



Short communication

Crosswalk between DSM-IV dependence and DSM-5 substance use disorders for opioids, cannabis, cocaine and alcohol

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ABSTRACT

Background: Ascertaining agreement between DSM-IV and DSM-5 is important to determine the applicability of treatments for DSM-IV conditions to persons diagnosed according to the proposed DSM-5.

Methods: Data from a nationally representative sample of US adults were used to compare concordance of past-year DSM-IV opioid, cannabis, cocaine and alcohol dependence with past-year DSM-5 disorders at thresholds of 3+, 4+, 5+ and 6+ positive DSM-5 criteria among past-year users of opioids ($n = 264$), cannabis ($n = 1622$), cocaine ($n = 271$) and alcohol ($n = 23,013$). Substance-specific 2×2 tables yielded overall concordance (kappa), sensitivity, specificity, positive predictive values (PPV) and negative predictive values (NPV).

Results: For DSM-IV alcohol, cocaine and opioid dependence, optimal concordance occurred when 4+ DSM-5 criteria were endorsed, corresponding to the threshold for moderate DSM-5 alcohol, cocaine and opioid use disorders. Maximal concordance of DSM-IV cannabis dependence and DSM-5 cannabis use disorder occurred when 6+ criteria were endorsed, corresponding to the threshold for severe DSM-5 cannabis use disorder. At these optimal thresholds, sensitivity, specificity, PPV and NPV generally exceeded 85% (>75% for cannabis).

Conclusions: Overall, excellent correspondence of DSM-IV dependence with DSM-5 substance use disorders was documented in this general population sample of alcohol, cannabis, cocaine and opioid users. Applicability of treatments tested for DSM-IV dependence is supported by these results for those with a DSM-5 alcohol, cocaine or opioid use disorder of at least moderate severity or severe cannabis use disorder. Further research is needed to provide evidence for applicability of treatments for persons with milder substance use disorders.

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1. Introduction

The Diagnostic and Statistical Manual of Mental Disorders – 4th Edition (DSM-IV; American Psychiatric Association, 1994) conceptualized two discrete substance use disorders (SUD), abuse and dependence, defined by mutually exclusive sets of diagnostic criteria. Abuse required endorsement of one or more (1+) of four abuse criteria, and dependence required endorsement of three or more (3+) of seven dependence criteria. In contrast, the proposed Diagnostic and Statistical Manual of Mental Disorders – 5th Edition (DSM-5; <http://www.dsm5.org>) conceptualizes a unitary SUD construct, varying only in terms of severity. The 11 DSM-5 SUD criteria comprise a new craving criterion plus all the former DSM-IV abuse

and dependence criteria except substance-related recurrent legal problems. Mild DSM-5 SUD requires endorsement of 2–3 of these criteria, moderate SUD requires 4–5, and severe SUD requires 6+ criteria. A recent paper based on a general population sample of U.S. adults reported that 80.5% of individuals positive for DSM-IV alcohol dependence met criteria for DSM-5 moderate-to-severe alcohol use disorder (AUD); individuals with the two disorders showed no statistically significant differences in sociodemographic characteristics, health, psychiatric comorbidity, alcohol consumption or alcohol treatment utilization (Dawson et al., 2013). When AUDIT-C, a popular brief screener for AUD, was tested in the same sample, identical screening cutpoints optimized identification of DSM-IV alcohol dependence and DSM-5 moderate-to-severe AUD (Dawson et al., 2012).

Despite several studies comparing DSM-IV and DSM-5 AUD (see also Agrawal et al., 2011; Newton et al., 2011), we are unaware of any that examine the concordance of DSM-IV and DSM-5 specific drug use disorders. This information is critical for clinicians to

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Table 1
Concordance of past-year DSM-IV dependence with selected thresholds^a for DSM-5 past-year opioid, cannabis, cocaine and alcohol use disorders among past-year users of the specific substances: US adults 18 years of age and older.

