

REVIEW

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# A systematic review of substance use screening in outpatient behavioral health settings

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## Abstract

**Objective** Despite the frequent comorbidity of substance use disorders (SUDs) and psychiatric disorders, it remains unclear if screening for substance use in behavioral health clinics is a common practice. The aim of this review is to examine what is known about systematic screening for substance use in outpatient behavioral health clinics.

**Methods** We conducted a PRISMA-based systematic literature search assessing substance use screening in outpatient adult and pediatric behavioral health settings in PubMed, Embase, and PsycINFO. Quantitative studies published in English before May 22, 2020 that reported the percentage of patients who completed screening were included.

**Results** Only eight articles met our inclusion and exclusion criteria. Reported prevalence of screening ranged from 48 to 100%, with half of the studies successfully screening more than 75% of their patient population. There were limited data on patient demographics for individuals who were and were not screened (e.g., gender, race) and screening practices (e.g., electronic versus paper/pencil administration).

**Conclusions** The results of this systematic review suggest that successful screening for substance use in behavioral health settings is possible, yet it remains unclear how frequently screening occurs. Given the high rates of comorbid SUD and psychopathology, future research is necessary regarding patient and clinic-level variables that may impact the successful implementation of substance use screening.

*Trial registry* A methodological protocol was registered with the PROSPERO systematic review protocol registry (ID: CRD42020188645).

**Keywords** Screening, Substance use, Substance use disorder, Behavioral health, Outpatient

## Introduction

Substance use disorders (SUD) pose a substantial societal burden in the United States. In 2020 alone, an estimated 28.3 million people aged 12 or older met criteria for a

past-year alcohol use disorder, while 18.4 million people aged 12 or older experienced a past-year illicit drug use disorder [1]. Risky substance use and SUD are associated with substantial disability and mortality, with an estimated 480,000 tobacco-related deaths and 95,000 alcohol-related deaths annually in the United States [2, 3]. Of particular concern, drug-related overdose deaths have risen over the past years, increasing from 70,630 deaths in 2019 to 92,000 deaths in 2020 [4, 5].

Prior research has established psychopathology as a significant risk factor for developing a SUD [6–9]. For example, individuals with depression are approximately

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2 times more likely to develop a SUD, and those with attention deficit hyperactivity disorder exhibit a 2.3 times greater risk [10]. Furthermore, individuals with one or more psychiatric diagnoses experience greater SUD severity [11, 12]. The sequelae of co-occurring SUD and psychiatric disorders include increased odds of additional psychopathology [15], hospitalizations [16], suicide attempts [13, 17, 18], overdose [19–21], criminal behavior [22], and homelessness [23]. Additionally, adults with co-occurring disorders report overall lower quality of life [24] and lower social and occupational functioning [13, 25, 26].

Despite the imposed burden of comorbid SUD and psychopathology, in 2019, 51.4% of individuals in the United States with co-occurring disorders received no treatment, 38.7% received mental health treatment only, 7.8% received treatment for both mental health and SUD, and 1.9% received SUD treatment only (27). Given that many treatment-seeking individuals with co-occurring SUD and psychopathology obtain mental health treatment rather than substance use treatment, screening for substance use concerns in behavioral health settings is necessary to identify individuals at the greatest risk for maladaptive outcomes.

To this end, both the Substance Abuse and Mental Health Services Administration (SAMHSA) and the National Institute for Health and Clinical Guidance (NICE) have urged mental health providers to routinely administer patient self-report questionnaires to screen for substance use [28, 29]. Most efforts to integrate substance use screening into clinical care have focused on primary care settings [30–33]. As such, the success of substance use screening tools in other outpatient settings remains unclear. Because behavioral health clinics generally have both fewer ancillary supports to assist with screening compared to primary care, as well as high staff turnover rates [34, 35], research is needed on screening for substance use in these settings. Hence, we aim to summarize the extant literature on systematic screening for substance use in behavioral health, with a focus on the prevalence of screening within these clinics, characteristics of the screening tools used, and screening practices.

