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SHORT COMMUNICATION

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The adolescent domain screening inventory as a screen for assessing opiate use

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ABSTRACT

The United States has seen steady increases in opiate and opioid use over the last few years. Barriers to treatment include the lack of early identification of substance use disorders. A review of the literature revealed no instruments specifically tested to identify opiate users for early intervention. One instrument that may serve this purpose is the adolescent domain screening inventory, or ADSI.

Methods: This exploratory study is a secondary analysis; the study employed the use of an independent *t*-test and logistic regression through IBM SPSS 24 software.

Results: The independent *t*-test showed a statistically significant difference between the ADSI scores for non-opiate users and opiate users ($p < 0.001$). The ADSI showed a 20% increase over the beginning block, and predicted 72.8% of opiate users in this sample.

Conclusion: This study suggests that the ADSI may be a useful tool in identifying the opiate users who are early in their use, in an effort to provide substance use intervention and treatment in a timely manner.

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The United States has seen steady increases in opiate and opioid use over the last few years. Opiates, such as heroin, are part of the larger opioid category. National Institute of Drug Abuse (NIDA) reports that the incidence of heroin use has been rising steadily since 2007, suggesting that this increase is related to the larger surge in opioid usage, as heroin is often a cheaper and easier to obtain substitute for other opioids [1]. The U. S. Department of Health and Human Services presents the following statistics: overdose deaths from opioids has quadrupled since 1999, more than half a million people have died in the U. S. between the years 2000 and 2015, and that 91 people a day die from drug overdoses in the U.S [2]. The World Health Organization estimates 15 million opioid dependent individuals worldwide, and yet only 10% of those requiring treatment are receiving the medical help they need [3]. There is a little disagreement that this problem must be addressed.

Barriers to treatment have been well studied and include the following factors: individual client factors, treatment accessibility, treatment availability, and client acceptability [4–7].

One such barrier, the lack of early identification of substance use disorders is at the center of the SAMHSA screening, brief intervention, and referral to treatment (SBIRT) initiative [8,9]. SBIRT is an evidence-based model for the assessment and treatment of substance use disorders [10]. The importance of early identification of the substance use disorders are well documented [11–13]. Some benefits noted by these researchers include decreasing the burden of future disease [11,13], improving treatment outcomes [10], and decreasing the likelihood of serious consequences [12].

While there are several high quality screens available that can be used to identify substance use and abuse in general, a review of the literature revealed no instruments specifically tested to identify opiate users for the early intervention. Given the current state of opioid crisis, such an instrument could prove helpful in stemming the tide of overdose deaths, reducing the personal and societal costs associated with opioid misuse, and direct those in need into treatment.

One instrument that may serve this purpose is the Adolescent Domain Screening Inventory,

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or ADSI. The ADSI is a reliable and valid, evidence-based, individualized risk and protective factor assessment instrument [14]. The ADSI adequately identifies those adolescents at risk of alcohol, marijuana, and tobacco use, correctly predicting high-risk status at 93% of the time, and predicts problematic use of those substances at 84.3% of the time. The ADSI has also shown acceptable psychometric properties when the development was replicated with an 18- to 20-year old population, predicting high risk for use of alcohol, marijuana, and tobacco 86.7% and problematic use 80.7% of the time [15].

The ADSI derives from the work of Hawkins et al. [16], and is an adapted short form of their Communities That Care Youth Survey [17]. Using a public health model, Hawkins et al. [16] identified all empirically validated risk and protective factors that were shown to be predictive of adolescent substance use. The Communities That Care Youth Survey was developed to measure the presence or absence of these factors in the community, and the ADSI sought to bring this thinking into an individual assessment protocol [18]. The ADSI was further tested and found to show good predictive validity in identifying adolescents engaged in substance use and at risk for use [14,15].

The purpose of the exploratory study is to determine the potential use of the ADSI to identify opiate use in adolescents.

