



# Psychometric properties of the Drug Use Disorders Identification Test (DUDIT) with substance abusers in outpatient and residential treatment<sup>☆</sup>

Andrew C. Voluse<sup>\*</sup>, Christopher J. Gioia, Linda Carter Sobell, Mariam Dum, Mark B. Sobell, Edward R. Simco

Nova Southeastern University, Center for Psychological Studies, 3301 College Ave., Ft. Lauderdale, FL 33314, USA

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## ABSTRACT

The psychometric properties of the Drug Use Disorders Identification Test (DUDIT), an 11-item self-report questionnaire developed to screen individuals for drug problems, are evaluated. The measure, developed in Sweden and evaluated there with individuals with severe drug problems, has not been evaluated with less severe substance abusers or with clinical populations in the United States. Participants included 35 drug abusers in an outpatient substance abuse treatment program, 79 drug abusers in a residential substance abuse treatment program, and 39 alcohol abusers from both treatment settings who did not report a drug abuse problem. The DUDIT was found to be a psychometrically sound drug abuse screening measure with high convergent validity ( $r = .85$ ) when compared with the Drug Abuse Screening Test (DAST-10), and to have a Cronbach's alpha of .94. In addition, a single component accounted for 64.91% of total variance, and the DUDIT had sensitivity and specificity scores of .90 and .85, respectively, when using the optimal cut-off score of 8. Additionally, the DUDIT showed good discriminant validity as it significantly differentiated drug from alcohol abusers. These findings support the DUDIT as a reliable and valid drug abuse screening instrument that measures a unidimensional construct. Further research is warranted with additional clinical populations.

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## 1. Introduction

Several brief drug abuse screening instruments have been developed to assess the severity of substance abusers' drug use (reviewed in Carey, 2002; Sobell, Toneato, & Sobell, 1994). One of these instruments, the Drug Use Disorders Identification Test (DUDIT; Berman, Bergman, Palmstierna, & Schlyter, 2005b), was recently developed in Sweden. Like the Drug Abuse Screening Test (DAST-10; Skinner, 1982), the DUDIT assesses an individual's illicit drug use and related consequences over the past year. In line with the Institute of Medicine's (1990) recommendations concerning relevant domains for substance abuse assessment tools, the DUDIT collects data in the following areas: (a) frequency of drug use, (b) drug-related problems, and (c) drug dependence symptoms.

The 11-item DUDIT was the result of an extensive literature review and think-aloud testing of three preliminary versions of the measure (Berman et al., 2005b). Developed as an analogous instrument to the Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993), the questions on the DUDIT parallel those on the AUDIT with very few exceptions (i.e., two items on the AUDIT were deleted and three new items were added). Nine questions are scored on 5-point scales ranging from 0 to 4, and two

are scored on 3-point scales with values of 0, 2, and 4. Thus, total scores range from 0 to 44, with higher scores suggestive of a more severe drug problem.

In their initial investigation of the psychometric properties of the DUDIT, Berman et al. (2005b) used both general and clinical population samples. Thus, the DUDIT was developed to identify individuals in the general public who may have a drug problem as well as individuals in clinical settings who are likely to meet criteria for a substance dependence diagnosis. As a comparison measure, Berman et al. (2005b) used the "Swedish translation of Chapter 12 of the Schedules for Clinical Assessment in Neuropsychiatry, Version 2.1" (p. 23) which is based on the *Diagnostic and Statistical Manual of Mental Disorders (4th ed) Text Revision* (DSM-IV-TR; American Psychiatric Association, 2000). For the general population sample, the DUDIT was administered to 1109 randomly selected individuals from the Swedish Population Registry. Using this sample, a Cronbach's alpha of .93 was found and it was reported that the T-scores at 1, 2, and 3 standard deviations (SD) from the mean (i.e.,  $T = 60, 70,$  and  $80$ , respectively) occurred at DUDIT scores of 3, 6, and 8 for men and 1, 2, and 3 for women, respectively. Based on these data, the authors recommend that scores of 6 for males and 2 for females be used as cut-off values suggestive of drug-related problems in the general population (Berman, Bergman, Palmstierna, & Schlyter, 2005a). The clinical population consisted of 160 individuals who were either inpatients at an addiction detoxification unit, prison detainees, prison inmates, or probation clients. In this sample, the DUDIT yielded a Cronbach's alpha of .80. In addition, a cutoff score of 25 yielded a

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<sup>\*</sup> Corresponding author. Tel.: +1 954 262 5818.

E-mail address: voluse@nova.edu (A.C. Voluse).

sensitivity of 90% and a specificity of 78% and the area under the curve (AUC) was .94 for drug dependence diagnoses. Consequently, the authors suggested that scores greater than 25 be used as the cut-off for identifying individuals in clinical populations who are likely to meet substance dependence criteria (Berman et al., 2005a, 2005b).

Subsequent articles have reported mean (*SD*) DUDIT scores in substance abusing samples ranging from 16.9 (9.8) for dependent substance abusers who had relapsed (Landheim, Bakken, & Vaglum, 2006) to 31.9 (6.1) for inpatient opiate abusers (Berman, Källmén, Barredal, & Lindqvist, 2008). The latter study also found that 88% of this known substance abusing sample scored greater than 25 points on the DUDIT (the recommended cut-off score for probable substance dependence), suggesting that the measure was useful in detecting substance dependence in this population.

Berman, Palmstierna, Kallmen, and Bergman (2007) also developed the DUDIT-Extended, a 54-item instrument that contains additional questions about drug-related consequences for individuals who have been identified by the DUDIT as possibly having a drug problem. Finally, another group of investigators (Stuart, Moore, Kahler, Ramsey, & Strong, 2004; Stuart, Moore, Ramsey, & Kahler, 2003, 2004) also developed a 14-item brief drug abuse screening instrument that they called the DUDIT, but to the authors' knowledge there are no published reports describing this version's development and/or psychometric characteristics.

