

The Association between Receipt of Brief Alcohol Intervention and Quality of Care among
Veteran Outpatients with Unhealthy Alcohol Use

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Abstract

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Background: Brief alcohol intervention, including advice to reduce or abstain from drinking, is widely recommended for general medical outpatients with unhealthy alcohol use. Providers report reluctance to deliver such interventions citing concerns about negatively affecting their patient relationships

Objective: To determine, among veteran outpatients with unhealthy use, whether receipt of brief intervention was associated with patient-reported indicators of care quality.

Design: Cross-sectional, secondary analysis of quality improvement data collected through the VA Survey of Healthcare Experiences of Patients (SHEP).

Patients: Veteran outpatients who: 1) responded to the outpatient, long-form SHEP (2009-2011), 2) screened positive for unhealthy alcohol use (Alcohol Use Disorder Identification Test

Consumption Questionnaire [AUDIT-C] score ≥ 3 women; ≥ 4 men), and 3) responded to a question regarding receipt of brief intervention and to two questions assessing patient ratings of care quality.

Main Measures: We used generalized estimating equations to determine the independent associations between receipt of brief intervention (patient-reported receipt of alcohol-related advice from a VA provider in the preceding year) and two quality of care ratings: patient-reported ratings of their VA provider and overall VA health care (range 0-10, dichotomized ≥ 9 to indicate high quality).

Key Results: Among 10,612 veterans meeting inclusion criteria (16.0% of all respondents), 43.7% reported receipt of brief intervention, and 84.2% and 79.1% of respondents rated their provider and VA health care as high quality, respectively. In multivariable models, compared to veterans who did not report brief intervention, those who reported brief intervention were more likely to rate their provider (86.9% vs. 82.0%, $p < 0.01$) and overall VA healthcare (82.7% vs. 75.9%, $p < 0.01$) as high quality.

Conclusions: Results from this cross-sectional analysis among veterans with unhealthy alcohol use demonstrate that receipt of brief intervention was positively associated with patient-reported indicators of high quality care, findings that are in opposition to provider concerns that delivering such advice may adversely affect patients' perceptions of their care.

INTRODUCTION

Unhealthy alcohol use is common among general medicine outpatients,^{1,2} is associated with tremendous costs to society,³ and is a cause of significant patient morbidity and mortality.⁴⁻⁷ Brief alcohol intervention, which includes advice to reduce or abstain from drinking, has demonstrated efficacy in reducing alcohol consumption among general medicine outpatients with unhealthy alcohol use identified by population-based screening.⁸⁻¹⁰ Thus, population-based screening followed by brief intervention for those who screen positive is widely recommended for general outpatient populations.¹¹⁻¹³

Despite these recommendations, implementation has been challenging,¹⁴⁻¹⁶ and rates of screening and brief intervention vary significantly across settings.^{17,18} A number of barriers to delivering brief alcohol interventions have been identified.¹⁹⁻²² Among them, providers have reported concerns that patients may react negatively to such conversations, that they prefer not to discuss their drinking, and that such conversations may be considered an intrusion of privacy.^{19-21,23-25} In other words, providers have demonstrated a concern that these discussions may compromise their relationships with patients. However, a previous study among primary care patients with unhealthy alcohol use found that those who reported receipt of brief intervention rated their care as higher quality than those not reporting counseling,²⁶ thus calling into question providers' perceptions that such discussions may compromise their relationships with patients. Importantly, that study was conducted among a sample of patients who consented to participate in a clinical trial focused on reducing their alcohol use and may have been seeking feedback on their drinking. Therefore, it is unknown whether receipt of brief intervention is associated with patient-reported indicators of care quality among a more general sample of outpatients with unhealthy alcohol use.

The Veterans Health Administration (VA) has implemented population-based screening for unhealthy alcohol use with the validated Alcohol Use Disorder Identification Test Consumption Questionnaire (AUDIT-C)²⁷ and, in 2007, announced a national performance measure to incentivize provision of brief alcohol intervention for all patients with AUDIT-C scores ≥ 5 .¹⁸ Despite challenges other systems have had in implementing population-based screening and brief intervention, the VA has achieved high rates of both.¹⁸ More than 90% of active primary care patients in the VA are screened for unhealthy alcohol use annually, and among those who screen positive, more than 75% have brief intervention documented in their electronic medical record.²⁸ Additionally, the VA has also increased its focus on delivering care that is patient-centered,²⁹ and routinely measures the experiences and perceptions of care of a large national sample of veteran outpatients.^{30,31} Thus, the VA provides a unique opportunity to assess the relationship between receipt of brief alcohol intervention and patient-reported indicators of quality of care among a general sample of outpatients. The aim of this study was to determine, among a sample of VA outpatients who responded to a mailed patient satisfaction survey and screened positive for unhealthy alcohol use, whether receipt of brief intervention was associated with patient-reported indicators of quality of care. We hypothesized that patients who reported receipt of brief intervention would be more likely to report receiving high quality care.