The following research questions were examined: (1) Does the ADSI sufficiently distinguish between non-substance users and opiate users and (2) Does the ADSI show sufficient predictive validity to warrant further testing and consideration for use as a screening instrument to identify and predict opiate use in adolescents.

Methods

This exploratory study is a secondary analysis of data collected by the New York State Office of Alcohol and Substance Abuse Services in 2000, used to develop the ADSI. The study employed the use of an independent *t*-test and logistic regression through IBM SPSS 24 software.

Sample

The sample used for these analyses consisted of 26,781 surveys completed by students in grades 9 through 12 in the year 2000. These surveys were collected by prevention providers in 11 sites in New York State, and compiled by the New York State Office of Alcoholism and Substance Abuse Services' Prevention Bureau in the process of routine practice, over the course of 2 months. The respondents were mostly urban and suburban youths and were relatively evenly split on grade level and gender. In addition, the sample was primarily white [18]. Sites differed on collection method although all employed a passive parental consent process and students were given the chance to opt out of participating. Four sites surveyed all willing students in school on the day of data collection. The number of students not in school or not completing usable surveys was not collected. The remaining seven sites used a random cluster-sampling plan. Finally, the data provided for this study were consolidated and stripped of identifying information prior to analysis [19].

Adolescent domain screening inventory

The ADSI is an evidence-based, individualized risk, and protective factor assessment survey that consists of 33 items across four subscales: school, family, community, and individual/peer. Concurrent criterion validity correlations range from $r = 0.85$ to $r = 0.95$. Correlation for known instrument validity is $r = 0.56$ and convergent construct validity is $r = 0.49$. The ADSI demonstrated a general applicability across gender and race [19]. Test–Retest reliability is high with correlations ranging from 0.95 for the total scale to 0.80 for the community subscale. Internal consistency alphas were acceptable considering the nature of the domain subscales, ranging from 0.53 to 0.82 [20]. The ADSI correctly predicted high risk for alcohol, marijuana, and tobacco use at 93% of the time and problematic use of these substances at 84.3% [14]. The ADSI showed varied, but similar results in use with an 18- to 20-year old population as it did with the original 13–17 year old sample upon which it was developed [15].

As derived from the Communities That Care Youth Survey [17], the ADSI includes the items that were most predictive of substance use for each of the 33 risk and protective factors identified by Arthur et al. [17]. There are no direct use questions, but rather, items that indicate the presence or absence of the empirically identified risk and protective factors in the framework used by Arthur et al. [17]. Please see Table 1 for the ADSI items.

Analyses

A dichotomous variable for lifetime use of opiates was developed from the original dataset, which included two items asking about lifetime use of

Table 1. Adolescent domain screening inventory.

1.	If a kid smoked marijuana in your neighborhood would he or she be caught by the police?
2.	I like my neighborhood.
3.	There are people in neighborhood who are proud of me when I do something well.
4.	How much does the following statement describe your neighborhood: crime and/or drug selling?
5.	Are service clubs available in your community for people your age?
6.	How wrong would most adults in your neighborhood think it was for kids your age to use marijuana?
7.	If you wanted to get some marijuana, how easy would it be for you to get some?
8.	How many times have you changed homes since kindergarten?
9.	My parents ask me if I've gotten my homework done.
10.	People in my family often insult or yell at each other.
11.	If you drank some beer or wine or liquor (e.g., vodka, whiskey, or gin) without your parents' permission, would you be caught by your parents?
12.	My parents give me lots of chances to do fun things with them.
13.	How wrong do your parents feel it would be for you to smoke marijuana?
14.	About how many adults have you known personally, who in the past year have used marijuana, crack, cocaine, or other drugs?
15.	Have any of your brothers or sisters ever: Smoked marijuana?
16.	Have any of your brothers or sisters ever: Taken a handgun to school?
17.	How old were you when you first: Smoked marijuana?
18.	How old were you when you first: Attacked someone with the idea of seriously hurting them?
19.	How wrong do you think it is for someone your age to: Drink beer, wine or hard liquor (for example, vodka, whiskey, or gin) regularly?
20.	How wrong do you think it is for someone your age to: Smoke Marijuana?
21.	How wrong do you think it is for someone your age to: Use LSD, cocaine, amphetamines, or another illegal drug?
22.	How much do you think people risk harming themselves (physically or in other ways) if they smoke marijuana regularly?
23.	How often do you attend religious services or activities?
24.	Think about your four best friends (the friends you feel closest to). In the past year (12 months), how many of your best friends have sold illegal drugs?
25.	I do the opposite of what people tell me just to get them mad.
26.	What are the chances you would be seen as cool if you smoked marijuana?
27.	You're looking at CD's in a music store with a friend. You look up and see her slip a CD under her coat. She smiles and says "Which one do you want? Go ahead, take it while nobody's around." There is nobody in sight, no employees and no other customers. What would you do now?
28.	How many times have you done crazy things even if they are a little dangerous?
29.	My teacher praises me when I work hard in school.
30.	There are lots of chances for students in my school to get involved in sports, clubs, and other school activities outside of class.
31.	Now, thinking back over the past year in school, how often did you: Enjoy being in school?
32.	Now, thinking back over the past year in school, how often did you: Try to do your best work in school
33.	During the LAST FOUR WEEKS how many whole days have you missed because you skipped or "cut"?