## Methods

A methodological protocol was registered with the PROSPERO systematic review protocol registry (ID: CRD42020188645).

### Search strategy

We conducted a search based upon Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines of peer-reviewed literature within the PubMed, Embase, and PsycINFO databases through

May 22, 2020 with no restrictions for the start date. We examined both the prevalence and frequency of substance use screening in outpatient behavioral health clinics as well as the characteristics of the outpatient behavioral health clinics that screen for substance use. We searched each database using various combinations of search terms that can be found in the Additional file 1. Bibliographies of reviewed articles were also examined for additional studies to ensure that no relevant articles were omitted.

Inclusion criteria were quantitative studies examining substance use screening in outpatient adult and pediatric behavioral health clinics published in English. This included general psychiatric clinics, community mental health organizations, university counseling centers, and other specialty services. Studies were only included if they implemented systematic screening for substance use and reported the percentage of patients who completed the screener. Editorials, commentaries, opinion papers, chapters, and research studies that recruited participants to complete screening tools were excluded. Studies examining screening for substance use only in integrated behavioral health settings within primary care, emergency rooms, or inpatient settings were also excluded. If studies examined screening for substance use in behavioral health-only clinics alongside integrated behavioral health settings they were included if they stratified screening rates by clinic type.

### Selection of studies

Two reviewers independently screened the titles and abstracts of all papers. Any disagreements were resolved by consensus, and irrelevant titles were excluded. A record was kept of all irrelevant and duplicate articles. The full text of the remaining papers was reviewed by the two investigators and included/excluded. A third senior investigator reviewed all the included papers to confirm they met inclusion/exclusion criteria.

### Data extraction, analysis, and synthesis

Data were extracted from the quantitative studies by one reviewer and discussed with the senior reviewer. The following variables were extracted: Setting, sample size, percentage of patients screened, patient demographics, language of screening tool, screener administered, substances screened, date of study, frequency of screening, and method of screening (computer, paper, self-report, clinician report, etc.).

## Results

Our initial search yielded 362 non-duplicate articles (Fig. 1). Eighty-four articles were determined to be potentially relevant and therefore reviewed in full. Of the

84 potentially relevant articles, 76 articles were excluded based on eligibility criteria (see Fig. 1). Eight articles were included in the final review (Table 1). The most common reasons for exclusion after full-text review were that the article reported on data from a sample recruited for a research study (N=23), the authors did not report the percentage of patients screened (N=13), or screening was implemented in a non-behavioral health setting (N=11). The 8 articles included in this systematic review were published between 1992 and 2018. The sample sizes ranged from 88 to 22,956 screened patients.