Conceptual Framework

The following conceptual model describes established or hypothesized factors that influence the relationship between receipt of brief intervention and patient-reported quality of care (Figure 1).

Patient Characteristics: Patient sociodemographic and clinical characteristics are related to both receipt of brief intervention and perceived quality of care. Previous studies have demonstrated that provision of brief intervention varies based on patient sociodemographic characteristics, including: age, gender, race/ethnicity, education, employment, and marital status.^{30,32-36} Not surprisingly, providers are more likely to report providing brief intervention to patients with worse health status and those in higher risk categories of unhealthy alcohol use.^{9,35,37} Similarly, patient-reported outcomes, such as quality of care indices and patient satisfaction are correlated with respondent sociodemographic characteristics and health status.³⁸⁻⁴⁰ To our knowledge, the relationship between severity of unhealthy alcohol use and patient-reported indicators of care quality has not been studied; though we hypothesize that the two factors are strongly correlated.

A patient's overall health knowledge may also affect this relationship. A patient who recognizes unhealthy alcohol use as a clinical condition and brief intervention as a recommended intervention, similar to cancer screening, may be more likely to report that brief intervention was a marker of high quality care. Alternatively, for patients who do not recognize alcohol use disorders as clinical conditions, or their associated interventions as appropriate care, brief intervention would be unlikely to improve their perception of their care. In fact, in these cases, the intervention may be viewed as unnecessary or inappropriate and may actually lower patients' perceptions of care quality.

A patient's history of stigmatization may also play a significant role in this relationship. Mental health disorders, particularly alcohol and drug-related disorders, are heavily stigmatized conditions.³⁹ If patients have a history of stigmatization based on their alcohol use, they may be more likely to identify their provider's focus on their alcohol use as continued stigmatization or discrimination. A history of stigmatization unrelated to mental health disorders (e.g., racial or economic discrimination) may also be important for similar reasons. A patient who has experienced such stigmatization may be more likely to react negatively to alcohol-related discussions if he or she identifies alcohol disorders as stigmatized conditions. Additionally, if providers perceive a history of discrimination among their patients, or a resistance to discussing sensitive topics such as alcohol use, they may be less likely to provide brief intervention out of concern for harming their patient relationships.

Provider Characteristics: Sociodemographic characteristics of providers may also be important confounders of the relationship between brief intervention and patient perceptions of their care. First, the type and extent of training received by a provider may vary based on their age, gender, and race/ethnicity, and thus, such characteristics may influence the likelihood of a provider delivering brief intervention, as well as the skill with which brief intervention is delivered.^{34,41} Previous studies have also shown that provider characteristics may influence patient perceptions of their care,⁴² and patients may be more likely to perceive higher quality care if their race is concordant with the race of their provider.⁴³ Provision of brief intervention also varies by provider type (i.e., trainee, physician, registered nurse). For example, nurse practitioners are more likely to report providing brief intervention than physicians. There are also established differences in how patients perceive quality of care based on provider type.⁴⁴ Differences in job training and role responsibilities (independent of provider type) may influence