heroin and lifetime use of other opiates (added together and dichotomized into use or no use to form the new variable) and used to determine the means for these two groups and if a statistically significant difference in score was shown to exist on the continuous ADSI score variable. These variables were used again in a logistic regression to determine the predictive validity of the ADSI for determining opiate use.

Results

There were no outliers and both groups were approximately normally distributed as shown in Figure 1. Levene's test for homogeneity of variances suggests that the variances are homogeneous. This independent *t*-test shows that there is a statistically significant difference between the ADSI scores for non-opiate users (p <0.001), with a mean of 34.8, and opiate users, whose mean score was 52.1 (see Table 2).

As shown in Table 3, the ADSI showed a 20% increase over the beginning block or null model, and predicted 72.8% of opiate users in this sample. This analysis shows the sensitivity and specificity to cluster around the percent correct, at 72.7% and 72.9%, respectively. The results show a false positive rate of 29%, and false negative rate

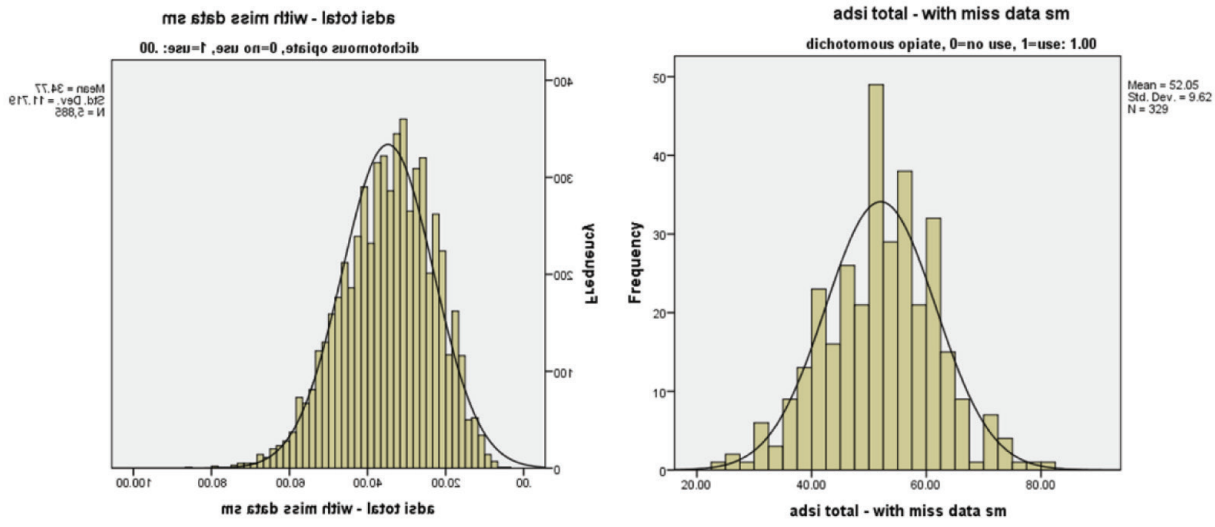

Figure 1. ADSI distributions – opiate use/no opiate use.

