

# A Comparative Study of Methamphetamine Abuse among Pathological Gamblers

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## Abstract

*Methamphetamine abuse is a significant problem in Asian society, but insufficient research has been done to determine levels of pathological gambling among methamphetamine abusers in the United States. This descriptive study used a survey method to determine the prevalence of pathological gambling in a population of substance abusers for a comparative analysis of methamphetamine abusers. Quantitative data from the South Oaks Gambling Scale and Massachusetts Gambling Screen instruments measured the criteria for lifetime and past year pathological gambling. A sample of 109 subjects who had been screened for a substance addiction were administered the instruments. Of these, 32 had either a primary or a secondary diagnosis of methamphetamine abuse or dependence, and 77 had other addiction diagnoses. A two-tailed t-test was used to compare mean scores of methamphetamine abusers and all other substance abusers combined. The analysis showed that a higher percentage of methamphetamine abusers met criteria for pathological gambling than non-methamphetamine abuse.*

**Keywords:** Amphetamine, stimulants, disorder, pathology, psychology, addiction, impulse, neuropsychology, neurobiology, gambling, DSM-IV-TR.

## 1. Introduction

There has been insufficient research into the comorbidity of methamphetamine abuse and pathological gambling. Many of the few gambling addiction comorbidity studies and government reports that do exist do not focus on the unique disorder of methamphetamine abuse. They fail to differentiate between types of stimulant abusers or take into account the dissimilarity of various stimulant drugs. This is problematic because the stimulant category of drugs includes a variety of distinct chemicals with their own unique characteristics. Similarly, different groups of stimulant abusers have behavioral tendencies associated with their drug of choice. Methamphetamine abusers, in particular, exhibit a number of problem behaviors and comorbidities, but there have been few studies about the relationship between methamphetamine abuse and pathological gambling.

There are substantial economic and social costs associated with methamphetamine abuse. Methamphetamine abusers criminally offend at higher levels than most substance abusing populations and access addiction treatment services in disproportionate numbers (Substance Abuse and Mental Health Services Administration 2006; National Association of Counties 2007). Methamphetamine is also chemically unique and is able to produce a quicker, longer lasting period of intoxication than many other illicit drugs, including other stimulants (Barr *et al.* 2006). The duration of the methamphetamine high from a single dose can last from 8 to 10 hours (Derlet and Heischober 1990). For many addicts, pathological gambling behaviors are more likely to occur during periods of substance intoxication. This implies that the duration of gambling behaviors may be longer for methamphetamine abusers.

A subpopulation of methamphetamine abusers who gamble may have multiple risk

factors that necessitate clinical concern because pathological gambling is associated with its own risk factors, such as criminal activity (McCorkle 2004), co-occurring psychiatric disorders (Black and Moyer 1998), and risky sexual behavior (Brown *et al.* 2005). The other variable in this co-morbid correlational inquiry, methamphetamine abuse, has reciprocal implications for those concerned with the pathological gambler. Methamphetamine use has been correlated with other risk factors including exposure to infectious diseases that are of concern to public health agencies (Mansergh *et al.* 2006) and costly medical services in the treatment of acute intoxication, substance withdrawal, and substance-induced psychiatric disorders (Rockville 2004). Increased levels of methamphetamine use nationally and the associated economic and social costs of this addiction justify an inquiry into any comorbidities that may influence treatment outcomes in this population (National Institute on Drug Abuse 2006; Nicosia *et al.* 2009).

The hypothesis was that methamphetamine abusers would have higher rates of pathological gambling than all other patients with substance use disorders in an inpatient chemical dependency treatment facility. The basis for this assumption was justified by the literature review that created a convergent analysis using a wide range of shared behavioral health markers that methamphetamine abusers experience in a unique way with pathological gamblers, including risk-taking behaviors, incarceration, poor health, mental illness, and death.

## 2. Study Objective

The purpose of this study was to test the hypothesis that methamphetamine abusers experience higher levels of pathological gambling than other substance abusers. Any research that shows that methamphetamine abusers gamble at higher levels than other substance use categories may have wide implications for the legal system and treatment providers. If the study confirms the stated hypothesis, methamphetamine abusers with a gambling disorder may represent a special

population that requires assessment and treatment inclusive of both disorders.

