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The Concurrent Validity of the Problem Oriented Screening Instrument for Teenagers (POSIT) Substance Use/Abuse Subscale in Adolescent Patients in an Urban Federally Qualified Health Center

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Abstract

Background: The Problem Oriented Screening Instrument for Teenagers (POSIT)’s substance use/abuse subscale has been validated with high school students, adolescents with criminal justice involvement, and adolescent substance use treatment samples using the Diagnostic and Statistical Manual (DSM)-III-R and DSM-IV. This study examines the concurrent validity of the POSIT’s standard 17-item substance use/abuse subscale and a revised, shorter 11-item version using DSM-5 Substance Use Disorder diagnoses.

Methods: Adolescents ($N=525$; 93% African American, 55% female) 12-17 years of age awaiting primary care appointments at a Federally Qualified Health Center in Baltimore, Maryland completed the 17-item POSIT substance use/abuse subscale and items from a modified World Mental Health-Composite International Diagnostic Interview corresponding to DSM-5 alcohol use disorder (AUD) and cannabis use disorder (CUD). Receiver operating characteristic curves, sensitivities, and specificities were examined with DSM-5 AUD, CUD, and a diagnosis of either or both disorders for the standard and revised subscales using risk cutoffs of either 1 or 2 POSIT “yes” responses.

Results: For the 17-item subscale, sensitivities were generally high using either cutoff (range. 0.79-1.00), although a cutoff of 1 was superior (sensitivities were 1.00 for AUD, CUD, and for either disorder). Specificities were also high using either cutoff (range. 0.81-0.95), but were higher using a cutoff of 2. For the 11-item subscale, a cutoff of 1 yielded higher sensitivities than a cutoff

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AUTHOR CONTRIBUTIONS

Kelly, Gryczynski, O’Grady, Mitchell, Kirk, and Schwartz contributed to the conceptualization of the study, to the writing of the research protocol, and all phases of manuscript preparation. Kelly and O’Grady assisted with data analysis and interpretation of results. All authors assisted with manuscript revisions and approved the final manuscript as submitted.

of 2 (ranges for 1 and 2. 0.96-1.00 and 0.79-0.86, respectively). Specificities for this subscale were higher using a cutoff of 2 (ranges for 1 and 2. 0.82-0.89 and 0.89-0.96, respectively).

Conclusions: Findings suggest that the POSIT's substance use/abuse subscale is a potentially useful tool for screening adolescents in primary care for AUD or CUD using a cutoff of 1 or 2. The briefer, revised subscale may be preferable to the standard subscale in busy pediatric practices.

Keywords

Adolescents; Screening; DSM-5; Substance use disorder

INTRODUCTION

Substance use among adolescents is a major public health problem in the U.S. According to the 2014 National Survey on Drug Use and Health, 11.5% of 12-17 year olds had used alcohol in the previous month and 7.4% had used marijuana.¹ Further, 5.0% of adolescents met diagnostic criteria for a substance use disorder (SUD) for alcohol or illicit substances in the previous year. Use of alcohol or other drugs (AOD) is associated with mental and physical health problems, poor school performance, violence, and juvenile justice involvement.²⁻⁷ Additionally, substance use during adolescence is associated with increased risk of developing a SUD in adulthood.^{8,9} These factors emphasize the importance of identifying and treating AOD use among adolescents to interrupt the progression of substance use problems.

Federally Qualified Health Centers (FQHCs) provide comprehensive health services throughout the U.S. —including primary care, mental health, and substance use—to millions of patients a year regardless of ability to pay.^{10,11} FQHCs are located in medically underserved areas and patients are predominantly low-income and underinsured or uninsured. Despite recommendations by the American Academy of Pediatrics and the World Health Organization that pediatric healthcare providers routinely screen youth for use of alcohol and other drugs,^{12,13} only about half (49.1%) of FQHCs screen adolescents as recommended.¹⁰ Time constraints and lack of standardized assessments have been cited as top barriers to screening adolescents for substance use.^{14,15}

