



Published in final edited form as:

Am J Addict. 2011 May ; 20(3): 220–227. doi:10.1111/j.1521-0391.2011.00118.x.

A Quick and Simple Screening Method for Pathological and Problem Gamblers in Addiction Programs and Practices

Rachel A. Volberg, PhD¹, Ingrid M. Munck, PhD², and Nancy M. Petry, PhD³

¹Gemini Research, Northampton, Massachusetts

²StatisticaMunck AB, Stockholm, Sweden

³University of Connecticut Health Center, Farmington, Connecticut

Abstract

Despite high rates of comorbidity among pathological gambling, substance use disorders, and other psychiatric conditions, health professionals rarely screen their clients for gambling problems. We report on the performance of the NODS-CLiP, an existing brief, three-item screen for problem and pathological gambling, and an alternative four-item screen that demonstrates improved sensitivity, good positive and negative predictive power and invariance across key demographic groups. Given high rates of comorbidity, routine and accurate identification of gambling-related problems among individuals seeking help for substance abuse and related disorders is important. The original and the alternative brief screens are likely to be useful in a range of clinical settings.

INTRODUCTION

Legal gambling has expanded rapidly in recent decades in the United States and internationally. As a consequence, difficulties related to gambling now affect a growing number of vulnerable individuals in the community. Pathological gambling is a psychiatric disorder diagnosed when one meets five or more of ten criteria. A subthreshold condition, referred to as problem gambling, is usually defined as meeting three to four of the ten pathological gambling criteria. There is a large and growing body of research showing substantial overlap between problem and pathological gambling, on the one hand, and substance use and other psychiatric disorders, on the other. Clinical and community studies have found that problem and pathological gamblers tend to have high rates of alcohol abuse and dependence, tobacco dependence, and depression as well as anxiety and impulse-control disorders.^{1–6} Despite high rates of comorbidity between problem and pathological gambling, substance use disorders and other psychiatric conditions, substance abuse and health professionals rarely screen their clients for gambling problems.

The United States Preventive Services Task Force (USPSTF) recommends routine screening for a number of psychological disorders, including drug abuse and problem drinking, depression, suicide risk, and family violence.^{7–9} There is good evidence that routine screening for these disorders improves accurate identification and lowers the burden of illness. While several short assessment tools for problem gambling have been developed, none of these screens are well-known or widely used. As a consequence, problem and

Address correspondence to Dr. Volberg, Gemini Research, PO Box 1390, Northampton, MA 01061-1390. rvolberg@geminiresearch.com..

Declaration of Interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this paper.

pathological gamblers are infrequently detected and even more rarely referred to specialist services.

Short assessment tools for problem and pathological gambling include the eight-item Early Intervention Gambling Health Test (EIGHT Screen),^{10,11} a reduced set of six items from the widely-used South Oaks Gambling Screen (SOGS),^{12,13} the Brief Biosocial Gambling Screen (BBGS), a three-item screen derived from the AUDADIS-IV,¹⁴ a two-item screen to detect gambling problems contained in the Case-finding and Help Assessment Tool (CHAT), a multi-purpose screening tool for use in primary care settings in New Zealand,^{15,16} and the two-item Lie-Bet Screen.^{17,18} While these are promising first steps, there are drawbacks associated with each of these brief screens. These drawbacks relate variously to the number of items, the domains assessed by the items, the lack of clinical validation of the underlying measure and poor performance in clinical settings.^{19–22} A gambling screen that is easy to use and score without extensive training, requires minimal administration time, and can be easily followed by more extensive assessments or by referral to specialist treatment programs is still sorely needed.

In 1998, the National Gambling Impact Study Commission contracted with the National Opinion Research Center (NORC) and partner organizations to undertake a national survey of problem and pathological gambling in the United States.²³ The research team developed a new measure to assess problem and pathological gambling based on the most recent psychiatric criteria and designed specifically for use in large population surveys (the National Opinion Research Center DSM-IV Screen for Gambling Problems or NODS). Prior to fielding the main study, a validation study with a sample of pathological gamblers in treatment found the NODS to have strong validity, good internal consistency and good test-retest reliability.²³ Studies conducted by other investigators have since found that the NODS demonstrates high internal consistency as well as good concurrent and discriminant validity.^{24,25}

Following the development of the NODS, Toce-Gerstein, Gerstein and Volberg²⁶ identified a subset of questions to which 99% of the NODS-classified pathological gamblers and 94% of the NODS-classified problem gamblers answered at least one in the affirmative. This new screen was dubbed the NODS-CLiP to remind users of the three DSM-IV criteria assessed using this screen (Loss of Control, Lying and Preoccupation). In this large study of U.S. adults, the NODS-CLiP demonstrated excellent sensitivity (96.2%) and acceptable specificity (90.2%). Toce-Gerstein et al.²⁶ did note that the performance of the NODS-CLiP in clinical settings required further study.

