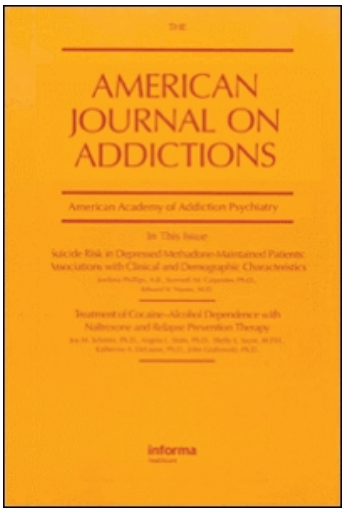

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Psychometric Evaluation of the National Opinion Research Center DSM-IV Screen for Gambling Problems (NODS)

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The present study examined the reliability, validity, and clinical utility of a brief self-report measure of gambling behavior, the National Opinion Research Center DSM-IV Screen for Gambling Problems (NODS). Participants were 157 consecutively enrolled male military veterans taking part in substance use disorder treatment. The NODS displayed good internal consistency. Concurrent and discriminant validity were demonstrated by comparing scores on the NODS to scores on the South Oaks Gambling Screen and to a measure of medical problems, respectively. Overall, the NODS appears to be a reliable, valid, and clinically useful measure of gambling problems among patients in substance use disorder treatment programs. (Am J Addict 2008;17:392–395)

Since its inclusion in the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* as a psychiatric disorder,[1] pathological gambling has been increasingly recognized as a condition with significant individual, familial, and societal costs.[2] It is estimated that between 1–2% of the United States adult population meets diagnostic criteria for pathological gambling, with an additional 3% at risk for the development of gambling problems.[3–5] In the United States, the direct and indirect costs of pathological gambling have been estimated at $32.4 to $53.8 billion for the year 2003.[6]

Although pathological gambling is currently classified as an impulse control disorder, the DSM-IV[7] diagnostic criteria for pathological gambling include tolerance, preoccupation, and withdrawal, and resemble those for substance use disorders.[8,9] Further, it is well documented that pathological gambling is likely to co-occur in individuals with substance abuse disorders.[4,10,11] Not only are individuals with gambling problems at increased risk for substance abuse disorders,[12] but rates of pathological gambling are higher among individuals seeking treatment for substance abuse than in the general population.[12–15] For these reasons, the assessment of gambling behavior should be an important aspect of substance abuse treatment.[15] However, available screening measures need further empirical validation to support their use in clinical samples.[16]

In a national gambling study commissioned by the United States Congress, Gerstein et al.[4] developed a DSM-IV based screening tool, the National Opinion Research Center Diagnostic Screen for Gambling Problems, or NODS. In community and clinical samples, the NODS has been found to be highly correlated with the South Oaks Gambling Screen (SOGS),[17] a commonly used DSM-III based screen for gambling problems,[18,19] although the NODS has consistently produced lower estimates of pathological gambling.[20] Among individuals in treatment for gambling problems, the NODS has been utilized as a measure of treatment outcome.[21] Yet psychometric evaluation of the NODS remains sparse, and there has been a call for increased psychometric evaluation to correspond with the increased use of the instrument.[18]

To our knowledge, no study has evaluated the performance of the NODS in a sample of individuals undergoing treatment for substance abuse. Therefore, the purpose of the present study was to examine the reliability, validity, and clinical utility of the NODS for assessing gambling problems among participants in a substance use disorder treatment program. We hypothesized that the NODS would display good psychometric properties and be positively correlated with a standardized and well-validated measure of gambling problems (i.e., the SOGS).

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METHODS

Participants

Participants were 157 male African-American (62.2%) and Caucasian (37.8%) military veterans (mean age = 46.5 years, *SD*= 8.21) consecutively enrolled in primary residential or day treatment for substance use disorders. Twenty-four percent of the sample reported being single, 14% were married, and 57.3% were divorced or separated. Participants reported a mean of 12.9 years (*SD* = 2.0) of education. Based on a clinical interview, all participants met criteria for substance dependence, with alcohol, cocaine, and marijuana dependence being major problems within this sample. Thirty-six percent of participants were also diagnosed with a co-occurring psychiatric condition, including psychotic disorders (14.8%), mood disorders (12.1%), post-traumatic stress disorder (6.0%), cognitive disorders (1.1%), personality disorder (0.7%), or multiple psychiatric diagnoses (2.7%).