Table 2. *t*-Test for ADSI opiate use/no opiate use.

	Opiate use, 0 = no use, 1 = use	N	Mean	Std. deviation	Std. error mean
ADSI score	0.00	5885	34.8	11.7	0.15
	1.00	329	52.1	9.6	0.53

		Levene's Test for Equality of Variances		*t*-test for Equality of Means						
		F	Sig.	*t*	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% Confidence interval of the difference	
									Lower	Upper
ADSI total	Equal variances assumed	25.0	0.000	−26.2	6212	0.000	−17.3	0.66	−18.6	−15.9
	Equal variances not assumed			−31.3	384.5	0.000	−17.3	0.55	−18.4	−16.2

Table 3. Logistic regression – ADSI on opiate use.

Beginning Block		Opiate use – predicted		Percentage correct
		No	Yes	
Opiate use – observed	No	0	2965	0.00
	Yes	0	3238	100.0
Overall percentage				52.2

		Opiate use – predicted		Percentage correct
		No	Yes	
Opiate use – observed	No	2156	809	72.7
	Yes	878	2360	72.9
Overall percentage				72.8

False positive 878/3034 = 0.29, false negative 809/3169 = 0.26.

Table 4. Logistic regression significance tests – ADSI on opiate use.

		B	S.E.	Wald	df	Sig.	Exp (B)
Use	ADSI total	0.118	0.003	1302.078	1	0.000	1.126
	Opiate use	−4.065	0.117	1205.332	1	0.000	0.017

at 26%. Table 4 shows that the results were significant at the $p = 0.01$ level when examining the Wald chi-square significance test.

Conclusion

The ADSI shows a statistically significant difference in mean scores between opiate users and non-opiate users, with a 17-point difference in mean scores, thus showing an ability to distinguish between opiate users and non-opiate users.

Further, the predictive validity results are encouraging, correctly identify 72.8% of opiate users in this sample. The 20% improvement from the null model suggests the ADSI considerably improves prediction [21].

Together, these results suggest that the ADSI may be a useful tool in identifying opiate users who are early in their use, in an effort to provide substance use intervention and treatment in a timely manner. By identifying adolescents who are early users, or who are predicted to begin use, of opiates, provides a clinician with a window to begin intervention before more serious consequences begin to be experienced by individuals. SAMHSA [9] demonstrates the considerable advantage to intervening early in substance use disorders. The ADSI shows the potential for allowing this early intervention.

There are several limitations with this study that merit discussion. Because it was a secondary analysis, sampling for this study was proscribed. Therefore, the study was limited to a convenience sample, rather than a random selection of participants, and thus relied on using statistical controls to compare samples. This sampling frame was limited to primarily urban and suburban, white, New York State adolescents and the study's generalizability is questionable. Testing of this instrument in other regions of the country could address the generalizability concerns. Further testing on new populations should be conducted. However, because the purpose of the study was development of a measure, and not an experiment, a convenience sample of secondary data served the purpose of being a first test for this screen. Finally, the sample was large, calling into question the statistical significance of the relationships observed. Repeated use of this instrument is needed before confidence can be placed on those results.

While the results from this exploratory, secondary analysis are hopeful, the ADSI would need further testing before being used in the manner described.

References

[1] National Institute of Drug Abuse. Heroin: overview, 2018. Available via https://www.drugabuse.gov/publications/research-reports/heroin/overview (Accessed 8 November 2018).