The purpose of the present investigation was to determine whether the NODS-CLiP performs as well in clinical settings as it did in the general population.²⁶ If so, it seems likely that this brief screening test for problem and pathological gambling will be of use to clinicians in substance abuse treatment programs and other clinical settings for the purpose of quickly and efficiently identifying individuals for further assessment of gambling-related problems.

METHODS

Study Sample

The sample for this study includes participants in a study of brief interventions for problem and pathological gambling carried out at the University of Connecticut Health Center and funded by the National Institutes of Health (Petry, Principal Investigator). Participants in the study were recruited using advertisements and screening efforts in substance abuse and medical treatment settings that served inner city populations with high rates of substance use

problems.²⁷ Potential participants were screened by telephone or in person and invited to participate in the study if they had gambled at least two days in the past two months, had wagered at least \$50 per month in the same time period and obtained a lifetime SOGS score of three or more. Exclusion criteria included acute suicidality or psychosis, low reading ability (less than 5th grade) or a desire for more intensive gambling treatment. Procedures for obtaining informed consent and ensuring the protection of human subjects were reviewed and approved by the University of Connecticut Health Center Institutional Review Board as well as by review boards at the hospitals where participants were recruited.

The total sample included 375 individuals with an average age of 42.4 years. The majority of the sample (59%) was male, 33% of the participants were African American and 15% were Hispanic. The great majority of the participants were either never married (41%) or were divorced or separated (30%). While 57% of the participants were employed either full or part-time, 19% of the participants were disabled and 15% were unemployed. One-quarter (26%) of the participants identified instant lottery tickets as their primary form of gambling; another 17% indicated that playing slot machines was their primary form of gambling and 15% said that they preferred large-jackpot lottery games. Other favorite forms of gambling included casino table games (13%), illegal numbers (10%) and betting on sports (9%).

Instruments

At the initial interview, participants completed an extensive assessment that included the lifetime and current (past 12 months) NODS as well as the lifetime and 2-month SOGS.²⁸ The SOGS has been found to be a less conservative measure of gambling-related problems than any of the DSM-IV measures developed to assess pathological gambling.^{29,30} Since eligibility for the study was based on participants' SOGS scores, it is not surprising that a proportion of the participants in the study scored below the accepted cutoff levels for problem and pathological gambling based on the NODS. For the purposes of this report, these individuals are referred to as “low-risk” gamblers if they met zero DSM-IV criteria according to the NODS (4%) (Since all of these participants were regular gamblers, we have designated all of them “low-risk” rather than identifying some as not at risk.) or “at-risk” gamblers if they met one to two NODS criteria (14%). Nevertheless, this is a high base-rate population with 61% of the sample scoring five or more on the NODS and therefore classified as lifetime pathological gamblers and an additional 22% of the sample scoring three or four on the NODS and classified as lifetime problem gamblers.

Analytic Approach

While our focus was on testing the performance of the NODS-CLiP in a clinical sample, we chose to investigate a broader range of combinations of items from the NODS rather than assume that the original NODS-CLiP was the best-performing short screen in a clinical setting. However, we made several a priori decisions that reduced the overall pool of items eligible for consideration.

Several of the DSM-IV criteria on which the NODS is based are difficult to establish with single questions. For example, two of the DSM-IV criteria (Loss of Control and Withdrawal) assume that the questioner already knows that the individual has tried to “stop, cut down or control” his or her gambling. In the NODS, information about whether someone has tried to stop gambling (Dependence Gate; NODS4) is obtained before asking whether they have felt restless or irritable during these times (Withdrawal; NODS5) and whether they have succeeded in doing so (Loss of Control; NODS6 and NODS7). Similarly, a question about whether an individual has ever lied about his or her gambling (Lying Gate; NODS11) is posed before asking whether this has occurred multiple times (Lying; NODS12). In considering items for inclusion in our short screen, we focused on the “gate”

items for Lying, Withdrawal and Loss of Control rather than on the “criterion” or scored items since using the latter would have increased the length of the screen.