## 3. Materials and Methodology

The research was conducted in a state-funded, non-medical, inpatient chemical dependency treatment facility. The primary author of this paper was employed as a Program Evaluator at the facility. After completion of the study, archival data was made available for analysis and interpretation. The addiction screening process was overseen by the Agency Administrator, with the Principal Investigator acting as a supervised employee of the agency to ensure fidelity to the screening process. After completion of the study, this archival data was made available for inferential statistics and research review to undertake a more focused inquiry on methamphetamine abusers. The sample included 109 residents of an inpatient chemical dependency facility located in Spokane, Washington. Participants were between the ages of 18 and 65. A demographic trait generally shared by this population is low socio-economic status. Participants included 28 women and 81 men.

Every subject underwent a formal chemical dependency assessment in order to obtain a chemical dependency diagnosis. The diagnostic assessment used at the facility is from the State of Washington Division of Alcohol and Substance Abuse [DSHS] and is based on the American Society of Addiction Medicine [ASAM] criteria (Mee-Lee 2007; State of Washington Division of Alcohol and Substance Abuse 2007; Division of Alcohol and Substance Abuse 2008). The participants were assessed by trained staff in a standardized manner according to the State of Washington requirements within a state-licensed facility.

Two survey instruments were administered that measured pathological gambling among 109 participants. The study was conducted in 2008 over a period of 14 weeks using a convenience sample of available subjects. The two independent variables (IV) in this study include methamphetamine abuse and a second group of all other substance abuse combined. Of the 109 participants, 32 were

methamphetamine abusers. It is important to note that both primary and secondary diagnoses were obtained. To be true to the objective of the study, any person who had a primary or secondary diagnosis of methamphetamine abuse was categorized as a methamphetamine user. Of these 32, 20 had a primary diagnosis of methamphetamine abuse or dependence.

The population found in the facility is considered a roughly homogenous group of individuals in terms of economic status, age, and presenting problem. Heterogeneous factors included gender and racial background. The population could be considered layered in the sense that within it there are clusters of addiction subgroups. The sample is representative of the national adult addiction population with the exception of income. Most substance abusers have family incomes of above \$20,000 (Substance Abuse and Mental Health Services Administration 2007) but participants in the detoxification program are usually unemployed or on state assistance due to the severity of their addiction. Another consideration is that Spokane County is disproportionately Caucasian compared to Washington State overall, but racial characteristics were not tracked in this study.

## Measures

Two instruments were used to assess the gambling of this population: the South Oaks Gambling Scale (SOGS) and the Massachusetts Gambling Screen (MAGS). These instruments were chosen because they differ in emphasis. The time frames for past use inquiry differ as do the specific modalities assessed. Whereas, the SOGS assesses for lifetime gambling problems, the MAGS assesses for gambling problems within the last 30 days. The SOGS asks questions about type of gambling, amount, and frequency, whereas the MAGS emphasizes psychosocial, vocational, biological (tolerance/withdrawal) and criminal gambling-related behaviors. The SOGS and the MAGS complement each other with little redundancy.

The SOGS is probably the most widely used gambling behavior measuring instrument in the US. The theoretical assumption behind

the development of this instrument is that gambling behaviors occur along a spectrum of severity. This is particularly important when we consider that the DSM-IV-TR only provides a diagnosis for pathological gambling, but does not provide a diagnosis for subclinical gambling problems such as problem gambling (American Psychiatric Association 2000). Using DSM-IV-TR based instruments can be problematic if a treatment-seeking individual meets part, but not all, of the criteria for pathological gambling.

The SOGS was developed by Lesieur and Blume (1987) as an empirical instrument for use with general and clinical populations to assess gambling behaviors. It is based on two prior assessments, the DSM-III screening and the Gambler's Anonymous questionnaire, that had been scrutinized for overgeneralization and rigidity. The SOGS has acceptable reliability, with Cronbach's alpha measure of internal consistency of 0.81 for the general population and 0.77 for the gambling treatment population (Stinchfield 2002). Stinchfield's review also showed that the SOGS is a valid instrument with low false negative and false positive error rates. Lesieur (2006)'s literature review showed that the SOGS has acceptable inter-cultural validity and has been used internationally. This instrument has been translated into 36 languages. The SOGS consists of 20 questions and assesses for problem and pathological gambling. Five or more positive responses suggest pathological gambling.