Several screening measures have been found to be reliable and valid for use with adolescents.¹⁶⁻¹⁹ The Problem Oriented Screening Instrument for Teenagers (POSIT) is a 139-item measure that identifies potential problems in ten functional areas.¹⁶ Its 17-item substance use/abuse subscale was found to be reliable and valid with adolescents referred to an assessment service for substance use evaluation,²⁰ adolescent patients in primary care,²¹ high school students,²² youth involved in the criminal justice system,^{23,24} and adolescents in drug treatment.^{22,25} In addition to U.S. samples, the POSIT has been used with students in Mexico,²⁶ Germany,²⁷ and South Korea.²⁸

To date, the POSIT's substance use/abuse subscale has been validated using criteria for substance abuse or dependence from the Diagnostic and Statistical Manual (DSM)-III-R^{20,22,29} and DSM-IV.^{24,30,31} The 5th edition of the DSM (DSM-5)³² was published in 2013

and includes major revisions to substance use diagnoses. These revisions: 1) combine DSM-IV abuse and dependence criteria into one spectrum diagnosis of substance use disorder; and 2) revise diagnostic criteria to omit legal problems and include an item on craving for each substance and cannabis withdrawal. The POSIT's substance use/abuse subscale has not been validated against the DSM-5. Although the literature on the concordance between DSM-IV and DSM-5 substance use diagnoses has been mixed, studies of adult and adolescent samples have generally shown greater prevalence of SUD diagnoses with DSM-5.³³⁻³⁷ These findings highlight the need to evaluate the validity of substance use screening measures relative to DSM-5 SUD diagnoses.

The present report examines the concurrent validity of the POSIT's original 17-item substance use/abuse subscale¹⁶ and a revised, shorter 11-item subscale²² in a sample of adolescents seeking primary care treatment at three FQHC sites in Baltimore using DSM-5 diagnoses for alcohol use disorder (AUD), cannabis use disorder (CUD), or either disorder (AUD or CUD or both). Study findings will provide novel data on the potential usefulness of these two versions of the POSIT's subscale to screen patients for risky substance use in adolescent medicine practices in order to determine the need for further screening and discussion with the provider. Although the POSIT has more items than some brief screening tools,^{17,38,39} its additional items may provide more detailed information to guide patient assessment and thereby inform the clinical discussion.

METHODS

Participants

Study participants were 525 adolescent primary care patients enrolled in a study evaluating the validity of a substance use screening instrument (the Brief Screener for Tobacco, Alcohol, and other Drugs) for adolescent primary care³⁸ using a variety of established measures, including the Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST),⁴⁰ CRAFFT,¹⁷ a modified World Mental Health-Composite International Diagnostic Interview (WMH-CIDI),⁴¹ and the POSIT.¹⁶ Participants were awaiting primary care appointments (e.g., routine health assessments for school, immunizations, or minor ailments) from June 2012 through February 2013 at any one of three sites of a FQHC that serves low-income, predominantly African-American residents. Inclusion criteria were: 1) 12-17 years of age; and 2) willingness to provide informed assent. The study was approved by our organization's Institutional Review Board (IRB) with waivers of written assent and parental consent.

Procedure

A research assistant (RA) was available to enroll participants at one of the three sites 4-5 days a week. The site was determined by the number of providers present on a particular day to maximize the number of adolescents approached.

Adolescents in the appropriate age range (identified by medical staff at the clinics) were approached by the RA in the clinic waiting area (either before or after their scheduled appointment) and invited to participate in an anonymous health survey development study.

The RA described the study in a private room to adolescents (and parents, if present) using an IRB-approved information sheet. Upon obtaining adolescents' verbal assent, parents returned to the waiting area and the RA administered study measures. Participants were given a \$20 gift card for a sandwich shop upon completing the assessments.