A related feature of the DSM-IV is that several of the diagnostic criteria include disparate elements that are best asked as separate questions in survey administration. In the NODS, three of the DSM-IV criteria (Preoccupation, Escape and Risked Relationships) are assessed using multiple questions. Rather than include multiple items in the short screen that assess the same criterion, we selected a single item for each criterion that provided the best discrimination between respondents who scored below three on the lifetime NODS and those who scored three or more. We selected NODS1 to assess Preoccupation, NODS8 to assess Escape and NODS14 to assess Risked Relationships.

Based on these a priori decisions, items for consideration in our short screen included Preoccupation (NODS1), Tolerance (NODS3), the gate question for both Withdrawal and Loss of Control (Dependence Gate; NODS4), Escape (NODS8), Chasing (NODS10), the gate question for Lying (Lying Gate; NODS11), Illegal Acts (NODS13), Risked Relationships (NODS14) and Bailout (NODS17). Two of these items (Preoccupation and Escape) assess motivations for gambling, three of the items relate to control over gambling (or lack thereof) (Tolerance, Dependence Gate and Chasing), and four of the items are concerned with consequences arising from gambling involvement (Lying Gate, Illegal Acts, Risked Relationships and Bailout). These three dimensions are widely viewed as key elements in the problem gambling construct.^{31,32}

RESULTS

The first step in our analysis involved examination of endorsement rates for all of the individual items from the NODS to identify the items most likely to capture the largest proportion of problem and pathological gamblers in the sample. Table 1 presents information about the proportion of each lifetime NODS group that endorsed each of the lifetime NODS items.

As is evident from Table 1, no single item from the full NODS could operate alone as a brief screen for problem or pathological gambling. The highest proportion of pathological gamblers was picked up by Chasing (NODS10; 92%) which also ranked highest among problem gamblers (79%). We therefore examined all of the combinations of two and three eligible items to identify the smallest subset of items that captured the largest proportion of participants in the highest risk groups. All combinations of three items that assessed all of the dimensions of the problem gambling construct and captured 98% or more of the NODS-based pathological gamblers were then examined to determine whether 90% or more of the NODS-based problem gamblers were also identified. Finally, we examined the performance of all of the candidate combinations to assess differences in functioning based on classification accuracy and measurement invariance across gender, age and ethnicity.

Looking at the performance of numerous two-item combinations, only the combination of Escape (NODS8) and Chasing (NODS10) captured 98% or more of the pathological gamblers and 90% or more of the problem gamblers in the sample. Turning to three-item combinations, we found that seven of the 12 combinations of Preoccupation and Dependence Gate or Chasing with an item assessing consequences captured 98% or more of the pathological gamblers and 90% or more of the problem gamblers. This includes the original NODS-CLiP combination of Preoccupation, Dependence Gate and Lying Gate. Considering combinations based on the other motivational item of Escape, we found that four of the 12 combinations of this item and Dependence Gate or Chasing with an item

assessing consequences captured 98% or more of the pathological gamblers and 90% or more of the problem gamblers.

We then examined the discriminatory power of all of these combinations of three items to determine which combinations were least likely to capture participants who did not score as problem or pathological gamblers on the basis of the lifetime NODS. All of the combinations of items that included Dependence Gate (NODS4) or Lying Gate (NODS11) captured some participants who did not score as problem or pathological gamblers on the NODS. This is because these questions are “gate” items that do not count in the NODS score but are important in assessing the respective criteria. Since the original NODS-CLiP includes both of these items, this combination captures a substantial proportion of low-risk and at-risk gamblers in the clinical sample. Two alternative combinations of items that included Chasing were more effective at screening out non-problem and at-risk gamblers but still captured 98% or more of the pathological gamblers and 94% or more of the problem gamblers in our sample.

The next step in our analysis was to assess the classification accuracy of the original NODS-CLiP as well as the alternative combinations of items. In clinical settings, the challenge is to identify the best set of items that captures problem and pathological gamblers, even at the expense of including relatively large numbers of low-risk and at-risk gamblers (and thus reducing specificity). This is because there are opportunities for further assessment in clinical settings to determine the accuracy of the screen. A key performance characteristic of a clinical screen is therefore sensitivity; that is, the probability that a problem or pathological gambler will endorse one or more of the items.

