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An Assessment of SBIRT Prescreening and Screening Outcomes by Medical Setting and Administration Methodology

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Abstract

Background: Screening, brief intervention, and referral to treatment (SBIRT) is an efficacious prevention practice. However, little research has assessed differences in prescreening outcomes between inpatient and outpatient primary care or among different prescreening administration methods. This study tested whether administration method (self-administered vs interview) and setting (inpatient versus outpatient) predicted prescreening outcomes in a large sample of primary care patients. Then, among patients who prescreened positive, it tested whether full screening scores differed by administration method and setting.

Methods: Researchers used binomial logistic regression to assess predicted prescreening outcomes and analysis of variance to assess differences in SBIRT screening scores across a total of 14 447 unique patient visits in 10 outpatient sites and 1 centrally located hospital.

Results: Controlling for gender, depression, and other substance use, both medical setting and method of prescreening, predicted prescreening results. Among patients who prescreened positive for alcohol, setting also was associated with mean screening scores. However, outcomes were not uniform by substance (eg, alcohol vs other drugs).

Conclusion: The results support previous studies on this topic that had utilized cross-study comparison or that were not specific to SBIRT prescreening/screening mechanisms. At the same time, nuanced findings were observed that had not previously been reported and suggest the need for further research in this area.

Keywords
program evaluation, primary care, prevention, health promotion, hazardous drinking

Introduction

In 2013, approximately 9% of Americans aged 12 years and older had used one or more illicit drugs in the past month, and 23% reported binge drinking in the past month.[1] Much of this behavior may fall outside of diagnostic guidelines for dependent or disordered use, instead qualifying as risky or harmful use, which may go undetected[2] and/or be asymptomatic.[3] Screening, brief intervention, and referral to treatment (SBIRT) is a method of integrating behavioral health and primary care to identify patients' substance use and provide appropriately matched services. The SBIRT typically begins with a preliminary screening (prescreening), and patients who prescreen positive are asked to complete a full screening. Patients whose full screenings suggest risky, harmful, or dependent levels of use are provided with services based on the outcomes of the screening tool(s) and the care provider's clinical judgment.[4] These services include brief interventions, which increasingly utilize motivational interviewing as a mechanism to promote change,[5,6] brief treatment, and referral to treatment.[7]

The Substance Abuse and Mental Health Services Administration has funded SBIRT implementation in both inpatient and outpatient settings.[8] Multiple studies have supported the effectiveness of SBIRT for alcohol in outpatient primary care

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settings,[9,10] although recent studies[11,12] have disputed support for the widespread dissemination of SBIRT to target illicit drug use, contradicting prior research.[13] The Joint Commission published standards for national hospital inpatient quality in 2012 that included screening and brief intervention (SBI) for alcohol as an optional core measure.[14] This standard matches literature supporting the efficacy and importance of SBIRT for alcohol in inpatient care.[15,16] Compared to these findings, comparatively little research has addressed SBIRT's efficacy for drug use in inpatient hospital settings.

There is still a need to examine the prevalence of alcohol and other drug use in inpatient and outpatient medical settings. Research currently suggests that individuals who receive inpatient care for substance use disorders typically experience mental health-related comorbidities[17] and are more likely than other individuals to require recurrent acute care.[18] Studies utilizing full screening tools generally have identified a higher prevalence and/or severity of alcohol consumption in inpatient care than in outpatient clinics.[19-21] However, by nature of when they were conducted, such studies did not have access to the currently recommend SBIRT prescreening questions. As previously described, SBIRT now incorporates validated prescreening using single questions for alcohol[22] and drugs[23] to assess eligibility for longer screening tools. Little research has assessed differences in prescreening outcomes between inpatient and outpatient settings using those questions, especially within the same geographic region, which may influence substance use behavior.[24]

Another factor that may influence prescreening outcomes is the fact that SBIRT programs often use the same prescreening tools but different administration methods (self-administered or interview based). Some individuals view substance use as socially unacceptable or immoral[25] and may be less likely to answer interview-based questions accurately,[26-28] though the alternative, self-administered forms, may produce less sensitive and specific data.[29] However, linking substance use prevention and treatment to primary medical care treatment—a principal component of SBIRT—may serve to reduce stigma[30] and mitigate some of those effects. Finally, comorbidity between alcohol use, other drug use, and depression is well-established[31] and should be included in models assessing prescreening outcomes. There is therefore also a need to assess the impact that prescreening administration methodology might have on prescreening outcomes.