Measures

All participants completed the following measures:

Problem Oriented Screening Instrument for Teenagers (POSIT) Substance Use/Abuse Subscale¹⁶—The POSIT is a 139-item measure (yes/no scoring) used to screen for potential problems in ten functional areas (no time period specified): 1) Substance use/abuse; 2) Physical health; 3) Mental health; 4) Family relations; 5) Peer relations; 6) Educational status; 7) Vocational status; 8) Social skills; 9) Leisure/recreation; and 10) Aggressive behavior. In the current study, participants completed the 17 items in the POSIT's substance use/abuse subscale. Each item asks about both drugs and alcohol (e.g., "Do you get into trouble because you use drugs or alcohol at school?"). Original scoring as developed for the Adolescent Assessment Referral System (AARS) manual¹⁶ specifies that all items in this subscale are considered "red flag" items, so a "yes" response to any one item indicates the need for further assessment. Studies of this subscale using the recommended cutoff of 1 have found it to be generally reliable (Cronbach's alpha [α] ranges: 0.77-0.94) and valid (sensitivity ranges: 0.77-1.00; specificity ranges: 0.41-0.73).^{20-22,25-27,31} Other studies have suggested that 2 may be an ideal cut score in identifying problem use, with sensitivities ranging from 0.88 to 1.00 and specificities 0.79 to 0.82.^{22,31} Cut scores of 1 and 2 "yes" responses were examined in this study.

A revised POSIT substance use/abuse subscale consisting of 11 items from the 17-item subscale was developed by Latimer and colleagues²² using principal component analysis and validated using the DSM-III-R with 342 of the 348 adolescents from the AARS development study (sensitivity=0.91, specificity=0.82). The revised subscale was also examined in the current study.

Modified World Mental Health-Composite International Diagnostic Interview (WMH-CIDI)^{41,42}—A modified WMH-CIDI that included only the items for alcohol and cannabis that determine DSM-5 SUD diagnoses in the past 12 months (including an item on craving) was used as the criterion measure. The WMH-CIDI was designed for use with adults and adolescents 16 and older, but has been found to be valid and reliable using DSM-IV diagnoses with both adults⁴³ and adolescents as young as 13.^{44,45} Consistent with DSM-5 diagnostic thresholds, participants were classified as having a SUD if they endorsed two or more of eleven criteria for a given substance.³²

Statistical Analysis—Analysis focused on alcohol and cannabis use only, as other substance use was rare in this sample (<2% for all other substances). Reliability analysis was conducted to obtain estimates of internal consistency reliability and corrected item-total correlations for the standard and revised POSIT substance use/abuse subscales. Pearson correlation values between the standard and revised subscales were obtained to estimate the

correlation of the short form with the long form. Receiver operating characteristic (ROC) area under the curve (AUC) values, sensitivities (true positives), and specificities (true negatives) were obtained to examine POSIT cut points of 1 and 2 “yes” responses against DSM-5 diagnoses for: 1) alcohol use disorder (AUD); 2) cannabis use disorder (CUD); and 3) either (or both) of the SUDs (AUD or CUD) for both the 17-item and 11-item subscales.

RESULTS

Participants

Of 584 adolescents screened for the primary study, 54 refused, and 5 were excluded due to missing data, leaving a study sample of 525 adolescents. Participants were 55% female, and 93% were African American (see Table 1). Fifty-one percent of the adolescents were 12-14 years old and 49% were 15-17 years old; 60% were in high school.

Of the 525 adolescents, 124 (23.6%) reported using alcohol and 110 (21.0%) reported using cannabis in the past year on the modified WMH-CIDI. Additionally, 24 (4.6%) and 56 (10.7%) participants met criteria for AUD and for CUD, respectively, and 65 (12.4%) met criteria for either AUD ($n=9$) or CUD ($n=41$) or both SUDs ($n=15$). Regarding POSIT risk levels, 119 and 113 participants met the cutoff of 1 for the standard and revised subscales, respectively. Additionally, 77 and 73 participants met the cutoff of 2 for the standard and revised subscales, respectively. Table 2 shows the breakdown of the number of participants who met criteria for the DSM-5 SUD diagnoses and POSIT risk by gender and age group.