Sensitivity for the two-item combination of Chasing and Escape, calculated as the number of true positives divided by the number of true positives and false negatives, was lower than for all of the three-item combinations (96.1%). As shown in Table 2, among the three-item combinations, sensitivity was highest for the combination of Chasing, Escape and Risked Relationships (CER) but was only slightly lower for the combination of Chasing, Preoccupation and Risked Relationships (CPR) and for the original NODS-CLiP.

Diagnostic efficiency is another important aspect of performance in clinical screens since it is indicative of the accuracy of the screen. Diagnostic efficiency in the present study, calculated as the sum of true positives and true negatives divided by the full sample, was highest for the combination of Chasing, Preoccupation and Risked Relationships (CPR) and was lowest for the NODS-CLiP. This is largely a consequence of using “gate” items rather than “criterion” or scored items to assess the dimensions of loss of control and consequences that make up the problem gambling construct.

Beyond classification accuracy, the utility of assessment instruments is a function of their ability to operate similarly in different demographic groups.³³ The final step in our analysis was therefore to examine the performance of the original NODS-CLiP and the alternative combinations across different demographic groups. Like the NODS-CLiP, the Chasing, Escape and Risked Relationships (CER) combination captured 100% of the pathological gamblers in the sample, regardless of gender, age or ethnicity. The Chasing, Preoccupation and Risked Relationships (CPR) combination captured all but one of the pathological gamblers in the sample.

In contrast to the most severely affected participants, the performance of the NODS-CLiP and the alternative combinations of items among problem gambling participants varied across demographic groups. In the present study, the NODS-CLiP captured 96% of the male problem gamblers but only 91% of the female problem gamblers. The NODS-CLiP captured 100% of the Hispanic problem gamblers and 94% of the Caucasian problem gamblers but

only 87% of the African American problem gamblers. Finally, while the screen captured 100% of the problem gamblers aged 18 to 29 and 97% of those aged 30 to 44, it captured only 89% of the problem gamblers aged 45 and over. The performance of the two alternative combinations of items among problem gamblers was better than the original NODS-CLiP with capture rates across all demographic groups above 90%. However, the Chasing, Escape and Risked Relationships (CER) combination performed better among female participants while the Chasing, Preoccupation and Risked Relationships (CPR) combination performed better among participants aged 18 to 29.

These differences in performance among problem gamblers from different demographic groups led us to examine one further possibility: a four-item screen that included items assessing both Preoccupation and Escape as well as Chasing and Risked Relationships (PERC). As shown in Table 2, sensitivity for this four-item combination was higher in this sample than any of the three most promising three-item combinations. Diagnostic efficiency for the four-item combination is higher than the NODS-CLiP but slightly lower than the other three-item combinations. This is largely due to the fact that the four-item combination captures a substantial proportion of at-risk gamblers. In contrast to the NODS-CLiP, the four-item combination does not capture any of the low-risk gamblers in the clinical sample and it captures all of the pathological gamblers and all but one of the problem gamblers in the sample.

Table 3 presents information about the capture rate of the original NODS-CLiP as well as the two alternative three-item combinations and the four-item combination. Table 3 also includes information about the mean lifetime SOGS score for each of the lifetime NODS risk groups.

DISCUSSION

We have reported here on the performance of a brief screen, originally developed to identify problem and pathological gamblers in population studies, in a sample of problem and pathological gamblers who received brief interventions for gambling. Our analysis shows that the NODS-CLiP does not perform as well in this clinical sample as it did in the general population.²⁶ While the NODS-CLiP captures all of the pathological gamblers and 94% of the problem gamblers in the sample, it also captures nearly half of the participants who do not endorse any of the DSM-IV criteria. An alternative combination of four items that includes Chasing instead of Dependence Gate to assess the dimension of loss of control and Risked Relationships instead of Lying Gate to assess the dimension of consequences as well as two items assessing the dimension of motivation is equally effective at capturing pathological gamblers and slightly better at capturing problem gamblers in the sample. The four-item combination also performs better in terms not capturing participants who do not score on the lifetime NODS. The improved specificity of the four-item combination also contributes to higher diagnostic efficiency of this combination of items in the clinical sample compared with the original NODS-CLiP.