DSM-5 SUD threshold	Kappa	% Concordant among individuals where DSM-IV dependence is:		% Concordant among individuals where DSM-5 SUD threshold is:	
		Positive (sensitivity)	Negative (specificity)	Positive (PPV)	Negative (NPV)
<i>Opioids</i>					
3+ positive criteria	0.856 (0.026)	100.0 (0.0)	97.1 (1.1)	77.1 (7.3)	100.0 (0.0)
4+ positive criteria	0.835 (0.029)	87.0 (7.6)	98.3 (0.9)	83.2 (7.1)	98.7 (0.8)
5+ positive criteria	0.727 (0.039)	64.5 (10.4)	99.2 (0.6)	88.9 (7.5)	96.6 (1.2)
6+ positive criteria	0.724 (0.040)	59.0 (10.7)	100.0 (0.0)	100.0 (0.0)	96.1 (1.2)
<i>Cannabis</i>					
3+ positive criteria	0.428 (0.016)	100.0 (0.0)	88.9 (1.0)	30.6 (3.5)	100.0 (0.0)
4+ positive criteria	0.614 (0.018)	99.3 (0.7)	94.5 (0.7)	47.0 (4.5)	100.0 (0.0)
5+ positive criteria	0.757 (0.017)	95.6 (2.1)	97.4 (0.5)	64.6 (5.5)	99.8 (0.1)
6+ positive criteria	0.781 (0.018)	78.6 (5.2)	99.0 (0.3)	79.7 (5.4)	98.9 (0.3)
<i>Cocaine</i>					
3+ positive criteria	0.734 (0.022)	100.0 (0.0)	85.8 (2.9)	67.5 (5.8)	100.0 (0.0)
4+ positive criteria	0.864 (0.018)	96.2 (3.7)	94.6 (1.8)	84.1 (4.7)	98.8 (1.2)
5+ positive criteria	0.852 (0.019)	86.7 (5.5)	97.3 (1.4)	90.4 (4.7)	96.1 (1.7)
6+ positive criteria	0.760 (0.025)	69.8 (6.9)	99.0 (0.7)	95.3 (3.3)	91.7 (2.3)
<i>Alcohol</i>					
3+ positive criteria	0.802 (0.003)	100.0 (0.0)	96.2 (0.2)	69.5 (1.1)	100.0 (0.0)
4+ positive criteria	0.830 (0.003)	82.6 (1.1)	98.8 (0.1)	86.0 (1.2)	98.5 (0.1)
5+ positive criteria	0.720 (0.005)	60.0 (1.4)	99.8 (0.1)	95.4 (1.2)	96.7 (0.2)
6+ positive criteria	0.568 (0.006)	41.8 (1.3)	100.0 (0.0)	99.6 (0.3)	95.3 (0.2)

^a Number of SUD criteria endorsed.

determine whether medications currently approved by the US Food and Drug Administration (FDA) for the treatment of DSM-IV alcohol dependence, e.g., acamprosate, naltrexone and disulfiram (Litten et al., 2012), and DSM-IV opioid dependence, e.g., methadone, buprenorphine, and naltrexone (Tetrault and Fiellin, 2012), may be appropriate for treating DSM-5 SUD. The same is true for drugs currently being tested for treatment of cocaine (Dackis et al., 2012; Haile et al., 2012; Karila et al., 2011; Kennedy et al., 2012; Winhusen et al., 2012) and marijuana disorders (Cooper et al., 2012; Mason et al., 2012; Van den Brink, 2012), if the selection criteria for those trials reflect DSM-IV dependence. Of particular interest is the specific number of positive DSM-5 criteria that maximizes concordance with DSM-IV dependence. Prior analyses have shown a good fit between alcohol dependence and 4+ positive DSM-5 criteria but have not investigated whether another threshold would improve concordance, nor have they examined concordance for illicit drugs. Accordingly, this paper uses data from a nationally representative sample of US adults to compare concordance of past-year DSM-IV opioid, cannabis, cocaine and alcohol dependence with past-year DSM-5 SUD thresholds of 3+, 4+, 5+ and 6+ positive criteria and investigate possible causes of variation across substances in optimal thresholds.