Given those gaps in knowledge, this article describes an analysis of secondary data from a safety-net health services organization that integrated SBIRT for both alcohol and drug use into 10 outpatient primary care clinics and a centrally located inpatient general hospital. Of those 11 total sites, 4 utilized interview-based prescreening and 7 utilized self-administered prescreening. This study tested whether administration method (self-administered vs interview) and setting (inpatient versus outpatient) predicted prescreening outcomes in a large sample of primary care patients. Then, among patients who prescreened positive, it tested whether full screening scores differed by administration method and setting. Reporting these results represents an important step in evolving and directing future research on SBIRT in primary care.

Methods

Data for this study were collected between September 8th, 2014, and February 18th, 2015, from a safety-net health services organization in Indianapolis, Indiana. Data from outpatient settings were collected from 10 different primary care centers from the same county, while data collected from the inpatient setting were from patients admitted to the adult medicine wards at a centrally located hospital. To protect patient confidentiality, the data set utilized for this study was deidentified.

The inclusion criterion for this study was all adults (age 18+) who attended any of the study sites during the study period and who also were eligible for their annual SBIRT prescreen, meaning they had not been prescreened within a year or were a new patient within the system. In total, data for 14 447 unique patients were collected and organized in preparing this report, distributed among 10 outpatient clinics (n = 13 315) and 1 inpatient hospital (n = 1130). The overall sample was 63% female (n = 9076) and 37% male (n = 5363) and was 18% Hispanic or Latino (n = 2540), 41% African American (n = 5960), 31% White (n = 4442), and 2.8% individuals of other races (n = 416). Data were not available for some patients' race (25%, n = 3,629) and/or ethnicity (9.5%, n = 1358).

As a standard of care, all patients attending the clinics and hospital wards during the study period completed the single-question prescreens for alcohol and illicit drugs/prescription drugs for nonmedical reasons[22,23] and the Patient Health Questionnaire-2 (PHQ-2) screening tool[32] for depression. The questions were either completed by self-administration on a paper form in the waiting room (6 outpatient clinics, n = 9459 and the hospital site, n = 1130) or interview with a medical assistant in a triage exam room (4 outpatient clinics, n = 4986). Since this process was part of an implementation project, administration type was not randomly assigned to sites; rather, as part of the overall organizational planning process, clinic managers at each site met with a technical assistance team and selected the method that they felt best met the needs of their clinic's staff and patients. In clinics using self-administered prescreening forms, a Spanish translation was available, and in clinics using the oral interview format, a Spanish-speaking medical assistant was available.

Patients who prescreened positive for alcohol or drugs met with a social worker or mental health counselor to complete full screening instruments matched to the positive prescreening result(s). The Alcohol Use Disorders Identification Test (AUDIT) was used for alcohol[33] and the Drug Abuse Screening Test (DAST) was used for drugs.[34] Additional information regarding the structure of data collection for this SBIRT program previously has been published.[35]

In order to determine whether prescreening outcomes for alcohol and drugs were independent from setting and

administration, we created 2 binary logistic regression models to compute adjusted odds ratios with prescreening results set as the outcome variable and setting, administration method, gender, depression (PHQ-2), and use of other substances set as predictor variables. Race/ethnicity were not included as predictor variables because the substantial amount of missing data was nonrandom. Then, in order to determine whether the mean screening scores among patients who completed the AUDIT and/or DAST were different between those attending outpatient and inpatient settings and those receiving different prescreening methods, the researchers used analysis of variance, adjusting post hoc comparison based on whether the assumption of equal variances was met (Tukey HSD) or not (Games-Howell).