In the general population, Chasing is a common subclinical behavior endorsed by many low-risk and at-risk gamblers as well as the majority of problem and pathological gamblers.³⁴ In the present study, Chasing is also a highly sensitive item endorsed by 92% of the pathological gamblers and 79% of the problem gamblers but by only 40% of at-risk gamblers and none of the low-risk participants. In contrast, both Dependence Gate and Lying Gate are endorsed by fewer pathological and problem gamblers and by more low-risk and at-risk gamblers in the clinical sample. Compared with the general population, participants in the present study—primarily low income substance abusing gamblers—are much more likely to have experienced serious consequences related to their gambling and to

spend significant time thinking about ways of getting money to gamble.³⁵ It is possible that the better performance of the Chasing item in the present study is related to the characteristics of these participants compared with problem and pathological gamblers in the general population.

With regard to measurement invariance, the original NODS-CLiP and two alternative combinations of three items perform uniformly well in relation to pathological gambling across the major demographic groups of gender, age and ethnicity. In relation to problem gambling, the NODS-CLiP captures less than 90% of African American problem gamblers and problem gamblers aged 45 and over. The three-item combinations of either Preoccupation or Escape with Chasing and Risked Relationships also perform unevenly across key demographic groups with one combination performing better with female problem gamblers and the other performing better with young adult problem gamblers. While including one additional question, the four-item combination of Preoccupation, Escape, Risked Relationships and Chasing (PERC) is the best performer overall as well as across key demographic groups.

The NODS-CLiP demonstrates good psychometric properties in this clinical sample, just as it did in the population-based samples.²⁶ The screen's sensitivity (98%) is high and positive predictive power (87%) and negative predictive power (80%) are both good. However, the NODS-CLiP captures relatively high proportions of both low-risk and at-risk gamblers. The alternative set of four items, which we have dubbed the NODS-PERC, demonstrates better psychometric properties in our clinical sample compared with the NODS-CLiP, with somewhat higher sensitivity (99.7%) and positive predictive power (88.5%) and substantially higher negative predictive power (96.3%). In situations where the base prevalence rate of problem and pathological gambling is extremely high—such as in treatment programs for substance abuse, prisons or inner city medical clinics—use of the NODS-PERC as a brief screen is preferable to the original NODS-CLiP. In situations where the base prevalence rate is low—such as in the general population—use of the original NODS-CLiP is preferable.

Limitations

There are some limitations to keep in mind in considering the results of this study. The most important consideration is that all of the participants were individuals with some level of concern about their gambling involvement. Since problem and pathological gamblers seeking treatment represent only a small proportion of individuals in the general population with moderate to severe gambling-related problems,^{35,36} it is possible that the NODS-PERC may not perform as well in samples of individuals with less severe gambling-related difficulties than those in the present study or among those with no desire for gambling-related interventions. However, the NODS-CLiP was originally developed on the basis of its performance in large, general population samples, and it therefore seems reasonable to continue to recommend its use in samples where the problem gambling prevalence rate is expected to be low.

Another limitation is that all of the participants in the study were recruited from a single state in the Northeastern United States. Although the sample is diverse, it is possible that the NODS-CLiP and the NODS-PERC may perform differently in other jurisdictions where the demographic characteristics of the population—or of problem and pathological gamblers—are very different. Further examination of the psychometric properties of both brief screens—in particular the predictive validity of the NODS-CLiP and NODS-PERC when administered alone and not in conjunction with the full battery of NODS items—is necessary.

In sum, data from this study suggest the utility of both the three-item NODS-CLiP and the four-item NODS-PERC in accurately identifying problem and pathological gamblers. The NODS-CLiP appears most useful in general population studies, while the NODS-PERC may be preferable for use with clinical and substance abuse treatment populations as well as in other populations with high rates of problem and pathological gambling. Given the dearth of effective instruments available for screening for problem and pathological gambling, the results from this study clearly point to the potential for improvement and to the need for more systematic assessments of problem gambling screening instruments to increase early identification of problem gambling in a range of settings.

Acknowledgments

This study was supported by funding from the Ontario Problem Gambling Research Centre, Ontario, Canada (Dr. Volberg); Grants P30-DA023918, R01-MH60417, R01-MH60417-Supp, R01-DA021567, and P50-DA09241 from the National Institutes of Health, Bethesda, MD (Dr. Petry); and the Patrick and Catherine Weldon Donaghue Medical Research Foundation, West Hartford, CT (Dr. Petry).