POSIT Psychometric Properties

The correlation between the standard (17-item) POSIT substance use/abuse subscale and the revised (11-item) subscale was 0.99. Reliability analysis showed acceptable internal consistency for both subscales (Cronbach's $\alpha=0.86$ and 0.85 for standard and revised, respectively).

POSIT items for the standard and revised subscales are listed in Table 3 with the number and percent of participants endorsing each item. Corrected item-total correlations are also found in Table 3. A correlation value of 0.30 is often considered an acceptable cutoff for an item's inclusion in a scale.^{46,47} For the standard subscale, 14 of the 17 items have coefficients above 0.30. When the three items with coefficients below 0.30 are deleted from the subscale, internal consistency α remains at 0.86. All 11 items in the revised subscale developed by Latimer and colleagues²² have item-total correlation values above 0.30.

Concurrent Validity of the Standard POSIT Substance Use/Abuse Subscale (17 items)

Values for AUC, sensitivity, and specificity for the standard and revised subscales for AUD, CUD, and either (or both) SUD with cutoffs of 1 and 2 are shown in Table 4. AUC values for the standard subscale using a cutoff of 1 were greater than 0.90 for all the disorders and were superior to AUC values when using a cutoff of 2 (range: 0.84-0.91). Sensitivities were 1.00 for all the disorders when using a cutoff of 1 and were higher than sensitivities when using a cutoff of 2, which ranged from 0.79-0.86. Specificities were higher when using a cutoff of 2 (range: 0.88-0.95) than a cutoff of 1 (range: 0.81-0.88).

Concurrent Validity of the Revised POSIT Substance Use/Abuse Subscale (11 items)

As with the standard (17-item) subscale, AUCs for all the disorders were higher for the revised (11-item) subscale when using a cutoff of 1 vs. 2 (see Table 4). Similarly, a cutoff of 1 yielded higher sensitivities than a cutoff of 2 for the 11-item subscale (ranges for 1 and 2: 0.96-1.00 and 0.79-0.86, respectively), and specificities were higher when using a cutoff of 2 (ranges for 1 and 2: 0.82-0.89 and 0.89-0.96, respectively).

DISCUSSION

This study examined the validity of the POSIT's standard 17-item substance use/abuse subscale and a briefer, revised 11-item version of this subscale against DSM-5 SUD criteria using cutoffs of 1 and 2 "yes" responses. Our findings suggest that both versions of the POSIT's substance use/abuse subscale may be useful for screening adolescents for potential substance use problems. In terms of reliability, both the standard 17-item substance use/abuse subscale and the revised 11-item version yielded acceptable values for Cronbach's alpha. Additionally, corrected item-total correlations showed that 14 of 17 items in the standard subscale and all 11 items in the revised subscale have correlation coefficient values above the generally accepted cutoff of 0.30. Our finding that three items from the standard subscale that were not included in the revised subscale developed by Latimer and colleagues had correlations greater than 0.30 may suggest that the POSIT's standard substance use/abuse subscale could be modified to 14 items. However, it is not unusual that the psychometric characteristics of a scale fail to meet measurement 'standards' in a given sample⁴⁸ due to such factors as unusually large random variation, sample fluctuation, and behavioral differences across samples (e.g., floor and/or ceiling effects). In this study, two of the items from the standard scale with corrected item-total correlations below 0.30 relate to driving and may not be applicable to the majority of adolescents in this sample. These items may be more useful for older adolescents or for adolescents living in suburban or rural locations where more teens drive.