Results

Overall percentages of positive prescreens by setting and administration type are available in Table 1. In the model for alcohol (see Table 2), self-administered prescreens were 2.4 times more likely to be positive than interview prescreens, and prescreens completed by inpatients were 1.4 times more likely to be positive than those by outpatients. Further, males were 2.2 times more likely to prescreen positive than females, patients prescreening positive for depression were 1.5 times more likely to prescreen positive for alcohol, and patients prescreening positive for drugs were 5.1 times more likely to prescreen positive for alcohol. In the model for drugs (see Table 2), prescreens completed by inpatients were 2.6 times more likely to be positive as those by outpatients. Males were 2.0 times more likely to prescreen positive than females, patients prescreening positive for depression were 2.2 times more likely to prescreen positive for drugs, and patients prescreening positive for alcohol were 5.0 times more likely to prescreen positive for drugs. However, administration type did not predict prescreening outcomes for drugs.

Finally, within the subsample of individuals who prescreened positive for alcohol and who completed the AUDIT screening instrument (n = 1433), the mean AUDIT score for patients in the outpatient setting with a self-administered prescreening was 7.3, the mean AUDIT score for patients in the outpatient setting with an orally administered prescreening was 8.2, and the mean AUDIT score for patients in the inpatient setting was 11.3. The overall comparison of means was significant ($f = 27.5$, $P < .001$), with both outpatient screening scores being significantly lower than the inpatient score (see Table 3). However, within the subsample of individuals who prescreened positive for other drugs and who completed the DAST screening instrument (n = 782), the mean DAST score for patients in the outpatient setting with a self-administered prescreening was 2.6, the mean DAST score for patients in the outpatient setting with an orally administered prescreening was 2.6, and the mean DAST score for patients in the inpatient setting was 2.2. The overall comparison of means was nonsignificant ($f = 2.8$, $P = .062$; see Table 3).

Table 1. Percentages of Positive Prescreens by Setting and Administration Type.

	Alcohol	Other Drugs
Outpatient (N = 13 315)[a]	11.3% (n = 1500)	5.2% (n = 686)
Self-administered (n = 8329)	14.4% (n = 1201)	6.1% (n = 504)
Interview (n = 4986)	6.0% (n = 299)	3.7% (n = 182)
Inpatient (n = 1130)	24.6% (n = 278)	17.4% (n = 197)

[a]Self-administered and interview are both subsets of the outpatient category.

Table 2. Adjusted Odds Ratios of Positive Prescreening by Setting and Administration Type.[a]

Alcohol	AOR	95% CI	*P*
Administration[b]	2.43	2.12-2.79	<.001
Location[c]	1.38	1.18-1.62	<.001
Gender[d]	2.23	2.01-2.48	<.001
Depression prescreen[e]	1.48	1.31-1.66	<.001
Drug prescreen[e]	5.05	4.34-5.88	<.001
Other drugs			
Administration[b]	1.20	0.99-1.44	.051
Location[c]	2.56	2.11-3.10	<.001
Gender[d]	1.97	1.70-2.29	<.001
Depression prescreen[e]	2.15	1.85-2.51	<.001
Alcohol prescreen[e]	5.02	4.32-5.85	<.001

[a]1 = comparison category.
[b]1 = interview; 2 = self-administration.
[c]1 = outpatient; 2 = inpatient.
[d]1 = female; 2 = male.
[e]1 = negative; 2 = positive.

Discussion

This study found evidence suggesting that setting and administration method may be associated with prescreening outcomes in some cases. First, the higher number of positive prescreens among inpatients identified in this study was conceptually consistent with prior research.[19-21] This study adds to existing knowledge by verifying such findings using the currently suggested SBIRT prescreening questions while controlling for important confounding factors (gender, prescreening administration type, depression, and other drug use). However, it cannot be concluded from these data alone that patients are more willing to admit to alcohol use in one medical setting versus another.

