 patients (60%; 95% CI [57%, 64%]) reported receiving BI in the 30 days before the survey (Table 1). Simple agreement (percent concordant) was 63% [59%, 67%], with 56% concordant for receiving BI and 7% concordant for not receiving BI; however, the kappa statistic measuring agreement accounting for chance was only .12. Most patients who reported receiving BI had provider documentation (395/427; 93%, [90%, 95%]), but only 395/624 (63%; [59%, 67%]) who had BI documentation reported receiving it. Considering patient report as the “gold standard,” provider documentation has a sensitivity of 92.5% for “detecting” BI, but a specificity of only 17.9%. Concordant and discordant patients had similar demographics but different health characteristics (Table 2). Concordant patients, most of whom had both EHR documentation and patient report of BI, had more severe unhealthy alcohol use and drinking-related consequences, were more likely to receive an AUD diagnosis on or after the date they screened positive, and had greater readiness-to-change alcohol use compared with discordant patients.

Patients with a greater number of instances of documented BI were more likely to report receiving it. Patients with documented BI were also younger, less likely to have

at least some college education, and more likely to get all or most healthcare at the VA than patients without documentation. BI documentation was associated with more severe unhealthy alcohol use (diagnosis of AUD before, on, or after the screening visit; higher alcohol screening scores; and higher percentage of heavy drinking days), greater drinking-related consequences, probable depression or anxiety, and lower mental health functioning. The same characteristics were associated with patient-reported receipt of BI (vs. no patient report), but patients who reported receiving BI were also more likely to report past-month drug use and lower physical health functioning.

Discussion

Among predominantly middle-aged, male outpatients screening positive for unhealthy alcohol use, there was low concordance between provider-documented and patient-reported receipt of BI in the past 30 days. Two previous national VA studies using similar data reported concordance between EHR documentation and patient-reported receipt of BI of 58.2% in a survey-screened sample (Lapham et al., 2015) and 66.2% in a clinically screened sample from 2012 (Berger et al., 2018), both of which are similar to the simple agreement in this study (63%). However, in contrast to a previous study, we did not conclude that performance measures based on EHR documentation of BI are comparable to patient report for the purposes of assessing care, because despite the high simple agreement, concordance accounting for chance agreement was only 12%.

We found a similar prevalence of patient-reported BI (60%) to that reported by Lapham and colleagues (59.0%; Lapham et al., 2015) and Chavez and colleagues (56% from October 2010 through September 2011; Chavez et al., 2016a) and a slightly lower prevalence than that reported by Berger and colleagues (65%–70%). However, prevalence of documented BI was much lower in the Lapham study (37.4%) than in either the Berger study (59%–83% from 2009 to 2012) or in ours (88%). Moreover, prevalence of documented BI among patients who reported receiving it was twice as high in our study (93%) as in the Lapham study (46%). This discrepancy could reflect that the Lapham study identified a screen-positive sample using a survey-based AUDIT-C, rather than a clinical AUDIT-C, and as a consequence, only 39.4% of patients in their analysis had a positive clinical screen that would have been the indication for provider-administered BI. Supporting the latter explanation, the Berger study, which focused on patients screening positive clinically, reported that among patients who reported receiving BI in 2012, 85% had documentation in the medical record, similar to the proportion in our study. Also, the two previous VA studies assessed EHR documentation of BI by searching for text dropped into the EHR automatically as part of the VA's clinical reminder system, whereas we as-

TABLE 2. Characteristics of patients with concordant versus discordant measures of brief intervention, comparing electronic health record documentation of brief intervention and patient-reported receipt of brief intervention