Both the standard 17-item subscale and the revised 11-item subscale yielded generally high values for AUC, sensitivity, and specificity at both cutoffs. Using the recommended cutoff of 1, the standard POSIT subscale identified all adolescents with AUD, CUD, and adolescents with a diagnosis of either (or both) of these disorders. The revised subscale identified all 56 adolescents with CUD, 23 of 24 adolescents with AUD, and 64 of 65 adolescents who met criteria for either or both disorders. Latimer et al.²² reported similar findings on the comparability of the standard POSIT substance use/abuse subscale and the revised subscale, as did Danseco and Marques²⁴ in their development and validation study of an 11-item subscale nearly identical to the revised subscale developed by Latimer and colleagues. Given that the revised substance use/abuse subscale has six fewer questions than the standard version, the former may be preferable for use as a screener in busy pediatric practices.

We found that concurrent validity was generally high when using a cutoff of either 1 or 2 "yes" responses. In the current study, a cutoff of 1 yielded higher sensitivities, and a cutoff of 2 yielded higher specificities. Since adolescents are a high-risk group for substance-related health consequences⁴⁹ and substance use in adolescence may progress into SUDS in adulthood,^{8,9} it is important to identify as many adolescents as possible who may have

substance use problems. Hence, a cut off 1 would seem appropriate for use in a healthcare setting. Providers should meet with all adolescents who screen positive for risky substance use for a discussion and further assessment and to make recommendations or referrals to treatment as needed. For adolescents who are not using any substances, providers should give positive reinforcement for abstinence,⁵⁰ which has been shown to delay the initiation of alcohol use in adolescents.⁵¹

To our knowledge, this is the first study that evaluated the POSIT's substance use/abuse subscale using the DSM-5. Previous studies of the validity of the POSIT have used the DSM-IV or the DSM-III-R as the criterion measure.^{20,22,24,29-31} In light of the recent revisions to the DSM and SUD diagnoses, studies evaluating the validity of the POSIT and other substance use screeners with the DSM-5 are warranted. As part of the parent study, we previously reported on the concordance between DSM-IV and DSM-5 with the same sample of 525 participants in the present report. We found that diagnoses were more prevalent for alcohol and cannabis using DSM-5 criteria (4.6% vs. 3.8% for alcohol, 10.7% vs. 9.0% for cannabis).³⁷ All of the new cases that met DSM-5 (but not DSM-IV) criteria for AUD were due to the lower threshold in DSM-5. In contrast, only 36% of the new diagnoses for CUD were due to the lower threshold alone, and the other 64% gained their diagnosis due to the lower threshold along with either the new craving item, the new cannabis withdrawal item, or both items. Additionally, the elimination of the legal item in DSM-5 resulted in 2 of 5 switches from having a diagnosis in DSM-IV to not having a diagnosis in DSM-5 for alcohol, and the only such switch for cannabis.

Only a few studies were found in the literature that report on the validity of other adolescent substance use screening tools using DSM-5 criteria.^{38,39,52,53} In prior reports by our group using DSM-5 SUD criteria as the standard with the same sample of 525 adolescents from the current study, we evaluated the validity of the CRAFFT and the ASSIST and ASSIST Lite⁵⁴ with the DSM-5 using data from our parent study.^{52,53} Findings from these analyses and the present study of the POSIT show comparable values across the four screening measures for AUC (range: 0.84-0.97), sensitivity (range: 0.79-1.00), and specificity (range: 0.79-0.96). A provider's choice of screener may depend on the population served by the clinic, as well as time and staffing constraints. The POSIT and ASSIST take more time to administer than the CRAFFT. However, they have the advantage of providing richer information to guide subsequent interview probes, enhance clinical discussion with the adolescent, and inform a possible intervention. Moreover, the POSIT, CRAFFT, and ASSIST all have self-administered computer versions that have been validated,⁵⁵⁻⁵⁷ which may make their administration easier and more appealing to both adolescents and providers. Future research could directly compare the performance of these screeners in various populations and clinical settings. Given the recent interest in single question frequency screens,^{58,59} future studies should also examine the performance of the POSIT and other validated screening assessments against these single-item screens with adolescents.