The MAGS consists of 31 yes or no questions and assesses for problem and pathological gambling. The MAGS was developed by Shaffer *et al.* (1994) for use with adolescents, but its use has been expanded to substance-using adults. Shaffer and Freed (2002)'s study of substance using and homeless individuals showed an alpha reliability coefficient of 0.91 for the MAGS. This is particularly important to the research in this study because of similar population characteristics. There have been no additional published studies to date on use of the MAGS in adult populations.

### 4. Results

The first statistical analysis included three *t*-tests to compare the mean scores of the three dependent variables. These included the SOGS score for lifetime gambling and the two MAGS scores for meeting criteria for pathological gambling within the last 30 days. The MAGS 1 criteria measured the bio-psycho-social aspects of problem gambling and MAGS 2 measured DSM-IV-TR criteria. These scores are compared in Table 1 with that of all other substance abusers. The primary hypothesis that methamphetamine abusers would experience higher levels of pathological gambling is confirmed by all three dependent variables with no appreciable discrepancies.

Cohen's *d* (1998) levels for all three dependent variables show a moderate effect size. For SOGS, the Cohen's figure is 0.72; for MAGS 1 it is 0.60 and for MAGS 2 it is also 0.60.

Table 2 shows group statistics comparing those with a primary diagnosis of methamphetamine dependence with other substance abusers. Secondary methamphetamine abusers are removed. The standard deviation for the SOGS is high, possibly indicating the mean is a poor estimate of any particular score in the distribution for both methamphetamine and non-methamphetamine abusers.

Correlations of methamphetamine user responses on the SOGS were subjected Pearson's Correlational Coefficient. The threshold for minimal acceptability is 0.15. The correlations are strong for the majority of test items. Items 16A through 16I on the SOGS inquire about the sources gamblers use to borrow money. Some of the items bordered on significance, being a little lower than 0.15, but the majority of items show a linear and consistent relationship for methamphetamine abuser responses. The actual content of the items, along with their strength of association with methamphetamine abuse, provides preliminary information for research colleagues who wish to further explore a dual, latent trait that connects the two disorders. This type of data can provide the beginning point for second generation treatment and research hypotheses,

if researchers stay within the bounds of tests and measurement principles when theorizing about the meaning of one or two specific items.

The data confirmed the hypothesis that methamphetamine abusers would experience higher rates of pathological gambling than other groups of substance abusers. The SOGS scores showed that out of 32 methamphetamine abusers, 15 (46.9%) met criteria for pathological gambling at some point in their lifetimes versus 24.7% for non-methamphetamine abusers. The mean SOGS score for methamphetamine abusers was 5.78 and a score of 5 or above is sufficient for pathological gambling. Among clustered groups, the most frequent SOGS score for methamphetamine abusers was zero (*n*=7; 21%) and zero for non-methamphetamine abusers (*n*=41; 53%). Of those 15 methamphetamine abusers who met criteria for lifetime pathological gambling, the most common score was 7 on the SOGS (*n*=4). Of those 19 non-methamphetamine abusers who met criteria for lifetime pathological gambling, the most common score was 8 (*n*=4).

Table 1. Group statistics.

Instrument	N	Mean	SD	SE Mean
SOGS				
Meth	32	5.78	5.446	0.963
Non-meth	77	2.48	3.463	0.395
MAGS 1				
Meth	32	1.0603	2.00257	0.35401
Non-meth	77	0.0570	1.28512	0.14645
MAGS 2				
Meth	32	2.8125	3.32330	0.58748
Non-meth	77	1.1558	2.08576	0.23769

Table 2. Group statistics, primary diagnosis only.