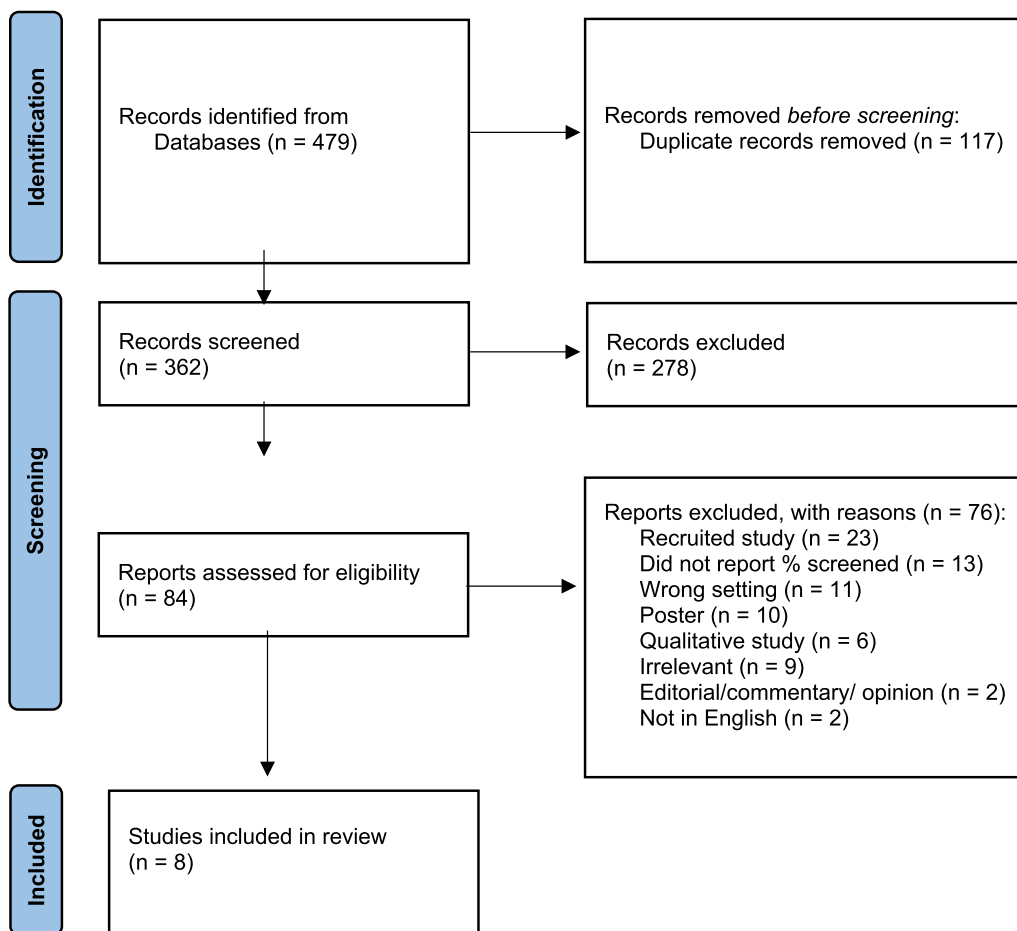
**Setting**

Six of the eight studies were conducted in behavioral health clinics within a larger healthcare system, two of which took place in Veterans Affairs (VA) facilities [36–41]. The two studies that were not conducted in healthcare systems were conducted in a university counseling center [42] and community mental health organizations [43]. All studies were conducted in the United States. Four studies were single-site [37, 40–42], three studies

included multiple sites ranging from 2 to 48 [36, 39, 43], and one study did not report the number of sites [38]. The majority of the studies (62.5%) were conducted in adult clinics [37, 39, 40, 42, 44], with one study focused on college students [42]. Two studies included pediatric patients [36, 43], and one study did not report age [41].

**Screener and substances screened**

All of the studies screened for alcohol, the majority screened for drugs (N=6) [36, 37, 39, 40, 42, 43], and half of the studies screened for tobacco (N=4) [36, 39, 40, 42]. Of those that screened for drugs, two studies administered screeners which did not differentiate type of substance [36, 37]. Of the remaining four, all specifically queried about marijuana/cannabis [39, 40, 42, 43], and three screened for other drugs, including opioids [39, 40, 42]. A range of 1 to 5 screeners was used to assess for substance use. Additionally, one study administered both a pre-screening instrument and a screening instrument [42]. The most commonly used screeners were the Alcohol Use Disorders Identification Test-Concise