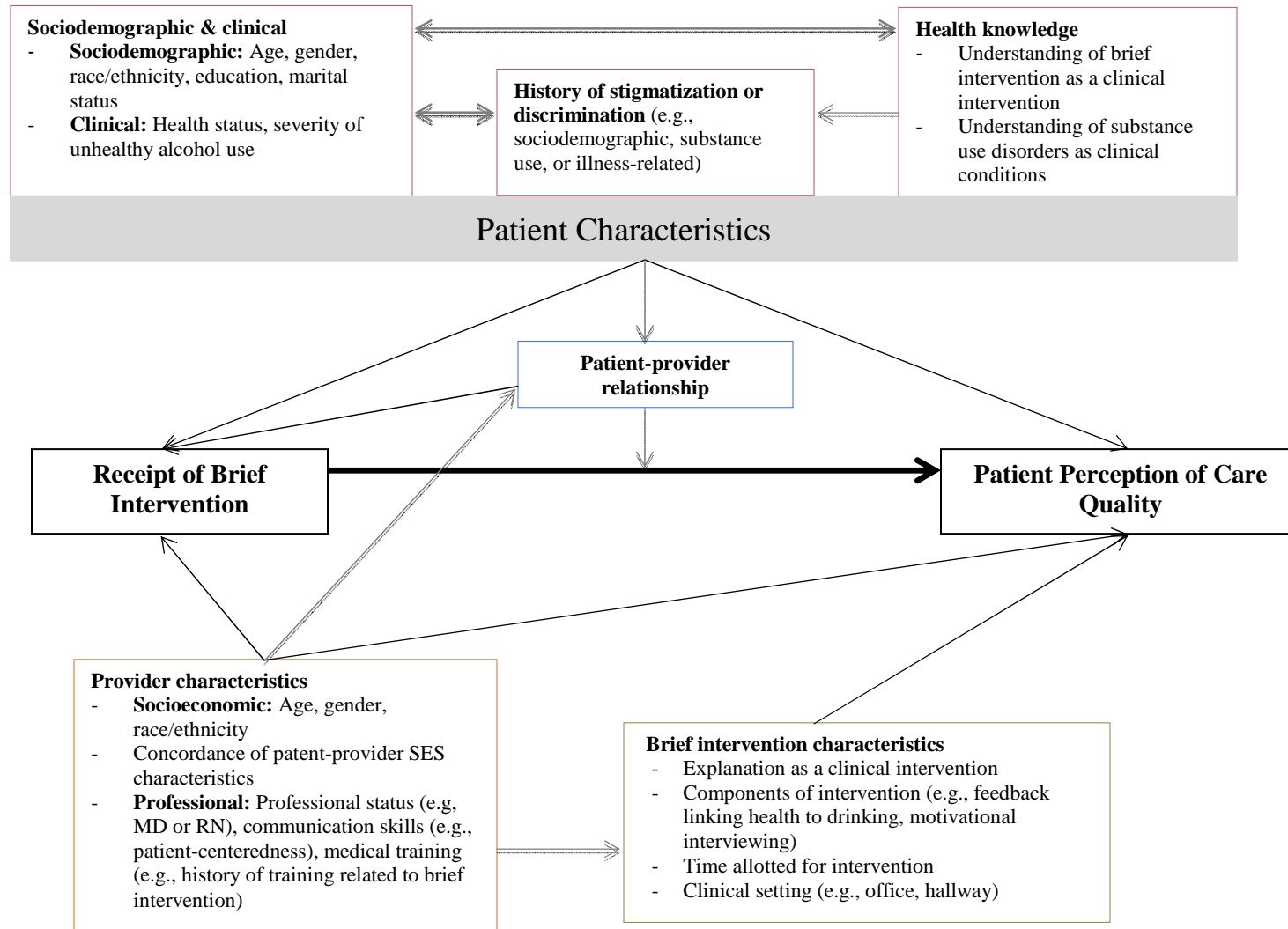
the likelihood of a provider delivering brief intervention,⁴⁵ as well as the skill with which brief intervention is delivered.

Characteristics of the Brief Intervention: The specific details of the exposure of interest are an important aspect of this conceptual model. Though often thought of as a uniform clinical intervention, the components and delivery of brief intervention may vary significantly between settings. Brief intervention includes advice to reduce or abstain from drinking and feedback linking patients' health status to their drinking, and may be delivered through a variety of mechanisms, including motivational interviewing techniques. Patients may react more favorably to certain components of brief intervention, and similarly, may perceive individual components of brief intervention as more important or high quality than others. Whether appropriate time was allotted for the intervention, and whether it was conducted in an appropriate setting (e.g., provider office vs. hallway) may also influence patients' perceptions of their care. The components of brief intervention and the expertise and commitment with which it is delivered may significantly affect patients' perception of their overall care quality. Additionally, we hypothesize that these characteristics are dependent on provider characteristics. For example, the skill with which brief intervention is delivered, time allotted for the intervention, and the setting that it occurs in may all vary based on provider training and specific job title (e.g., physician vs. nurse practitioner).

Patient-Provider Interactions: Brief intervention is only a small aspect of health care delivered within a broader context of the patient-provider relationship. We hypothesize that this relationship, which may be influenced by a variety of patient and provider-specific characteristics, moderates the relationship between receipt of brief intervention and patient perceptions of their care. If both patients and their providers perceive their relationship as a

positive one, providers may be more comfortable carrying out alcohol-related interventions and patients may react more positively to such discussions.

Figure 1: Conceptual framework of the relationship between brief intervention and patient perceptions of care quality



METHODS

Data Source and Study Sample

For this cross-sectional analysis, we used secondary quality improvement data collected by the VA Office of Quality and Performance. Specifically, we analyzed data from the long-form version of the VA Survey of Healthcare Experiences of Patients (SHEP),³⁵ an ongoing survey of veterans receiving care at VA health care facilities. The long-form SHEP is administered using a stratified random sample without replacement design and is fielded monthly to a fixed number of veterans who visited an outpatient facility in the preceding month. The survey assesses respondent sociodemographic characteristics, health status, and perceptions and experiences of care, including patient satisfaction and patient-reported indicators of quality of care using validated measures from the Consumer Assessment of Healthcare Providers and Systems Clinician and Group Survey (CAHPS).³⁴ Additionally, the long-form SHEP includes alcohol screening questions and a single question regarding receipt of alcohol-related advice from a provider.