Rates of AUD (4.6%) and CUD (10.7%) found in the current study were considerably higher than national rates among 12-17 year olds (2.7% for alcohol and 2.7% for cannabis abuse or dependence using DSM-IV criteria),¹ emphasizing the need for routine screening in FQHCs. The POSIT subscales proved to be highly sensitive and specific for identifying adolescents

with SUDs among the participants in this study. Adolescent medicine providers in busy FQHCs could use the computerized version of the POSIT to reduce time and staffing burdens associated with screening.

This study had several limitations. First, the study sample was primarily composed of African-American adolescents, and, therefore, findings may not be generalizable to other populations. Second, the rates of DSM-5 AUD and CUD were relatively low in this sample, limiting our ability to further evaluate optimal cut points by gender or age group. Such analysis should be a focus of future research. A third limitation lies in the design of the POSIT, which—like the CRAFFT—does not distinguish between alcohol and other substance use. Thus, further assessment by the practitioner to distinguish between the types of substances used, their frequency of use, and the severity of associated problems is necessary. Additionally, the WMH-CIDI has not been validated with adolescents younger than 13, and only the WMH-CIDI items that map to DSM-5 SUD diagnoses were administered (not the full assessment), which may affect its validity and reliability. Finally, this study was a secondary analysis and not designed to compare the two versions of the POSIT substance use/abuse subscale.

Conclusion

Findings suggest that the POSIT's substance use/abuse subscale may be a useful tool for screening adolescents for risky alcohol and cannabis use using a cutoff of 1 or 2. Providers concerned with minimizing false negatives may prefer to use a cutoff of 1 to increase the likelihood that they identify as many adolescents as possible who may be considered at risk. The briefer, revised 11-item POSIT substance use/abuse subscale appears to have comparable sensitivity and specificity to the standard version, and may, therefore, be preferable for use in busy health care settings.

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TABLE 1.Participant Characteristics ($N = 525$)

	<i>n</i> (%)
Gender	
Male	239 (45.5%)
Female	286 (54.5%)
Race	
Black/African American	487 (92.8%)
White	4 (0.8%)
Other	34 (6.5%)
Age group	
12–14 years old	267 (50.9%)
15–17 years old	258 (49.1%)
School enrollment status ($n=524$) [*]	
Middle school	196 (37.3%)
High school	315 (60.0%)
Not enrolled in school/other	13 (2.5%)

^{*} Datum was missing for one participant.

TABLE 2.

Number (%) of Participants Who Met Criteria for DSM-5 SUD Diagnoses and POSIT Substance Use/Abuse Risk by Gender and Age Group

	Total (N = 525)	Gender		Age group	
		Male (n = 239)	Female (n = 286)	12–14 (n = 267)	15–17 (n = 258)
DSM-5 diagnoses					
Alcohol Use Disorder (AUD)	24 (4.6%)	12 (5.0%)	12 (4.2%)	4 (1.5%)	20 (7.8%)
Cannabis Use Disorder (CUD)	56 (10.7%)	35 (14.6%)	21 (7.3%)	3 (1.1%)	53 (20.5%)
Either/both AUD or CUD	65 (12.4%)*	37 (15.5%)	28 (9.8%)	6 (2.2%)	59 (22.9%)
POSIT standard subscale					
Risk cutoff of 1	119 (22.7%)	63 (26.4%)	56 (19.6%)	20 (7.5%)	99 (38.4%)
Risk cutoff of 2	77 (14.7%)	43 (18.0%)	34 (11.9%)	12 (4.5%)	65 (25.2%)
POSIT revised subscale					
Risk cutoff of 1	113 (21.5%)	60 (25.1%)	53 (18.5%)	20 (7.5%)	93 (36.0%)
Risk cutoff of 2	73 (13.9%)	42 (17.6%)	31 (10.8%)	12 (4.5%)	61 (23.6%)

* Of the 65 participants, 9 met criteria for AUD only, 41 met criteria for CUD only, and 15 met criteria for both SUDs.