APPENDIX

The NODS-CLiP: A Three-Item Screen for Pathological and Problem Gambling

NODS1 Preoccupation	1. Have there ever been periods lasting 2 weeks or longer when you spent a lot of time thinking about your gambling experiences or planning out future gambling ventures or bets?	<input type="checkbox"/> Yes <input type="checkbox"/> No
NODS4 Dependence Gate	2. Have you ever tried to stop, cut down, or control your gambling?	<input type="checkbox"/> Yes <input type="checkbox"/> No
NODS11 Lying Gate	3. Have you ever lied to family members, friends, or others about how much you gamble or how much money you lost on gambling?	<input type="checkbox"/> Yes <input type="checkbox"/> No

If Yes to one or more questions, further assessment is advised.

The NODS-PERC: A Four-Item Screen for Pathological and Problem Gambling

NODS1 Preoccupation	1. Have there ever been periods lasting 2 weeks or longer when you spent a lot of time thinking about your gambling experiences or planning out future gambling ventures or bets?	<input type="checkbox"/> Yes <input type="checkbox"/> No
NODS8 Escape	2. Have you ever gambled as a way to escape from personal problems?	<input type="checkbox"/> Yes <input type="checkbox"/> No
NODS10 Chasing	3. Has there ever been a period when, if you lost money gambling one day, you would return another day to get even?	<input type="checkbox"/> Yes <input type="checkbox"/> No
NODS14 Risked Relationships	4. Has your gambling ever caused serious or repeated problems in your relationships with any of your family members or friends?	<input type="checkbox"/> Yes <input type="checkbox"/> No

If Yes to one or more questions, further assessment is advised.

REFERENCES

- Sellman DJ, Adamson S, Robertson P, Sullivan S, Coverdale J. Gambling in mild-moderate alcohol-dependent outpatients. *Substance Use and Misuse*. 2005; 32:199–213.
- Petry NM, Oncken C. Cigarette smoking is associated with increased severity of gambling problems in treatment-seeking gamblers. *Addiction*. 2002; 97:745–753. [PubMed: 12084144]
- Rodda S, Brown SL, Phillips JG. The relationship between anxiety, smoking and gambling in electronic gaming machine players. *J Gambl Stud*. 2004; 20:71–81. [PubMed: 14973398]
- Goodyear-Smith F, Arroll B, Kerse N, Sullivan S, Coupe N, Shephard R. Primary care patients reporting concerns about their gambling frequently have other co-occurring lifestyle and mental health issues. *BMC Fam Pract*. 2006; 7:25. [PubMed: 16606465]