We included unique veteran outpatients who: 1) responded to the outpatient, long-form SHEP from fiscal years 2009 to 2011, 2) screened positive for unhealthy alcohol use on the 3-item AUDIT-C included in the survey based on validated cut points (score ≥ 3 for women, ≥ 4 for men) [Supplemental Table 1],^{36,46} and 3) responded to a question regarding receipt of alcohol-related advice from a VA provider in the past year, and to two questions assessing patient ratings of their VA provider and overall VA health care. Response rates to the long-form SHEP were 55%, 53%, and 51% in 2009, 2010 and 2011, respectively. The Institutional Review Board of the VA Puget Sound Healthcare System approved this study.

Measures

Exposure of Interest: Receipt of brief intervention

Receipt of brief intervention was defined as a “yes” response to the following question: “In the past 12 months, has a VA doctor or other VA health care provider advised you about your drinking (to drink less or not to drink alcohol)?” This question has previously been used as a proxy for brief intervention because alcohol-related advice is a central component of evidence-based brief intervention.^{33,47}

Primary Outcomes: Patient-reported indicators of quality of care

The following patient-reported indicators of care quality comprised the primary study outcomes: 1) patient ratings of their VA provider and, 2) patient ratings of their overall VA health care. We assessed these outcomes using the questions, “Using any number from 0 to 10, where 0 is the worst personal doctor/nurse possible and 10 is the best personal doctor/nurse possible, what number would you use to rate your personal VA doctor/nurse?” and “Using any number from 0 to 10, where 0 is the worst healthcare possible and 10 is the best healthcare possible, what number would you use to rate all your VA healthcare in the last 12 months?” Potential scores ranged from 0-10, which we dichotomized ≥ 9 according to CAHPS guidelines to indicate high quality.³⁰ The 2010 and 2011 long-form SHEP questions differed from those in the 2009 version only by prompting patients to rate their “VA doctor/nurse” and “VA healthcare,” rather than their “doctor/nurse” and “overall healthcare.”

Potential Confounders and other Predictor Variables

For each respondent, we abstracted the following sociodemographic variables based on their association to both receipt of brief intervention and patient-reported quality of care ratings^{30,32-36}: age, gender, race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, other), educational attainment (less than high school; high school, General Educational

Development Test [GED], or two-year degree; four-year degree; than 4-year degree), and SF-1 self-reported health status (poor, fair, good, very good or excellent). Previous studies have demonstrated an association between higher AUDIT-C scores and the likelihood of receiving brief intervention,³⁴⁻³⁶ and we hypothesized that severity of unhealthy use is associated with patient reported quality of care ratings. Thus, we categorized the severity of each respondent's unhealthy alcohol use as mild, moderate, severe, or very severe using previously established AUDIT-C ranges of 3/4-5, 6-7, 8-9, and 10-12, respectively.⁴⁷

Statistical Analysis

We first described respondent characteristics of the overall sample. We then compared those characteristics between respondents who did and did not report receipt of brief intervention using Student's t-tests and chi-square tests to compare differences in continuous and categorical variables, respectively.

To estimate the association between the exposure of interest and the primary outcomes, we performed both unadjusted and adjusted analyses. In unadjusted analyses, we used chi-square tests to compare the prevalence of reporting high quality of care between respondents who did and did not report receipt of brief intervention. In adjusted analyses, we used generalized estimating equations with binomial family and logit link to report the predicted prevalence of reporting high quality of care between respondents who did and did not report receipt of brief intervention. In adjusted analyses, we included the following covariables due to expected confounding^{30,32-36}: age, gender, race, education, self-reported health status, and AUDIT-C risk category. All models were clustered to account for correlation of outcomes at the facility level.

Because of missing race (2.5%) and education (2.2%) data, we performed a sensitivity analysis by performing logistic regression with multiple imputations prior to any modeling by

using the fully conditional specification method.⁴⁸ We generated 10 imputed datasets and combined the modeling results across these imputed datasets to obtain final estimates. Though providers can offer brief intervention to any patient with alcohol consumption regardless of AUDIT-C score, VA's performance measure incentivizes brief intervention only for patients who screen positive with AUDIT-C scores ≥ 5 , and an electronic clinical reminder prompts providers to offer brief intervention to all patients with AUDIT-C scores ≥ 5 .^{18,49} Therefore, we performed an additional analysis among the subgroup of respondents with AUDIT-C scores ≥ 5 to evaluate the association between receipt of brief intervention and the primary outcomes among respondents for whom brief intervention is incentivized in VA. We considered a two-tailed p-value less than 0.05 to be statistically significant and used Stata version 12.0 (StataCorp LP, College Station, TX) for all analyses.

RESULTS

Of 66,311 unique respondents who completed the SHEP between 2009 and 2011, 10,612 (16%) screened positive for unhealthy alcohol use and met all inclusion criteria (Figure 2). Forty-three percent of this sample reported receipt of brief intervention in the preceding 12 months.

The mean age of the study sample was 64 years; 96% were male, 81% were non-Hispanic white, 92% had at least a high school degree, GED, or 2-year degree, and 70% rated their health as good, very good or excellent (Table 1). Compared to veterans who did not report receipt of brief intervention, those who reported receipt of brief intervention were younger (61 vs. 67 years), had lower educational attainment, and were less likely to be female, non-Hispanic white, and to rate their health as good, very good, or excellent ($p < 0.001$, all comparisons; Table 1).