2. Methods

2.1. Sample

This analysis uses data from the National Longitudinal Alcohol Epidemiologic Survey (NLAES), conducted in 1991–1992 by the National Institute on Alcohol Abuse and Alcoholism. The NLAES sample comprised adults 18 and older living in households ($n=42,862$, response rate = 89%). Data were obtained in personal interviews from respondents who consented to participate after being informed about the survey content and confidential nature of the data. The NLAES is the most recent US survey to operationalize the DSM-IV criteria for SUD and include questions on craving for all substances. The more recent National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) included questions on alcohol craving in its second wave, but did not ascertain craving for illicit drugs (Compton et al., 2007; Hasin et al., 2007). This analysis was restricted to past-year users of opioids ($n=264$), cannabis ($n=1622$), cocaine ($n=271$) and alcohol ($n=23,013$).

2.2. Measures

Past-year DSM-IV substance dependence was coded positive for individuals who endorsed 3+ of the seven DSM-IV dependence criteria: tolerance, withdrawal (not counted toward cannabis dependence), recurrent use in larger quantities or

for longer than intended, persistent desire/attempt to stop or cut down on use, excessive time spent obtaining, using or recovering from use, continued use despite knowledge of substance-related physical/psychological problems, and important activities given up in favor of use. Past-year DSM-5 SUDs were based on 11 criteria: the seven dependence criteria described above, plus substance-related neglect of work, home or school responsibilities, recurrent use in hazardous situations, continued use despite substance-related interpersonal problems, and craving ("have a very strong desire or urge to drink/use [drug]").

Symptoms of alcohol and drug use disorders were queried separately. Lifetime alcohol users were first asked whether a symptom had ever occurred, then whether and how often it had occurred in the past year. Lifetime drug users were first asked whether a given symptom had ever occurred, then the drugs and drug-specific frequencies with which it had occurred in the past year. Withdrawal required 2+ withdrawal symptoms or substance use to prevent/alleviate withdrawal symptoms. Most other criteria required 1+ positive past-year symptoms; however, those specifying persistent or recurrent occurrence required multiple symptoms or repeated occurrence of a single symptom. Test-retest reliability of the DSM-IV NLAES SUD diagnoses was good to excellent, with kappas of 0.79 for any drug, 0.78 for cannabis, 0.91 for cocaine and 0.76 for alcohol (Grant et al., 1995).

2.3. Analysis

Substance-specific 2×2 tables were used to ascertain the concordance of past-year DSM-IV substance dependence with thresholds of 3+, 4+, 5+ and 6+ DSM-5 SUD criteria using kappa statistics (SAS Institute, 2008), a measure of chance-corrected agreement whose value generally varies from 0.000 (agreement no better than by chance) to 1.000 (perfect concordance). SUDAAN software (Research Triangle Institute, 2008), which adjusts for complex sample design characteristics, was used to determine the percentages of individuals positive and negative for DSM-IV dependence who were concordantly diagnosed at the various DSM-5 thresholds and the percentages of individuals positive and negative for the various DSM-5 thresholds who were concordantly diagnosed for DSM-IV dependence. The latter four measures are analogous to sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) in classic screening study design and are applied to the results of this study for the sake of brevity. Use of the DSM-IV diagnoses as the "gold standard" against which DSM-5 thresholds are evaluated does not imply greater validity of the DSM-IV classifications; rather, it reflects testing the new revision against the status quo.

3. Results

Overall concordance of DSM-IV opioid dependence and DSM-5 opioid use disorder was highest at a DSM-5 threshold of 3+ criteria ($\text{kappa}=.856$), declining slightly at 4+ criteria ($\text{kappa}=.835$) and dropping sharply ($\text{kappa}=0.727$ and 0.724) at 5+ and 6+ positive criteria (Table 1). A threshold of 3+ criteria necessarily resulted in a sensitivity of 100% (because 3+ dependence criteria were required

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