5. Petry NM, Stinson FS, Grant BF. Comorbidity of DSM-IV pathological gambling and other psychiatric disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *J Clin Psychiatry*. 2005; 66:564–574. [PubMed: 15889941]
6. Kessler RC, Hwang I, LaBrie RA, et al. DSM-IV pathological gambling in the National Comorbidity Survey Replication. *Psychol Med*. 2008; 38:1351–1360. [PubMed: 18257941]
7. U. S. Preventive Services Task Force. Screening for depression: Recommendations and rationale. *Ann Intern Med*. 2002; 136:760–764. [PubMed: 12020145]
8. U. S. Preventive Services Task Force. Screening and behavioral counseling interventions in primary care to reduce alcohol misuse: Recommendation statement. *Ann Intern Med*. 2004; 140:554–556. [PubMed: 15068984]
9. U.S. Preventive Services Task Force Guide to clinical preventive services. 2nd edition. U.S. Department of Health and Human Services; Washington, DC: 1996.
10. Sullivan, S. GPs take a punt with a brief gambling screen: Development of the early intervention gambling health test (Eight Screen). In: Blaszczynski, A., editor. *Culture and the Gambling Phenomenon*. National Association of Gambling Studies; Sydney: 1999. p. 384-393.
11. Sullivan S. Don't let an opportunity go by: Validation of the EIGHT gambling screen. *International Journal of Mental Health and Addiction*. 2007; 5:381–389.
12. Strong DR, Breen RB, Lesieur HR, Lejuez CW. Using the Rasch model to evaluate the South Oaks Gambling Screen for use with nonpathological gamblers. *Addict Behav*. 2003; 28:1465–1472. [PubMed: 14512069]
13. Strong DR, Lesieur HR, Breen HB, Stinchfield R, Lejuez CW. Using the Rasch model to examine the utility of the South Oaks Gambling Screen across clinical and community samples. *Addict Behav*. 2004; 29:465–481. [PubMed: 15050667]
14. Gebauer L, LaBrie RA, Shaffer HJ. Optimizing DSM-IV-TR classification accuracy: A brief bio-social screen for detecting current gambling disorders among gamblers in the general household population. *Can J Psychiatry*. 2010; 55:82–90. [PubMed: 20181303]
15. Goodyear-Smith F, Arroll B, Sullivan S, Elley R, Docherty B, Janes R. Lifestyle screening: development of an acceptable multi-item general practice tool. *N Z Med J*. 2004; 117:1205.
16. Goodyear-Smith F, Arroll B, Coupe N. Asking for help is helpful: Validation of a brief lifestyle and mood assessment tool in primary health care. *Ann Fam Med*. 2009; 7:239–244. [PubMed: 19433841]
17. Johnson EE, Hamer R, Nora RM, Tan B, Eisenstein N, Engelhart C. The lie/bet questionnaire for screening pathological gamblers. *Psychol Rep*. 1997; 80:83–88. [PubMed: 9122356]
18. Johnson EE, Hamer RM, Nora RM. The lie/bet questionnaire for screening pathological gamblers: A follow-up study. *Psychol Rep*. 1998; 83:1219–1224. [PubMed: 10079719]
19. Ferris, J.; Wynne, H. *The Canadian Problem Gambling Index: Final report*. Canadian Centre on Substance Abuse; Ottawa: 2001.
20. Orford J, Sproston K, Erens B. SOGS and DSM-IV in the British Gambling Prevalence Survey: Reliability and factor structure. *Int Gambl Stud*. 2003; 3:53–65.
21. Grant BF, Dawson DA, Stinson FS, Chou P, Kay W, Pickering R. The Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV): Reliability of alcohol consumption, tobacco use, family history of depression and psychiatric diagnostic modules in a general population sample. *Drug Alcohol Depend*. 2003; 71:7–16. [PubMed: 12821201]
22. Rugle, L. *The treatment of problem and pathological gambling*. Report to the Office of Problem and Pathological Gambling; Sacramento, CA: 2004.
23. Gerstein, DR.; Volberg, RA.; Harwood, H.; Christiansen, EM. *Gambling impact and behavior study: Report to the National Gambling Impact Study Commission*. National Opinion Research Center at the University of Chicago; Chicago, IL: 1999.
24. Hodgins DC. Using the NORC DSM Screen for gambling problems (NODS) as an outcome measure for pathological gambling: Reliability and validity. *National Association for Gambling Studies Journal*. 2002; 14:9–17.
25. Wickwire EM, Burke RS, Brown SA, Parker JD, May RK. Psychometric evaluation of the National Opinion Research Center DSM-IV Screen for Gambling Problems (NODS). *Am J Addict*. 2008; 17:392–395. [PubMed: 18770081]

26. Toce-Gerstein M, Gerstein DR, Volberg RA. The NODS-CLiP: A rapid screen for adult pathological and problem gambling. *J Gamb Stud.* 2009; 25:541–555.
27. Petry NM, Weinstock J, Ledgerwood D, Morasco B. A randomized trial of brief interventions for problem and pathological gamblers. *J Consult Clin Psychol.* 2008; 76:318–328. [PubMed: 18377127]
28. Lesieur HR, Blume SB. The South Oaks Gambling Screen (SOGS): A new instrument for the identification of pathological gamblers. *Am J Psychiatry.* 1987; 144:1184–1188. [PubMed: 3631315]
29. Abbott MW, Volberg RA. The measurement of adult problem and pathological gambling. *Int Gambl Stud.* 2006; 6:175–200.
30. Derevensky JL, Gupta R. Prevalence estimates of adolescent gambling: A comparison of the SOGS-RA, DSM-IV-J, and the GA 20 Questions. *J Gambl Stud.* 2000; 16:227–251. [PubMed: 14634314]
31. Neal, P.; Delfabbro, PH.; O'Neil, M. Problem gambling and harm: Towards a national definition. Report to the Victoria Department of Justice. South Australian Centre for Economic Studies; Adelaide: 2005.
32. Williams, RJ.; West, BL.; Simpson, RI. Prevention of problem gambling. In: Smith, G.; Hodgins, DC.; Williams, RJ., editors. *Research and Measurement Issues in Gambling Studies.* Elsevier; London: 2007. p. 399-435.
33. Meredith W. Measurement invariance, factor analysis and factorial invariance. *Psychometrika.* 1993; 58:525–543.
34. Toce-Gerstein M, Gerstein DR, Volberg RA. A hierarchy of gambling disorders in the general population. *Addiction.* 2003; 98:1661–1672. [PubMed: 14651495]
35. Volberg, RA.; Nysse-Carris, KL.; Gerstein, DR. 2006 California problem gambling prevalence survey: Final report. Office of Problem and Pathological Gambling; Sacramento, CA: 2006.
36. Dickerson, MG. The Australian experience of the development of strategies to address gambling related problems in the community: Implications for other jurisdictions. 10th International Conference on Gambling and Risk Taking; Montreal, Canada. June 4. 1997