Sixty-one percent of the sample screened positive for mild unhealthy alcohol use, and 21%, 11%, and 8% of the sample screened positive for moderate, severe, and very severe unhealthy alcohol use, respectively (Table 1). Compared to veterans who did not report receipt of brief intervention, those who reported receipt of brief intervention were more likely to screen positive for moderate (27% vs. 16%, $p < 0.001$), severe (17% vs. 6%, $p < 0.001$), and very severe unhealthy alcohol use (14% vs. 3%, $p < 0.001$).

Eighty-four percent of the sample rated their provider as high quality, and 79% rated their VA healthcare as high quality (Table 2). Compared to veterans who did not report receipt of brief intervention, those who reported receipt of brief intervention were more likely to rate both their provider (85% vs. 83%, $p < 0.01$) and their overall VA healthcare (80% vs. 78%, $p < 0.01$) as high quality. In multivariable models, compared to veterans who did not report receipt of brief intervention, those who reported receipt of brief intervention were more likely to rate both their

provider (87% vs. 82%, $p<0.01$) and their overall VA healthcare (83% vs. 76%, $p<0.01$) as high quality. These results were not significantly different in sensitivity analyses after multiple imputations of missing race and education data.

Fifty-eight percent of the sample had AUDIT-C scores ≥ 5 and were included in subgroup analyses of respondents for whom brief intervention was incentivized in the VA. Among these respondents, 58% reported receipt of brief intervention in the preceding 12 months. The sociodemographic characteristics, health status, and AUDIT-C risk categorizations of this subgroup were similar in comparison to the overall sample (Supplemental Table 2). Comparisons of these characteristics between respondents who did and did not report receipt of brief intervention were also similar to the overall sample.

Eighty-three percent of the subgroup rated their provider as high quality, and 78% rated their VA healthcare as high quality (Table 2). Compared to veterans who did not report receipt of brief intervention, those who reported receipt of brief intervention were more likely to rate both their provider (85% vs. 81%, $p<0.001$) and their overall VA healthcare (80% vs. 75%, $p<0.001$) as high quality. In multivariable models, compared to veterans who did not report receipt of brief intervention, those who reported receipt of brief intervention were more likely to rate both their provider (86% vs. 79%, $p<0.01$) and their overall VA healthcare (81% vs. 73%, $p<0.01$) as high quality.

DISCUSSION

Results from this cross-sectional analysis among veterans with unhealthy alcohol use demonstrate that receipt of alcohol-related advice—a key component of efficacious brief intervention⁹—was associated with patient-reported indicators of high quality care. These findings were robust in analyses limited to veterans for whom brief intervention was specifically incentivized within the VA (AUDIT-C ≥ 5). Furthermore, they are consistent with those of a previous study in a more limited population,²⁶ and importantly, are in opposition to providers' concerns that delivering such advice may adversely affect patients' perceptions of their care.

These findings are also consistent with several survey studies that have assessed patient perceptions of alcohol-related interventions.⁵⁰⁻⁵² A previous study of general outpatients receiving care at a VA facility found that greater than 80% of respondents were not “embarrassed, upset, annoyed or uncomfortable” by answering questions about their alcohol use,⁵² and a similar analysis among a small sample of patients, a majority of whom were black women receiving care at an outpatient primary care clinic in the southern U.S., found that patients had positive and supportive opinions regarding the role of alcohol screening in the clinical setting.⁵³ Eighty-one percent of general practice patients surveyed in Finland agreed that provider-delivered alcohol-related discussions were helpful,⁵⁰ and another study among Australian general practice patients found that highly satisfied patients were more likely to report a previous discussion with their provider about alcohol use.⁵¹

Population-based screening for unhealthy alcohol use, followed by brief intervention for those who screen positive, is widely recommended for general medical outpatients¹¹⁻¹³ and has been established as a standard of preventive care by the Affordable Care Act.⁵⁴ Additionally, screening for unhealthy alcohol use followed by brief intervention is now incentivized through

the VA and several other health care systems,^{16,18,27} and is a reimbursable prevention strategy by the Centers for Medicare & Medicaid Services.^{55,56} Despite this, implementation of these strategies has remained a challenge¹⁴⁻¹⁶ and delivery varies widely across settings.¹⁷ Findings from this study can help address system and provider-level barriers to such implementation. First, reassuring providers that such conversations are not a risk to their patient relationships may help improve delivery of these interventions in the clinical setting. Second, patient-reported indicators of care quality are rapidly being adopted for use in comparative performance metrics and reimbursement decisions in a wide variety of settings.⁵⁷ Health care delivery systems should not be dissuaded from implementing evidence-based strategies to address unhealthy alcohol use out of concern for harming reimbursement or quality ratings.