Measures

Addiction Severity Index (ASI)

The ASI[22] is a semi-structured interview that assesses demographics as well as recent (ie, 30-day) difficulties with substance abuse and five related domains likely to be impacted by substance abuse (i.e., medical, employment/economic, legal, family/social, and psychiatric). For each of the seven domains, the ASI yields non-standardized composite scores ranging from .00 to 1.00 with higher scores indicting greater problem severity. In the current study, we utilized the medical composite subscale score of the ASI.

National Opinion Research Center DSM-IV Screen for Gambling Problems (NODS)

The NODS[4] is a 21-item measure designed to assess problematic gambling behaviors. In the present study, the lifetime version of the NODS was used. The first four questions address gambling history and serve as screening items. In the original NODS report,[4] individuals who reported ever having lost $100 or more in a day were administered the remainder of the questionnaire. These 17 items address the 10 DSM-IV diagnostic criteria for pathological gambling and are scored using a yes–no format.[7] Total scores can range from 0 to 10, with higher scores indicating more gambling problems. A score of 1 or 2 indicates at-risk gambling, and a score of 3 or 4 suggests problem gambling. Individuals who score 5 or more are labeled pathological gamblers. To accommodate the range of socioeconomic statuses of patients in our treatment program, in the current study, individuals who reported ever having gambled were administered the full questionnaire. Gerstein et al.[4] reported excellent test-retest reliability for the lifetime NODS (r=.99, p= .01). Among individuals seeking treatment for pathological gambling, the NODS has demonstrated fair to good internal consistency.[18,23] Convergent validity has been displayed by correlating scores on the NODS with scores on the SOGS, with correlations ranging from r= .71 (p< .01)[23] to r= .86 (p< .001).[18]

South Oaks Gambling Screen (SOGS)

The SOGS[17] assesses negative feelings and behaviors associated with gambling involvement. Twenty items are either answered affirmatively or negatively and yield a score of 1 or 0, respectively. Scores of 5 or more suggest probable pathological gambling. The SOGS has demonstrated adequate reliability and validity, including an excellent Cronbach's alpha (α= 0.97) and adequate test-retest correlation (r= 0.71, p< .01).[17] Convergent validity was demonstrated by comparing the SOGS scores with counselors' assessment of pathological gambling for an inpatient sample (r= 0.86, p< .01).[17]

Procedure

This study was approved by the Veterans Affairs Medical Center Research and Development Committee. As part of a routine intake assessment, all participants were administered the ASI, NODS, and SOGS within the first few days following their admission to the treatment program.

RESULTS

Gambling Behavior

Lifetime gambling was assessed using the NODS, and 88% (n= 138) of the sample reported having gambled at least once in their lives. Involvement in specific gambling activities was assessed using the SOGS, and 52.8% of the sample (n = 83) reported regular gambling (weekly or daily participation in at least one gambling activity). Using a 0–1 coding system for no involvement versus any involvement, respectively, the most common forms of gambling were playing games of skill (eg, "bowling, shooting pool, playing golf, or playing some other game of skill for money"; 22.3%, n = 35), bingo (21.0%, n= 33), betting on state lotteries (20.4%, n = 32), and playing cards for money (20.4%, n= 32).

The mean SOGS score was 2.19 (*SD* = 3.94). Based on SOGS scores, participants were divided into two problem gambling categories: no problem (86.6%) and probable pathological (13.5%). The mean NODS score was 1.50 (*SD* = 2.67). Based on NODS scores, participants were divided into four problem gambling categories: no problem (58%), at-risk (17.4%), problem (8.7%), and pathological (15.9%). Table 1 presents rates of problem gambling for the SOGS and NODS.

Internal Consistency of the SOGS and NODS

The SOGS and NODS both demonstrated good internal consistency (α= .93 and α= .88, respectively).

Concurrent Validity

In order to evaluate the concurrent validity of the NODS, we correlated raw scores on the NODS with raw scores on the SOGS. A strong positive correlation (r = .85, p < .001) was found between participants' scores on the two measures. To explore the relation between problem gambling classifications based on the NODS and SOGS, we evaluated classification

TABLE 1. Cross-Tabulation of No Problem, At-Risk, Problem, and Pathological Gamblers Based on Scores on the National Opinion Research Center DSM-IV Screen for Gambling Problems (NODS) and the South Oaks Gambling Screen (SOGS; $N = 157$)

	NODS classification			
	No problem	At-risk	Problem	Pathological
SOGS classification				
No problem	96	16	2	4
Probable pathological	3	8	10	18

concordance between the instruments. As presented in Table 1, 39 individuals scored in the "probable pathological" range on the SOGS. Based on participants NODS scores, six were identified as "problem" or "pathological" gamblers with scores of 2–3 or greater than 4, respectively, and an additional 16 were identified as "at-risk" gamblers.