**Fig. 1** PRISMA diagram

**Table 1** Studies reporting systematic screening for substance use in outpatient behavioral health settings

Author, Year	Setting description (number of settings, pediatric/adult)	Screening	Substances Screened	Frequency of Screening	Administration	Method of Screening	% Screened	N (screened)
Denering and Spear, 2012	University counseling center (1, adult)	AUDIT-C* (pre-screen) ASSIST* (screen)	AUDIT-C*: Alcohol ASSIST*: Tobacco, alcohol, cannabis, cocaine, amphetamine, inhalants, sedatives, hallucinogens, opioids, other drugs	Intake	AUDIT-C*: self ASSIST*: clinician	Not Reported	100.0%	AUDIT-C*: 6,772 ASSIST*: 1534
Gabel, Radigan, Wang and Sederer, 2011	Outpatient and day treatment (48, pediatric)	CRAFT Single cigarette use question Single drug use question	Cigarettes, alcohol, "street" drugs	CRAFT: intake and 1 year Single cigarette and drug question: quarterly	Self	Not Reported	Smoking: 85.0% Alcohol/drug: 84.0%	2095
Karno, Granholm and Lin, 2000	Outpatient Veterans Affairs Mental Health Clinic (1, adult)	AUDIT* CAGE*	Alcohol, "drug use"	Intake	Self	Paper	74.9%	197
King, Beehler, Wade, Buchholz, Funderburk, Lilienthal and Vair, 2018	Veterans Affairs outpatient and integrated care (Not Reported)	AUDIT-C* CAGE*	Alcohol	Intake	Not Reported	Not Reported	AUDIT-C: 80.4% CAGE: 00.0%	22,956 at least 1 screen
Ramo, Bahorik, Delucchi, Campbell and Satre, 2018	Outpatient and partial hospitalization (2, adult)	ASSIST*	Tobacco, alcohol, marijuana, prescription sedative/hypnotic pills, cocaine, amphetamines, opioids, hallucinogens, ecstasy/ MDMA	Intake	Self	Computer	48.0%	405
Satre, Wolfe, Eisen-drath and Weisner, 2008	Outpatient (1, adult)	Electronic Health Inventory If positive: SMAST*	Alcohol, cannabis, cocaine, amphetamines, hallucinogens, ecstasy sedatives opioids, and tobacco	Intake	Self	Computer	75.0%	422
Silverman, O'Neill, Cleary, Barwick and Joseph, 1992	Outpatient (1, adult)	SMAST*	Alcohol	Intake	Self	Not Reported	88.0%	88
Stanhope, Manuel, Jessell and Halliday, 2018	Community health organizations (27, adult)	CRAFT UNCOPE	Alcohol, marijuana, "anything else to get high"	Not Reported	Not Reported	Not Reported	93.5%	2873

\* Screener abbreviations

AUDIT alcohol use disorders identification test; CAGE cut down, annoyed, guilty, eye opener; ASSIST alcohol, smoking and substance involvement screening test; SMAST short michigan alcoholism screening test

(AUDIT-C) [38, 42, 45], the CRAFFT [36, 43, 46], the Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) [39, 42, 47], and the Short Michigan Alcohol Screening Test (SMAST) [40, 41, 48] (all N=2).

### Frequency and methods of screening

The majority of studies reported screening only at intake (N=6) [37–42]. One clinic implemented different screening instruments at intake, quarterly, and one year [36], and Stanhope et al. did not report the frequency of their screening across community mental health organizations. Of the eight studies, five relied solely on self-administration [36, 37, 39–41], one on both self- (prescreen) and clinician- (screen) administration [42], and two did not report how the screening was administered [38, 43]. Additionally, although the majority (N=5) of authors did not report how information was collected [36, 38, 41–43], two studies utilized an electronic screen [39, 40] and one study relied on paper and pencil [37]. Finally, none of the studies reported the language of their screening instrument(s) [37].

### Screening rate

One study reported screening all patients [42]. The screening rates of the remaining studies ranged from 48 to 93.5% of patients. Screening in adult-only clinics ranged from 48 to 100% of patients [37–40, 42] while screening from clinics with adult and pediatric patients ranged from 84 to 93.5% [36, 43]. The screening rate using an electronic screen ranged from 48 to 75% of patients [39, 40], and the rate for paper/pencil was 74.9%.

### Demographics

#### Gender

Five studies reported on the gender of screened patients [36, 37, 39, 40, 43], and one study reported on gender across the total study population (patients who did and did not complete the screening) [38]. Of those that reported on the gender of screened patients, the range was 30 to 86% male. In two studies that did not report the gender across the total study population, the studies did report that there were no significant gender differences between patients who did and did not complete screening [40, 43].