Variable	Concordant (<i>n</i> = 433)	Discordant (<i>n</i> = 234)	<i>p</i> ^a
Male (%)	98 ^b	97	.40
Age category (%)			.14
<35 years	18	12	
35–49 years	13	12	
50–64 years	33	37	
≥65 years	36	39	
Married or living as married (%)	38	37	.80
Race/ethnicity (%)			.93
Non-Hispanic White	53	56	
Non-Hispanic Black	14	14	
Hispanic	27	25	
Other	6	5	
At least some college (%)	68	74	.13
Employment category (%)			.19
Employed	38	38	
Unemployed	16	11	
Out of labor force	46	51	
All/most care at VA (%)	87	81	.08
Readiness to Change category (%)			<.01
Pre-contemplation	10	32	
Contemplation	54	41	
Action	36	28	
Drug use in past month (%)	10	8	.34
Probable depression (%)	19	14	.09
Probable anxiety (%)	16	12	.12
Prior AUD diagnosis ^c (%)	32	17	<.01
AUD diagnosis on index date ^d (%)	32	12	<.01
AUD diagnosis after index date ^e (%)	32	17	<.01
Baseline Audit-C score (%)			<.01
0	1	2	
1–4	12	19	
5–7	46	59	
8–12	41	20	
Screening Audit-C score (%)			<.01
5–7	68	79	
8–12	32	21	
Short Inventory of Problems score (<i>M</i>)	5.9	2.6	<.01
Percent heavy drinking days (<i>M</i>)	25.9	13.7	<.01
SF-12 Physical Component Score (<i>M</i>)	45.8	48.1	<.01
SF-12 Mental Component Score (<i>M</i>)	51.5	53.5	.02

Notes: VA = Veterans Affairs; AUD = alcohol use disorder; AUDIT-C = Alcohol Use Disorders Test—consumption questions; SF-12 = 12-Item Short-Form Health Survey. ^a*p* values are from chi-square tests of independence or t-tests of equality of the means across groups; ^bpercentages are column percentages; ^cprior alcohol use disorder (AUD) diagnosis was assessed from 90 to 730 days prior to the qualifying clinical AUDIT-C screening visit; ^dnew AUD diagnosis on the same date as the qualifying clinical AUDIT-C screening visit was assessed among the subset of patients with no prior AUD diagnosis in the 730 days prior to the index visit (*n* = 487); ^eAUD diagnosis after the index date was assessed up to 365 days after the date of the qualifying clinical AUDIT-C screening visit.

sessed documentation by abstracting patients' progress notes from the EHR, which may have resulted in more complete ascertainment of documented BI in this study.

Patients with more severe unhealthy alcohol use, worse drinking consequences, and greater readiness-to-change drinking were all more likely to have concordant BI measures, mainly because of patients who were positive on both measures. The reasons for this are likely varied but

may reflect differences in both the documentation and delivery of BI across patient groups. Patients with severe unhealthy alcohol use, problems related to drinking, and readiness-to-change drinking may be more willing to discuss their alcohol use with their provider and also to disclose those conversations in a research survey, which could contribute to the high concordance for these patients. Providers may also have greater rapport or simply more to say to patients with more severe unhealthy alcohol use and drinking-related problems, which may result in higher-quality BI being delivered and subsequently recalled by the patient. Conversely, for patients with less severe unhealthy alcohol and fewer drinking-related problems, discussions about alcohol may not be a high priority and providers may be reluctant to discuss a sensitive topic if it could undermine clinical rapport with their patients.

Our study had limitations. Despite our use of standardized measures, respondents may have misremembered or misreported receiving BI, and documentation may not have been complete and may not have reflected the care delivered. Although responders to the survey did not appear to differ systematically from nonresponders, responders may have differed from the broader patient population on characteristics we did not measure. Our study was conducted in a single VA healthcare system, but we note that our study participants had a similar prevalence of documented and patient-reported BI to that calculated using near-contemporaneous national data (Berger et al., 2018), which may support the generalizability of our findings. Although we had liberal guidelines for what constituted EHR documentation of BI to minimize the risk of missing BI that was documented, it is possible that documentation did not capture the guideline-concordant BI it was intended to measure. Finally, although more instances of documented BI were associated with greater patient-reported receipt, we lacked information on the quality of BI being delivered. It is possible that some of the discrepancy between documentation and patient-reported receipt of BI reflects gaps in BI quality rather than delivery per se.

Conclusions

In contrast to research that established the efficacy of BI, recent evaluations of the VA's alcohol screening and BI program have raised questions about BI effectiveness in real-world settings (Williams et al., 2014). The apparent lack of effectiveness may reflect that in routine practice, BI is not being delivered with sufficient intensity or quality to "stick" with the patients receiving it, which may also explain why in our study many patients with documented BI did not recall or report receiving it. EHR documentation does not guarantee that BI is high-quality or impactful; therefore, use of patient-report to supplement or complement existing performance measures may help identify documentation and

care quality shortfalls and yield patient perspectives that can improve BI delivery. However, further work is needed to establish the utility of patient-reported BI as a performance measure and to assess whether patient-reported receipt of BI is associated with subsequent drinking outcomes.

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