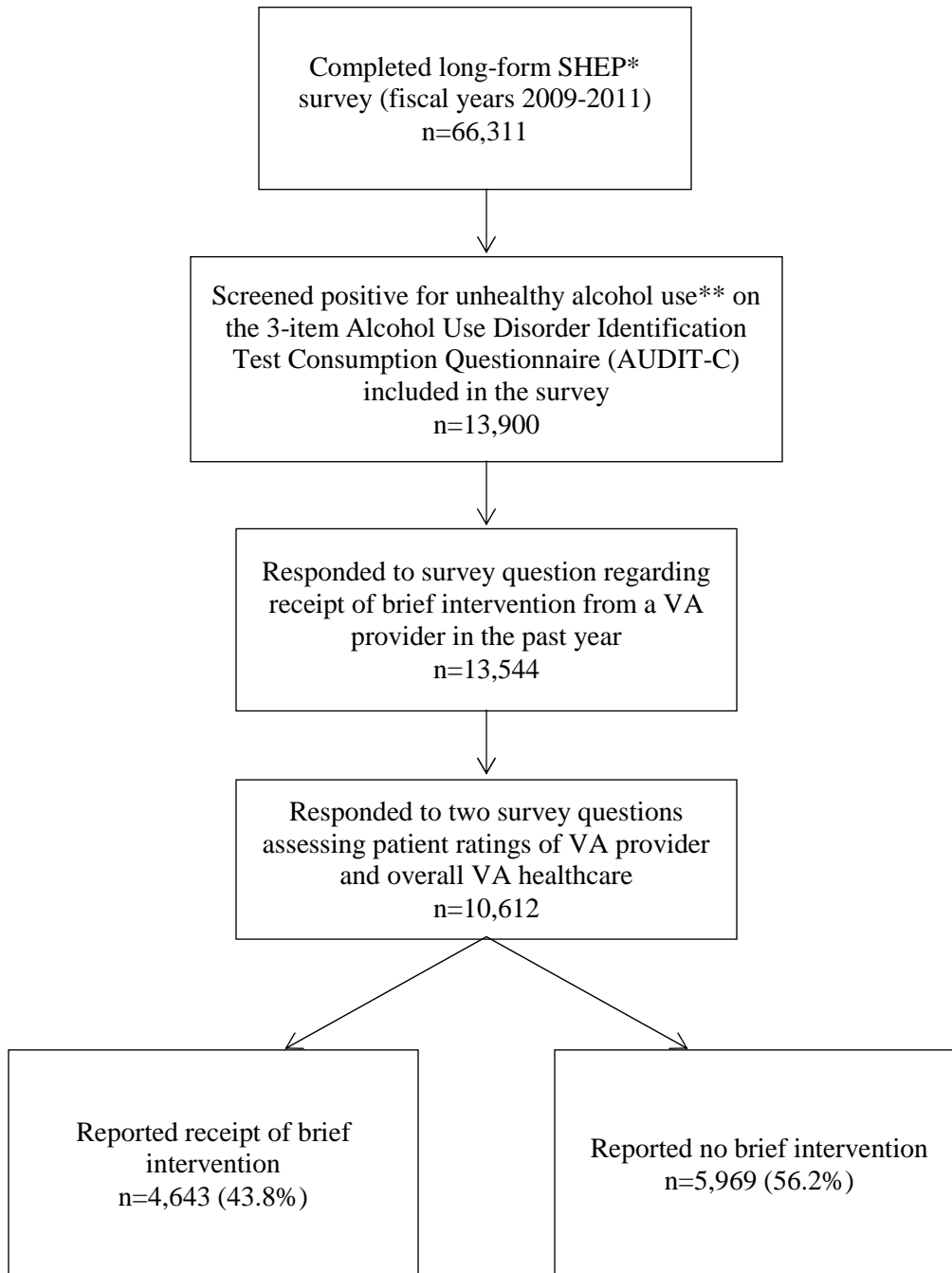
Findings from this study suggest that receipt of brief intervention in the VA is associated with greater likelihood of veterans perceiving high quality care. However, it is unknown whether delivery of brief intervention actually improves patients' perceptions of their care. Moreover, it is unknown whether perceptions of care quality influence drinking outcomes after receipt of brief intervention. A recent analysis of the early implementation of population-based screening and brief intervention in the VA found that provider-documented delivery of brief intervention was not associated with resolution of unhealthy alcohol use among outpatients who had repeat alcohol screening.⁴⁹ Future studies are needed to determine whether the effectiveness of brief intervention delivered in routine care varies based on patient perceptions of quality.