Discriminant Validity

To evaluate the discriminant validity of the NODS, we computed the zero-order correlations between the participants' NODS scores and medical composite subscale scores from the ASI ($M = .46$, $SD = .34$). No significant correlation was detected ($r = .06$, $p = .49$). Following the procedure of Hodgins[21] and Wulfert,[24] we also correlated NODS scores with participants' ages. No significant correlation was detected ($r = -.02$, $p = .82$).

DISCUSSION

It is well documented that individuals with substance use disorders are at increased risk for gambling problems, relative to the general population. Therefore, the assessment of gambling problems should be an important part of substance abuse treatment.[15] In the present study, we evaluated the performance of a brief, DSM-IV-based screening measure, the NODS, for measuring gambling behavior and problems among individuals entering day or residential substance abuse treatment.

Our results are consistent with previous literature,[4,10–15] demonstrating that gambling is a common activity among patients with substance abuse disorders. Nearly nine out of ten participants reported lifetime gambling, and over half of our sample reported regular gambling (i.e., at least weekly participation in at least one gambling activity.) This level of regular gambling is notably high. Interestingly, a considerable number of male military veterans in the current sample reported participating in bingo, a form of gambling not typically associated with this population. One possible explanation for this high rate of endorsement is that bingo is offered as a recreational opportunity at the VA where participants received treatment. Unlike traditional bingo parlors, however, there is no cost associated with playing. Specifically, veterans receive several bingo cards and winners receive canteen coupons or tokens that they can redeem in the hospital store.

Finally, the possibility that a large number of participants would also experience harm from their gambling was also supported. Approximately one out of four participants scored in the "probable pathological" range on the SOGS. Although the NODS was less sensitive in detecting gambling problems, our results support the notion that the assessment of gambling problems should be an important consideration for providers of substance abuse treatment.[15]

The primary hypotheses of the study—namely, that the NODS would perform well psychometrically and demonstrate good clinical utility—were supported. The NODS demonstrated a high level of internal consistency reliability, as well as adequate levels of concurrent and discriminant validity relative to standardized and well-validated measures of problem gambling and medical problems, respectively. Although there are no pre-determined criteria for establishing convergent validity, the magnitude of correlation ($r = .85$) between the NODS and SOGS exceeded what could be considered a conservative threshold of $r = .8$ and also was consistent with previous research.[18,23] At the same time and consistent with previous research,[20] the NODS was notably more conservative than the SOGS in identifying problem or pathological gamblers. This may be an important benefit, given that the SOGS has been criticized for a high false positive rate in the general population.[25]

A growing body of evidence supports the accuracy of the DSM-IV criteria for identifying pathological gambling.[16,26,27] In this light, a major advantage of the NODS is that it was developed specifically to assess the DSM-IV criteria for pathological gambling. Given the importance of utilizing up-to-date diagnostic criteria, its use will continue to increase. As a helpful reviewer pointed out, the NODS is now mandatory for all patients entering substance abuse treatment in the state of Michigan. Of course, the NODS is not without criticism. Stinchfield, Govini, and Frisch[28] note that the at-risk and problem categories of the NODS are not supported by empirical evidence. In light of a growing body of research supporting a continuum of problem gambling,[18] future research should investigate more fully the meaning of the subclinical diagnostic categories.[29]

The present study has several strengths. First, there has been a consistent call for increased evaluation of gambling among members of ethnic minorities, and our ethnically diverse sample included both African American and Caucasian participants. Second, our sample consisted of patients with numerous psychiatric comorbidities who were undergoing day or residential treatment for substance abuse. Our results are consistent with previous literature that has reported high rates of pathological gambling among individuals with psychiatric comorbidities, and substance use disorders in particular.[13,14] There is a paucity of psychometric analysis of the NODS in the literature,[18] and we performed sound statistical analyses to evaluate relations between variables.

Several limitations to the current study must also be noted. First, our sample consisted of only male military veterans, and the generalizability of the current results is unknown. Second, each instrument was administered once only, so we were unable to evaluate the temporal stability of the measures. Third, this study considered only the relation between the NODS and the SOGS and did not include a "gold standard" structured interview to diagnose problem gambling status. As a result, it is impossible to determine the classification accuracy of the NODS, or to compare the accuracies of the NODS and SOGS. Despite these limitations, however, the NODS appears to be a reliable, valid, and clinically useful means for identifying individuals who might be experiencing difficulties related to their gambling behavior. Future research should continue to evaluate the performance of this DSM-IV based measure.

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