In addition, the finding that patients using a self-administered form prescreened positive for alcohol more often than those completing an interview is consistent with prior research.[25-27,36] As before, this is one of the first studies to examine whether this would hold true when using currently recommended SBIRT prescreening forms. Interpretation of this finding is limited in scope, though, as this retrospective study was unable to randomize clinics to prescreening administration types; although some variables were controlled for and although all of the clinics in the study were located within the same county, it is possible that the prevalence of alcohol use was higher in some patient populations than in others. This concern was somewhat attenuated, but not eliminated, by aggregating groups of clinics (4 and 6) together for analyses.

Table 3. Mean Differences (ANOVA) in Screening Score by Setting and Type.

	Mean Score	*F*	*P*
Alcohol (AUDIT, n = 1433)			
Outpatient (SA)	7.30[a]		
Outpatient (interview)	8.21[b]		
Inpatient	11.28[a,b]	27.5	<.001
Other Illicit Drugs (DAST, n = 782)			
Outpatient (SA)	2.55		
Outpatient (interview)	2.57		
Inpatient	2.15	2.79	.062

Abbreviations: SA, self-administered; ANOVA, analysis of variance; AUDIT, Alcohol Use Disorders Identification Test; DAST, Drug Abuse Screening Test.
[a]Significant pairwise comparisons at $\alpha = .05$.
[b]Significant pairwise comparisons at $\alpha = .05$.

Interestingly, patients using a self-administered form did not prescreen positive for other drugs more or less often than those completing an interview, suggesting a possible inconsistency in how patients prefer to respond to the alcohol and drug prescreening questions. Any work that further investigates this topic should attend closely to this discrepancy to see if it is replicated, and, if so, why. A randomized experiment testing the impact of medical setting and prescreening administration method on responses to the SBIRT prescreening questions may be warranted based on these findings and might usefully inform organizations attempting to situate behavioral health resources within a health care organization.

In addition, mean scores on the AUDIT and DAST were not affected by prescreening method among outpatients. However, significant pairwise differences were observed between outpatient and inpatient settings across mean screening AUDIT scores. The mean scores in the outpatient were 7.3 (self-administered) and 8.2 (interview), where a score of 8 is considered to be the cutoff at which a patient likely will benefit from a brief intervention[33] and/or begin to experience harms related to alcohol.[37] On the other hand, the mean score in the inpatient setting was 11.1, well into the range of scores indicating the need for a brief intervention (8-15), affirming prior findings that alcohol use severity may be higher in inpatient settings.[21] For the DAST, the mean scores in the outpatient setting were both 2.6 and 2.6, where a score of 1 to 2 indicates a low degree of problems related to drug abuse, and a score of 3 is the cutoff for a moderate degree of problems.[34] The mean score in the inpatient setting was 2.2, but no significant differences were observed. Interestingly, these findings suggest that, in outpatient settings, method of prescreening may not impact SBIRT's ability to detect clinically significant problems using a full screening tool. However, this finding cannot be generalized to inpatient settings, where only self-administration was utilized.

This study has several additional limitations. First, because this study was conducted within a single health care organization, it has limited generalizability to other health care organizations; however, we suggest some generalizability to other urban safety net hospitals and health systems. Second, literacy levels vary, and it is difficult to determine the effects that literacy levels may have had on the results of the self-administered screening tools, and in what direction, if any, that may have biased the results. Finally, this study was unable to include race and ethnicity as control variables in the regression models, so it is unclear how cultural differences may have impacted elicitation of patient responses, although the sample included in this study was both racially and ethnically diverse.

Conclusion

This study examined differences in SBIRT prescreening and screening results by prescreening administration method and medical setting using currently recommended SBIRT processes. Prior work in these areas was strong but did not have access to more recent advances related to prescreening. This work concurred with many previous findings regarding substance use prevalence and severity while suggesting several new directions for research.

Authors' Note

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