There are several important limitations of this study to consider. First, while we observed a strong association between reported receipt of brief intervention and patient-reported quality of care, the cross-sectional nature of this study limits our ability to make causal inferences. Second, these findings may be affected by non-response bias; an inherent limitation of any survey-based

analysis. Additional studies may be needed among a more generalized sample of VA patients and in other outpatient settings (e.g., non-VA clinics). Third, these results may have been confounded by a halo effect, whereas respondents who already had favorable perceptions of their provider or their VA health care may have been more likely to recall or report receipt of brief intervention. Fourth, this study is vulnerable to misclassification bias if respondents incorrectly report or fail to report receipt of brief intervention. Fifth, we used receipt of alcohol-related advice as a proxy for brief intervention. Although critically important and a consistent element of efficacious brief intervention, alcohol-related advice is only one component of brief intervention, and we were unable to assess associations between patient perceptions of care and receipt of other potentially important aspects and mechanisms of delivery of brief intervention, such as feedback linking drinking to health status and motivational interviewing, respectively. Sixth, while we adjusted for all known confounders using data available to us in the SHEP survey, this was an observational study and these results may be affected by residual confounding. Lastly, we know that some veterans who screen positive for unhealthy alcohol use on the SHEP survey do not screen positive in clinical settings.⁵⁸ Thus, we assessed receipt of brief intervention among a number of unhealthy alcohol users who would not have been identified as such by their provider.

In summary, among veteran outpatients with unhealthy alcohol use who responded to a mailed survey, those who reported receipt of brief intervention from a provider in the preceding 12 months were more likely to rate both their provider and VA healthcare as high quality compared to those who did not. These findings should be incorporated into implementation strategies to allay provider concerns and improve the delivery of brief intervention in clinical settings.

Figure 2: Selection of the Study Sample



* SHEP = VA Survey of Healthcare Experiences of Patients

** Unhealthy alcohol use defined based on validated AUDIT-C cut points (score ≥ 3 for women, ≥ 4 for men).^{36,46}

Table 1: Sociodemographics, Alcohol Use Characteristics, and Quality Ratings of Veteran Outpatients with Unhealthy Alcohol Use*

Respondent Characteristic	Total	Alcohol-Related Advice	No Advice	P-value
n (%)	10,612 (100)	4,637(43.7)	5,975 (56.3)	
Age, mean years (SD)	64.2 (12.2)	61.3 (11.0)	66.5 (12.6)	<0.001
Age category, years, n(%)				<0.001
18-39	382 (3.6)	4.0	3.3	
40-59	2,568 (24.2)	30.6	19.2	
60-79	6,440 (60.7)	60.2	61.1	
≥ 80	1,222 (11.5)	5.2	16.4	
Male gender, n (%)	10,197 (96.1)	97.2	95.2	<0.001
Race/ethnicity, n (%)				<0.001
Non-Hispanic white	8,350 (80.7)	75.0	85.1	
Non-Hispanic black	911 (8.8)	12.0	6.3	
Hispanic	656 (6.3)	7.8	5.2	
Other	434 (4.2)	5.2	3.4	
Educational attainment, n (%)				<0.001
< High school	849 (8.2)	9.1	7.5	
High school, GED, or two-year degree	7,367 (71.0)	76.5	66.7	
Four year degree	1,076 (10.4)	7.7	12.4	
> Four year degree	1,091 (10.5)	6.8	13.4	
Health status, n (%)				<0.001
Poor or fair	3,164 (30.0)	36.3	25.1	
Good, very good, or excellent	7,378 (70.0)	63.7	74.9	
AUDIT-C risk groups, n (%)				<0.001
Mild unhealthy alcohol use	6,411 (60.5)	41.7	75.1	
Score 3-4 (women); 4 (men)	4,474 (42.2)	23.7	56.5	
Score 5**	1,937 (18.3)	17.9	18.5	
Moderate unhealthy alcohol use (score 6-7)	2,243 (21.1)	27.4	16.3	
Severe unhealthy alcohol use (score 8-9)	1,157 (10.9)	17.4	5.8	
Very severe unhealthy alcohol use (score 10-12)	801 (7.6)	13.6	2.9	

n = number; *SD* = standard deviation; *AUDIT-C* = Alcohol Use Disorder Identification Test Consumption Questionnaire; *GED* = General Educational Development Test

* Screened positive for unhealthy alcohol use on the 3-item AUDIT-C based on validated cut points (score ≥3 for women, ≥4 for men).

** VA's performance measure incentivizes brief intervention only for patients who screen positive with AUDIT-C scores ≥5, and an electronic clinical reminder prompts providers to offer brief intervention to all patients with AUDIT-C scores ≥5.