#### Age

Four studies reported the mean age of screened patients, with a range of 16.6 to 42.9 years [37, 39, 40, 43]. Three studies reported mean age across the total study population, with a range of 36.1 to 53.5 years [38–40]. One additional study that did not report mean age across the total study population reported no significant difference in

mean age between screened patients and the total study population [43].

#### Race

The three studies that reported on the race of screened patients included predominantly white patients, with these participants ranging from 52.8 to 72% of the sample [39, 40, 43]. The next most represented race was Asian, ranging from 9 to 10.5% of the sample. No studies reported race across the total study population; however, two studies reported no significant racial differences between patients who did and did not complete screening [40, 43].

#### Ethnicity

The two studies that reported on the ethnicity of screened patients included predominantly non-Hispanic patients, with these patients ranging from 73 to 93% of the sample [40, 43]. The one study that reported ethnicity across the total study population (patients who did and did not complete screening) was also largely non-Hispanic (94.2%) [38]. Two additional studies reported no significant differences in ethnicity between patients who did and did not complete screening; however, they did not report ethnicity type for the study population [40, 43].

#### Psychiatric comorbidities

Though two studies provided descriptive information on psychopathology, neither compared psychopathology between those who were and were not screened in the clinic [37, 38]. Karno et al. reported rates of depressive disorder (48%), anxiety disorder (15%), bipolar disorder (13%), and schizophrenia/ schizoaffective disorder (11%) in screened patients. King and colleagues found that 15.1% of all clinic patients had a trauma/ stressor-related disorder (including post-traumatic stress disorder), and 12.9% of all clinic patients had a mood disorder.

### Conclusions

Our aim in this review was to determine the prevalence and the characteristics of screening practices for substance use in outpatient behavioral health clinics. Though we identified only 8 studies that met review criteria, half of these studies reported screening more than 75% of their patient population [36, 41–43].

The screening rates in the identified studies are comparable to those reported in a recent examination of substance use screening in primary care settings, which found that 71.8% of eligible patients were screened after implementation efforts [49]. However, whether existing research on screening for substance use represents standard practice in all behavioral health clinics

remains unclear given limited reporting on this practice. While the 2020 National Mental Health Services Survey (N-MHSS) reported that approximately 54% of the 4,941 surveyed outpatient mental health treatment facilities offer screening for tobacco use, it did not specify whether this screening is systematic and routine and did not report on screening for non-nicotine substances (50). Furthermore, the intent to screen for substance use does not always translate into clinical practice. A large survey found that although 93.1% and 78.9% of mental health clinic directors reported having screening guidelines for alcohol and illicit substance use, respectively, only 66.6% and 57.8% of clinic staff reported conducting said screening [51].

Several patient- and clinic-level variables influence the successful implementation of systematic screening. Unfortunately, few studies in the current review reported patient demographic information. We were therefore unable to identify specific patient demographics associated with a high prevalence of screening for substance use or demographic differences between patients who were and were not screened to help identify patient groups who did not complete screening. This is notable since research from the primary care setting has found differences in screening for substance use based on demographics. For example, Black and Hispanic patients and adults over the age of 65 may require more assistance to complete electronic screening for substance use due to problems with comprehension or technical issues [52]. In light of increasing overdose deaths among Black and Hispanic youth [53], research examining the barriers to screening for substance use in particular demographic groups is needed to ensure equitable care.

Clinic factors that influence the successful implementation of screening center around the method of screening administration. For most studies in our review, screening tools were administered as patient self-report [36, 37, 39–41]. This is consistent with recent research in primary care and emergency department settings showing increased patient comfort with self-report screening compared to clinician-administered screening [54–56], particularly amongst individuals who belong to groups who are more stigmatized for substance use [52, 57, 58]. Another notable finding of our review was the omission of data regarding screening tools (paper and pencil versus electronic) and language of screening. A review of screening in primary care found that electronic questionnaires using patient self-report in both pediatric and adult settings improved data quality and completion time, decreased costs, and were preferred by patients. However, the use of electronic questionnaires also led to increased privacy concerns and access challenges [59]. Electronic measures, particularly those linked to the

electronic medical record, may also result in racial and ethnic disparities in screening completion rates [60]. Additional research in the behavioral health setting is needed to determine patient and clinician preferences regarding the method of screening, particularly for more stigmatized conditions such as substance use [61, 62].