Although a variety of drug use measures currently exist, the DUDIT has several advantages over other instruments. For example, unlike the Addiction Severity Index (McLellan, Luborsky, Woody, & O'Brien, 1980) and the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST; WHO ASSIST Working Group, 2002), the DUDIT's administration time is brief (<5 mins) and it is easy to score. Also, unlike some drug screening measures that inquire about lifetime use (e.g., Cut-down Annoy Guilty Eye-opener Adapted to Include Drugs [CAGE-AID]; Brown & Rounds, 1995), the DUDIT focuses on drug use and drug-related consequences occurring within the past year, thus identifying possible diagnosable drug use problems. Another advantage is that the questions on the DUDIT are scored using continuous rather than dichotomous (e.g., yes or no) scales. Unlike dichotomous scaling (used by the DAST and CAGE-AID), continuous interval scaling has been found to reduce underreporting of drug use and related consequences (Saunders et al., 1993).

Unfortunately, psychometric evaluations of the DUDIT have been restricted to studies in Europe (three in Sweden, one in Norway, one in England) and they have been conducted mostly with severely dependent drug abusers in highly constrained settings (e.g., detoxification and inpatient units, prisons; Bakken, Landheim, & Vaglum, 2007; Bakken & Vaglum, 2007; Berman et al., 2005b, 2008; Cruce, Nordstrom, & Ojehagen, 2007; Cruce & Ojehagen, 2007; Hodgins, Alderton, Cree, Aboud, & Mak, 2007; Hodgins, Cree, Alderton, & Mak, 2008; Landheim et al., 2006). Such restrictions greatly limit the generalizability of the DUDIT. The present study was conducted to extend the evaluation of the psychometric properties of the DUDIT to substance abusers in the United States, to those with less severe drug problems, and to less restrictive settings (i.e., outpatient and residential treatment programs).

## 2. Materials and methods

### 2.1. Participants

De-identified archival data were gathered from two treatment programs in South Florida, an outpatient substance abuse treatment program and a residential substance abuse treatment program. Participants were classified into one of three groups: (a) outpatient drug abusers (ODA;  $n = 35$ ), (b) residential drug abusers (RDA;  $n = 79$ ), or (c) alcohol abusers without a drug abuse problem from either of the two treatment programs (AB;  $n = 39$ ). Group member-

ship was based on participants' scores on both the DAST and the AUDIT (e.g., to be included in the AB group, individuals must have scored <3 on the DAST-10 and  $\geq 8$  on the AUDIT). The third group was included to evaluate the discriminant validity of the DUDIT. The study was approved by the Institutional Review Board of Nova Southeastern University.

### 2.2. Measures

Participants at both treatment programs completed the DAST-10, the DUDIT, the AUDIT, and a short questionnaire gathering demographic and substance abuse history information.

#### 2.2.1. DAST-10

The DAST was selected as a comparison measure for the DUDIT because it is frequently used in the drug abuse field and has demonstrated sound psychometric properties (reviewed in Yudko, Lozhkina, & Fouts, 2007). The DAST assesses drug consequences and problem severity in the past year (Skinner, 1982). Originally a 28-item measure, 20- and 10-item versions have subsequently been created and psychometrically analyzed. The original DAST, modeled after the Michigan Alcoholism Screening Test (Selzer, 1971), has a unidimensional construct when factor analyzed (Skinner, 1982) and the 20-item version has been shown to successfully discriminate drug from alcohol abusers (Gavin, Ross, & Skinner, 1989). In a comprehensive review of studies using all versions of the DAST from 1982 to 2005, Yudko et al. (2007) concluded that the DAST has been found to have moderate to high levels of validity, sensitivity, and specificity. Since the 10-item version of the DAST (DAST-10) has comparable sensitivity and specificity to its 28- and 20-item counterparts (Rush, First, Blacker, & American Psychiatric Association Task Force for the Handbook of Psychiatric Measures, 2008), the former was used in the present study. For the DAST-10, scores range from 0 to 10, with a score of 3 or greater being suggestive of a drug problem.

#### 2.2.2. DUDIT

As the development and psychometric properties of the DUDIT have been described earlier, they will not be repeated here. Since the DUDIT is not readily available in the United States, it has been included as Appendix A to this article.

#### 2.2.3. AUDIT

The AUDIT is a widely used, psychometrically sound alcohol screening instrument that assesses harmful and hazardous drinking. This 10-item self-report measure has a total score range from 0 to 40, with a value of 8 or greater being suggestive of problematic drinking. Psychometrically, the instrument has demonstrated high internal consistency, test-retest reliability, convergent validity, sensitivity, and specificity (for a review see Reinert & Allen, 2007; Rush et al., 2008). When factor analyzed the AUDIT has yielded a two-factor solution (dependence/consequences, alcohol consumption; Maisto, Conigliaro, McNeil, Kraemer, & Kelley, 2000). As previously mentioned, the current study used the AUDIT to classify participants into the alcohol group and to evaluate the discriminant validity of the DUDIT.

### 2.3. Analyses

The following strategies were used to investigate the psychometric properties of the DUDIT: (a) convergent validity was evaluated by calculating a Pearson product-moment correlation between the DUDIT and DAST-10; (b) internal consistency reliability was assessed using Cronbach's alpha; (c) internal structure was examined using a principal component analysis (PCA); (d) predictive validity, sensitivity, specificity, and optimal cut-off scores were estimated by constructing a Receiver Operating Characteristic (ROC) curve; and

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