Table 2. Prevalence of Reporting High Quality among Veteran Outpatients with Unhealthy Alcohol Use*

Quality Rating	Total	Alcohol-Related Advice	No Advice	P-value
Unadjusted				
Main Analysis				
Rated provider as high quality, n (%)	8,938 (84.2)	85.3	83.4	<0.01
Rated VA healthcare as high quality, n (%)	8,390 (79.1)	80.2	78.1	<0.01
Subgroup Analysis**				
Rated provider as high quality, n (%)	5,100 (83.1)	84.9	80.6	<0.001
Rated VA healthcare as high quality, n (%)	4,778 (77.8)	79.8	75.2	<0.001
Adjusted				
Main Analysis				
Rated provider as high quality	-	86.9 (85.8-88.0)	82.0 (80.8-83.2)	<0.01
Rated VA healthcare as high quality	-	82.7 (81.5-83.9)	75.9 (74.4-77.4)	<0.01
Subgroup Analysis				
Rated provider as high quality	-	85.8 (84.6-87.0)	79.3 (77.8-80.8)	<0.01
Rated VA healthcare as high quality	-	81.3 (79.9-82.7)	73.0 (71.1-75.0)	<0.01

n = number; *AUDIT-C* = Alcohol Use Disorder Identification Test Consumption Questionnaire

Model covariables: Age, gender, race, education, self-reported health status, and AUDIT-C category

* Screened positive for unhealthy alcohol use on the 3-item AUDIT-C based on validated cut points (score ≥ 3 for women, ≥ 4 for men).

** Restricted to respondents with AUDIT-C scores ≥ 5 . VA's performance measure incentivizes brief intervention only for patients who screen positive with AUDIT-C scores ≥ 5 , and an electronic clinical reminder prompts providers to offer brief intervention to all patients with AUDIT-C scores ≥ 5 .

Supplemental Table 1: Alcohol Use Disorder Identification Test Consumption Questionnaire

Question	Answer	Score
How often do you have a drink containing alcohol?		
	Never	0
	Monthly or less	1
	2-4 times a month	2
	2-3 times a week	3
	4 or more times a week	4
How many standard drinks* containing alcohol do you have on a typical day?		
	1 or 2	0
	3 or 4	1
	5 or 6	2
	7 to 9	3
	10 or more	4
How often do you have six or more drinks on one occasion?		
	Never	0
	Less than monthly	1
	Monthly	2
	Weekly	3
	Daily or almost daily	4

*A standard drink is approximately 12 to 14 grams of ethanol, which corresponds to 12 ounces of beer, 5 ounces of wine, or 1.5 ounces of 80-proof liquor.⁵⁹

** Unhealthy alcohol use defined using validated cut points (score ≥ 3 for women, ≥ 4 for men)^{36,46}

Supplemental Table 2: Sociodemographics, Alcohol Use Characteristics, and Quality Ratings of Veteran Outpatients with Unhealthy Alcohol Use included in Subgroup Analyses*

Respondent Characteristic	Total	Alcohol-Related Advice	No Advice	P-value
n(%)	6,139 (100)	3,542 (57.7)	2,597 (42.3)	
Age, mean years (SD)	61.6 (11.0)	60.5 (10.4)	63.3 (11.6)	<0.001
Age category, years, n (%)				<0.001
18-39	241 (3.9)	4.1	3.7	
40-59	1,801 (29.3)	32.9	24.5	
60-79	3,781 (61.6)	59.9	63.9	
≥ 80	316 (5.2)	3.2	7.8	
Male gender, n (%)	6,006 (97.8)	97.9	97.7	0.63
Race/ethnicity, n (%)				<0.001
Non-Hispanic white	4,640 (77.5)	74.7	81.4	
Non-Hispanic black	618 (10.3)	12.1	7.8	
Hispanic	461 (7.7)	8.3	6.9	
Other	268 (4.5)	4.9	4.0	
Educational attainment, n (%)				<0.001
< High school	542 (9.0)	9.1	8.9	
High school, GED, or two-year degree	4,558 (75.9)	78.1	73.0	
Four year degree	485 (8.1)	6.8	9.8	
> Four year degree	418 (7.0)	6.0	8.3	
Health status, n (%)				<0.001
Poor or fair	2,034 (33.3)	37.1	28.2	
Good, very good, or excellent	4,069 (66.7)	62.9	71.8	
AUDIT-C risk groups, n (%)				<0.001
Mild unhealthy alcohol use				
Score 3-4 (women); 4 (men)	-	-	-	
Score 5**	1,937 (31.6)	23.5	42.6	
Moderate unhealthy alcohol use (score 6-7)	2,243 (36.5)	35.9	37.4	
Severe unhealthy alcohol use (score 8-9)	1,157 (18.9)	22.8	13.4	
Very severe unhealthy alcohol use (score 10-12)	801 (13.1)	17.8	6.6	
Rated provider as high quality, n (%)	5,100 (83.1)	84.9	80.6	<0.001
Rated VA healthcare as high quality, n (%)	4,778 (77.8)	79.8	75.2	<0.001

n = number; *SD* = standard deviation; *AUDIT-C* = Alcohol Use Disorder Identification Test Consumption Questionnaire; *GED* = General Educational Development Test

** Restricted to respondents with AUDIT-C scores ≥ 5. VA's performance measure incentivizes brief intervention only for patients who screen positive with AUDIT-C scores ≥5, and an electronic clinical reminder prompts providers to offer brief intervention to all patients with AUDIT-C scores ≥5.

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