TABLE 3.
 POSIT Substance Use/Abuse Item Endorsement (*n*, %) and Corrected Item-Total Correlations for 525 Participants

	<i>n</i> (%)	Corrected item-total correlations	
		Standard subscale	Revised subscale
Do you get into trouble because you use drugs or alcohol at school?	10 (1.9%)	0.45	-
Have you accidentally hurt yourself or someone else while high on alcohol or drugs?	15 (2.9%)	0.43	0.42
Do you miss out on activities because you spend too much money on drugs or alcohol?	17 (3.2%)	0.64	0.62
Do you ever feel you are addicted to alcohol or drugs?	27 (5.1%)	0.64	0.63
Have you started using more and more drugs or alcohol to get the effect you want?	16 (3.0%)	0.55	0.56
Do you ever leave a party because there is no alcohol or drugs?	6 (1.1%)	0.21	-
Do you have a constant desire for alcohol or drugs?	19 (3.6%)	0.56	0.58
Have you had a car accident while high on alcohol or drugs?	3 (0.6%)	0.28	-
Do you forget things you did while drinking or using drugs?	36 (6.9%)	0.52	0.51
During the past month have you driven a car while you were drunk or high?	8 (1.5%)	0.30	-
Does alcohol or drug use cause your moods to change quickly like from happy to sad or vice versa?	55 (10.5%)	0.64	0.64
Do you miss school or arrive late for school because of your alcohol or drug use?	22 (4.2%)	0.49	-
Do your family or friends ever tell you that you should cut down on your drinking or drug use?	57 (10.9%)	0.50	0.50
Do you have serious arguments with friends or family members because of your drinking or drug use?	18 (3.4%)	0.59	0.55
Does your alcohol or drug use ever make you do something you would not normally do like breaking rules, missing curfew, or breaking the law?	51 (9.7%)	0.53	0.54
Do you have trouble getting along with any of your friends because of your alcohol or drug use?	5 (1.0%)	0.25	-
Do you ever feel you can't control your alcohol or drug use?	22 (4.2%)	0.56	0.55

TABLE 4.

Sensitivity, Specificity, and Receiver Operating Characteristic Area Under the Curve (AUC) with 95% Confidence Intervals for POSIT Standard Substance Use/Abuse Subscale and Revised Subscale with DSM-5 Substance Use Disorders ($N = 525$)

	Standard POSIT substance use/abuse subscale (17 items)			Revised POSIT substance use/abuse subscale (11 items)		
	Sensitivity	Specificity	AUC	Sensitivity	Specificity	AUC
<i>POSIT cutoff of 1</i>						
Alcohol Use Disorder (AUD)	1.00 (*)	0.81 (0.78–0.84)	0.91 (0.88–0.94)	0.96 (0.83–1.00)	0.82 (0.79–0.85)	0.89 (0.84–0.94)
Cannabis Use Disorder (CUD)	1.00 (*)	0.87 (0.83–0.90)	0.93 (0.91–0.95)	1.00 (*)	0.88 (0.85–0.91)	0.94 (0.92–0.96)
Either/both AUD or CUD	1.00 (*)	0.88 (0.85–0.91)	0.94 (0.92–0.96)	0.99 (0.93–1.00)	0.89 (0.86–0.92)	0.94 (0.91–0.96)
<i>POSIT cutoff of 2</i>						
Alcohol Use Disorder (AUD)	0.79 (0.60–0.92)	0.88 (0.85–0.91)	0.84 (0.74–0.93)	0.79 (0.60–0.92)	0.89 (0.86–0.92)	0.84 (0.75–0.94)
Cannabis Use Disorder (CUD)	0.86 (0.77–0.94)	0.94 (0.92–0.96)	0.91 (0.86–0.96)	0.86 (0.75–0.93)	0.95 (0.92–0.97)	0.90 (0.85–0.96)
Either/both AUD or CUD	0.85 (0.75–0.92)	0.95 (0.93–0.97)	0.90 (0.85–0.95)	0.83 (0.73–0.91)	0.96 (0.94–0.97)	0.90 (0.84–0.95)

* 95% confidence interval cannot be calculated due to the fact that sensitivity equals 1.