[2] U. S. Department of Health and Human Services. The U.S. opioid epidemic: understanding the Epidemic, 2017. Available via https://www.cdc.gov/drugoverdose/epidemic/index.html (Accessed 6 August 2018).

[3] World Health Organization. Information sheet on opioid overdose, 2017. Available via http://www.who.int/substance_abuse/information-sheet/en/ (Accessed 6 August 2018).

[4] Appel PW, Oldak R. A preliminary comparison of major kinds of obstacles to enrolling in substance abuse treatment (AOD) reported by injecting street outreach clients and other stakeholders. Am J Drug Alcohol Abuse; 33(5):699–706.

[5] Grant BF. Barriers to alcoholism treatment: reasons for not seeking treatment in a general population sample. J Stud Alcohol 1997:58(4):365–71.

[6] Liebling EJ, Yedinak JL, Green TC, Hadland SE, Clark MA, Marshall BDL. Access to substance use treatment among young adults who use prescription opioids non-medically. Subst Abuse Treat Prev Policy ;11(38):1–12.

[7] Padwa H, Ni Y, Barth-Rogers Y, Arangua L, Andersen R, Gelberg L. Barriers to drug use behavior change among primary care patients in urban United States community health centers. Subst Use Misuse; 49:743–51.

[8]. Hodgson J, Atherton L, Stanton M, Toriello P, Borst C, Winter AM, et al. Implementation of SBIRT: focus group analysis of provider teams in academic and community healthcare settings. J Rehabil ;82(4):48–59.

[9] SAMHSA. White paper: screening, brief intervention and referral to treatment (SBIRT) in behavioral healthcare, Available via http://www.samhsa.gov/prevention/SBIRT/(Accessed 6 August 2018).

[10] Davoudi,M, Rawson RA. Screening, brief intervention, and referral to treatment (SBIRT) initiatives in California: notable trends, challenges, and recommendations. J Psychoact Drugs ; 6:239–48.

[11] Finnell D. Screening, brief intervention, and referral to treatment (SBIRT): moving from passive spread to widespread adoption. J Addictions Nursing; 24:195–8.

[12] O'Brien A, Leonard L, Deering D. Could an advance practice nurse improve detection of alcohol misuse in the emergency department? Int J Ment Health Nurs 2012; 21(4):340–48.

[13] Young M. M, Stevens A, Porath-Waller A, Pirie T, Garritty C, Skidmore B, et al. Effectiveness of brief interventions as part of the screening, brief intervention and referral to treatment (SBIRT) model for reducing the non-medical use of psychoactive

substances: a systematic review protocol. Systematic Reviews 2012; 1:1-22.
[14] Corrigan MJ. Predictive validity test of the adolescent domain screening inventory. J Child Adolesc Subst Abuse ;23(2):130–6.
[15] Corrigan MJ, Forte J, Bulgaris S. Validity test of the adolescent domain screening inventory for use in an older adolescent population. J Alcohol Drug Educ ; 61(3):72–85.
[16] Hawkins JD, Catalano R, Miller J. Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: implications for substance abuse prevention. Psychol Bull; 112(1):64–105.
[17] Arthur MW, Hawkins JD, Pollard JA, Catalano RF, Baglioni AJ. Measuring risk and protective factors for substance abuse, delinquency, and other adolescent problem behaviors: the communities that care youth survey. Eval Rev ;26(6):575–601.
[18] Corrigan MJ, Loneck B, Videka L. The development and preliminary validation of the ADSI: a substance abuse prevention tool. Res Soc Work Pract; 17(3), 348–57.
[19] Corrigan MJ. Item selection methods for the adolescent domain screening inventory. Res Soc Work Pract ;19(1):77–82.
[20] Corrigan M. J. & Gurdineer E.E. Reliability Analyses for the ADSI: Test-Retest and Internal Consistency. J Child Adolesc Subst Abuse 2012; 21(3):247–53.
[21] Peng CJ, Lee KL, Ingersoll GM. An introduction to logistic regression analysis and reporting. J Educ Res ; 96(1):3–14.