Finally, the timing and frequency of screening is another important factor to consider during implementation. Most studies in our systematic review reported screening patients for substance use only at intake [36–43]. Although screening at intake identifies patients who may benefit from SUD treatment [63], ongoing screening and progress monitoring improves engagement in SUD treatment and SUD outcomes [64, 65], and a recent consensus panel organized by SAMHSA recommended screening patients with psychiatric disorders for substance use annually [66]. Thus, future research should examine the prevalence and success of repeated screening for substance use.

The results of our review need to be considered in light of methodological limitations. The generalizability of the findings may be limited given the small number of eligible manuscripts. Moreover, several of these studies were missing information on patient- and clinic-level variables related to implementation that was recently identified as necessary to report on for studies evaluating the use of patient self-report questionnaires to improve the methodological quality, transparency, and applicability of the findings [67]. Hence it was difficult to conclude what variables contributed to the successful implementation of screening for substance use in the behavioral health setting. Furthermore, of those studies that did report patient demographics, the majority of the subjects were adults, white, and non-Hispanic. As such, the results may not be generalizable to pediatric or more diverse racial and ethnic groups. Additionally, to narrow the scope of the current review, we excluded manuscripts that examined substance use screening in integrated behavioral health clinics within primary care. Although implementation in these settings is important to investigate to better understand the overall landscape of screening for substance use in settings that provide behavioral health care, integrated behavioral health clinics likely face different barriers and facilitators. Lastly, more clinics may be systematically screening for substance use and not reporting their findings in published results. Thus, this topic is at risk for publication bias as behavioral health clinics that have struggled to implement systematic screening for substance use may not pursue publication.

In summary, the results of our review indicate that screening for substance use in the outpatient behavioral health setting can be successfully implemented at initial intake. Our review highlights the need for further

examination of patient- and clinic-level variables that may impact the successful implementation of screening in behavioral health. Future research should include these variables to inform implementation efforts, ensure equity in screening, and achieve consistency with recent reporting guidelines [67].

#### Abbreviations

SUD	Substance use disorder
SAMHSA	Substance Abuse and Mental Health Services Administration
NICE	National Institute for Health and Clinical Guidance
PRISMA	Preferred reporting items for systematic reviews and meta-analyses
VA	Veterans affairs
AUDIT	Alcohol use disorders identification test
CRAFFT	Car, relax, alone, forget, friends, trouble
ASSIST	Alcohol, smoking and substance involvement screening test
SMASST	Short Michigan alcohol screening test
N-MHSS	National Mental Health Services Survey

#### Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s13722-023-00376-z>.

**Additional file 1.** Search terms used in the systematic review of substance use screening in outpatient behavioral health settings.

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#### Author contributions

DW, TW, VR, and AY contributed to the development of the study protocol. DW screened the titles and abstracts of all papers. TW and AY reviewed included papers. VR extracted data from quantitative studies. All authors provided contributions to the writing of the manuscript. All authors read and approved the final manuscript.

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#### Availability of data and materials

All data generated or analyzed during this study are included in this published article [and its Additional information files].

#### Declarations

#### Ethics approval and consent to participate

Not applicable.

#### Consent for publication

Not applicable.

#### Competing interests

AY is a consultant to the Gavin House and BayCove Human Services (clinical services), as well as the American Psychiatric Association's Providers Clinical Support System Sub-Award. TW has been a consultant for Neurovance/Otsuka, Ironshore, KemPharm, and Vallon, and he has a licensing agreement with Ironshore for a copyrighted diagnostic questionnaire that he co-owns (Before School Functioning Questionnaire). TW also serves as a clinical consultant to the US National Football League (ERM Associates), US Minor/Major League Baseline, Phoenix House/Gavin Foundation, and Bay Cove Human Services. There are no disclosures to report for the remaining authors.

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