Instrument	Mean	SD	SE. Mean
SOGS			
Meth	4.70	4.686	1.039
Non-meth	2.48	3.463	0.395
MAGS 1			
Meth	.4315	1.50771	0.33714
Non-meth	.0570	1.28512	0.14645
MAGS 2			
Meth	2.4250	2.74495	0.61481
Non-meth	1.1558	2.08576	0.23769

The MAGS instrument measured whether respondents met the criteria for pathological gambling over the last year and included two different scores each based on different questions about gambling behaviors. The first score, which has been referred to as MAGS 1 in this study, is considered a subscale and reflects the bio-psycho-social impact of gambling behaviors. On this instrument, 10 of 32 (31.25%) of methamphetamine abusers scored high enough to meet criteria for pathological gambling. Seven of 77 non-methamphetamine substance abusers (9%) met criteria for pathological gambling. There appeared to be no appreciable clustering around positive scores for either group. Sixteen of the non-methamphetamine group (20%) scored between 0 and 2 indicating problem gambling. Interestingly, this is not appreciably different percentage-wise from the methamphetamine group of 8 (25%) problem gamblers.

The second MAGS score, referred to as MAGS 2, was based on DSM-IV-TR criteria for pathological gambling. Of the methamphetamine abusers, 29.1% percent ( $n=7$ ) in this study met DSM-IV-TR criteria for

pathological gambling according to this instrument compared to 7.8% ( $n=6$ ) for the non-methamphetamine group.

When all methamphetamine abusers that met criteria for pathological gambling in any one of the three instruments or examined (even if they did not meet criteria on all the instruments), 17 (53.1%) had some history of being pathological gamblers compared to 27 out of 77 (29%) for non-methamphetamine substance abusers. Table 3 shows no appreciable discrepancies between the standard deviations for each dependent variable.

Looking at primary diagnosis only, this study showed that of all substance abusers (including methamphetamine abusers) 35 or 32% met criteria for pathological gambling. This is in line with Daghestani *et al.* (1996)'s study, which showed a level of 33%, however, that study was specific to hospitalized veterans. Although the group in the current study was not a group of veterans, there are a limited number of gambling studies specific to inpatient substance abusers and this comparison is at least helpful when considering that inpatient abusers have more problems than aggregate outpatient populations.

Table 3. Group statistics, by specific primary diagnosis.

Primary diag.	SOGS	MAG 1	MAG 2	Primary diag.	SOGS	MAG 1
	X	SD	M		X	SD
ETOH	2.65	.1255	.1255	ETOH	2.65	.1255
Methamphet.	4.70	4.646	.4315	Methamphet.	4.70	4.646
Heroin	4.44	4.546	.9131	Heroin	4.44	4.546
Cocaine	6.50	6.804	1.3600	Cocaine	6.50	6.804
Opiates	.00	-	-.6200	Opiates	.00	-
Amphet	.00	-	6200	Amphet	.00	-

## 5. Discussion

There has been a lack of research on the comorbidity of methamphetamine abuse and pathological gambling. Although stimulant abusers have been included in aggregate research about pathological gambling, very few studies about pathological gambling have been specific to methamphetamine abusers. This is a potential problem because every addiction has its own specific characteristics and associated problems. Previous research, for example, has shown that cocaine and alcohol abusers tend to

have higher levels of pathological gambling over other substance abusers, but there has been little research on this subject specific to methamphetamine abusers.

Statistically descriptive lifestyle and biological data from both disorders further encouraged the hypothesis that a statistically significant correlational relationship would be found between the methamphetamine abuse and gambling disorder variables. Sexualized behavior patterns in the gambling population are mirrored in the methamphetamine population. Due to the increased libido associated with methamphetamine abuse, these

addicts are more likely to engage in risky sexual practices and consequently develop sexually transmitted diseases. Finally, the literature review extensively outlined methamphetamine abusers have shared neurochemical properties with pathological gamblers.

The derivation of the hypothesis from triangulating shared biological, psychological, and social commonalities created a research and inquiry strategy for both behavioral health fields. The current use of a biopsychosocial paradigm of treatment across the addictions field created a reciprocal validation for ongoing dialogue using that model of problem formulation. Added to an integrated disease concept of disorder progression, the results of this study provide an evidence-based platform for further treatment advances in therapy for the dually addicted methamphetamine gambler.