TABLE 1

Endorsement of Lifetime NODS Items by Study Participants

Variable Label	Lifetime Items	Total % (375)	Low-Risk (NODS=0) % (14)	At-Risk (NODS=1-2) % (52)	Problem (NODS=3-4) % (81)	Pathological (NODS=5+) % (228)
	(N)					
NODS1	Preoccupation1	64.5	---	19.2	49.4	84.2
NODS2	Preoccupation2	58.1	---	11.5	33.3	81.1
NODS3	Tolerance	52.5	---	11.5	30.9	72.8
NODS4	Dependence Gate	74.1	28.6	53.8	67.9	83.8
NODS5	Withdrawal	44.8	---	3.8	16.0	67.3
NODS6	Control Gate (Failed to Stop)	51.8	7.1	19.6	32.5	68.6
NODS7	Control (3+ times)	45.2	---	10.0	25.0	63.5
NODS8	Escape1	55.5	---	19.2	34.6	74.4
NODS9	Escape2	52.5	---	13.5	34.6	71.1
NODS10	Chasing	78.9	---	40.4	79.0	92.5
NODS11	Lying Gate	68.8	21.4	32.7	58.0	83.7
NODS12	Lying (3+ times)	59.9	---	17.3	42.0	79.7
NODS13	Illegal Acts	34.4	---	1.9	4.9	54.4
NODS14	Risked Relationships1 (Friends/Family)	29.6	---	11.5	29.6	35.7
NODS15	Risked Relationships2 (School)	8.8	---	1.9	4.9	12.3
NODS16	Risked Relationships3 (Work)	21.6	---	1.9	3.7	33.8
NODS17	Bailout	48.8	---	7.7	22.2	70.6

TABLE 2

Classification Accuracy of Different Item Combinations

Screening Test Items	Sensitivity	Specificity	Positive Predictive Power	Negative Predictive Power	Diagnostic Efficiency
CLiP: Dependence Gate + Lying Gate + Preoccupation	98.4%	30.3%	86.9%	80.0%	86.4%
CER: Chasing + Escape + Risked Relationships	99.0%	47.0%	89.7%	91.2%	89.9%
CPR: Chasing + Preoccupation + Risked Relationships	98.7%	50.0%	90.2%	89.2%	90.1%
PERC: Preoccupation + Escape + Risked Relationships + Chasing	99.7%	39.4%	88.5%	96.3%	89.1%

TABLE 3

Capture Rate of Different Item Combinations by DSM-IV Severity

	Low-Risk (NODS=0)	At-Risk (NODS=1-2)	Problem (NODS=3-4)	Pathological (NODS=5+)	Total
Total N	14	52	81	228	375
% of sample	4%	14%	22%	61%	100%
Mean SOGS score	3.2	5.3	7.4	12.3	9.9
N captured by CLIP	6	40	76	228	350
% captured by CLIP	43%	77%	94%	100%	93%
N captured by CER	0	35	78	228	341
% captured by CER	0%	67%	96%	100%	91%
N captured by CPR	0	33	78	227	338
% captured by CPR	0%	63%	96%	99%	90%
N captured by PERC	0	40	80	228	341
% captured by PERC	0%	77%	99%	100%	91%