## 6. Conclusions

This study lends weight to the many studies showing an appreciable comorbidity between substance abuse and pathological gambling. Of the 109 subjects, thirteen identified as having an Asian racial background. Of these, eight (61%) met criteria for problem or pathological gambling. Clearly there is a need for a co-occurring approach to the treatment of substance abuse that is inclusive of the treatment of pathological gambling. The results of this study show that methamphetamine abusers in particular may be especially vulnerable to a gambling addiction. It is logical to propose that the assessment of pathological gambling should be considered a priority for clinicians working with methamphetamine addicted populations. Without assessing for pathological gambling, addiction treatment providers run the risk of spoiling treatment effectiveness because addictive behaviors tend to be behaviorally concomitant.

Whereas state-funded substance abuse treatment is widely available in the State of Washington and most other American states, gambling disorders are generally not treated or assessed within a majority of state funded agencies. Comorbidity could partially explain

why the treatment of methamphetamine dependence is not particularly effective when compared to some other substance abuse disorder. It could also explain high recidivism rates of some chemically dependent populations that have been through drug treatment. If one addiction is treated, but not a second or third addiction, the treatment client is still an addict upon completion of a treatment program. Furthermore, because addictions tend to co-occur, experiencing one addiction is likely to cause relapse for the treated addiction. Moreover, the costs of not treating pathological gambling are high. The comorbidity of a substance abuse disorder with pathological gambling increases a number of risk factors, including suicide, incarceration, mental illness, and poor physical health.

A reasonable suggestion derived from this study is that methamphetamine abusers should be routinely assessed and treated for excessive gambling behaviors. Despite research showing high levels of gambling comorbidity across the spectrum of substance abuse diagnoses, most state-funded treatment facilities do not assess or treat pathological gambling. This is unfortunate because it may spoil the effectiveness of treatment regardless of modality. Methamphetamine abusers experience multiple psycho-social problems and comorbidities, but there are treatments available for multi-diagnostic populations, including cognitive-behavioral treatment for pathological gambling. By combining these approaches, treatment efficacy may be enhanced.

## 7. Implications for Further Research

This study is highly replicable and should be conducted on other inpatient or outpatient populations of substance abusers for confirmation of high levels of pathological gambling among methamphetamine abusers. Further confirmation could show that inpatients, in particular, are vulnerable to pathological gambling with greater severity than other populations. It would be advantageous to conduct more comparative studies, including in non-state funded facilities or among other populations, such as, mandated

patients, veterans, or youth, for example. Some potential modifiers are age, race, psychiatric comorbidity, and other demographic characteristics. Additional studies could be done from a regression analysis that identified modifying variables. Any subsequent confirmatory study on this subject strengthens the argument that dual-diagnosis assessment and treatment is warranted in clinical settings. In particular, ongoing study of this co-occurring relationship has substantial implications for type, length, intensity, and duration factors in both initial therapy and relapse prevention.

The objective of substance use disorder or pathological gambling treatment should also be considered in further research studies. The need for research is vital to basic treatment planning questions, such as whether to develop an integrated cognitive therapy found in gambling recovery programs, whether to use additional motivational interviewing strategies combined with a 12 step approach noted by many substance abuse practitioners, or whether to develop a substantially new intervention. Moreover, the effectiveness of harm reduction versus abstinence strategies has not been determined.

Further study is also needed to develop co-occurring assessment tools. For some co-occurring patients, methamphetamine dependence may be the primary diagnosis, but for others, it may be pathological gambling. As noted previously, methamphetamine addicts are usually referred for treatment by the legal system, but the majority of pathological gamblers are self-referred. One treatment consideration for comorbid patients is how much treatment should be voluntary and what level of accountability should be required for a co-occurring population. To date, there are no outcome studies that address this subject.

At the time of the literature review for this study, there was no research among the American Psychological Association journals that compared levels of alcohol abuse versus alcohol dependence in a population of comorbid pathological gamblers and methamphetamine abusers. In this study, 8 of the 32 methamphetamine abusers reported problems with alcohol use. This is slightly

lower than anticipated from the polydrug abuse frequency literature. An aggregate analysis of all the 37 pathological gamblers in the study revealed that 17 (45.9%) had a co-occurring alcohol use disorder. Rates of alcohol abuse and dependence are an understudied subject for a co-occurring pathological gamblers and methamphetamine abusers. It is known that alcoholism is common among methamphetamine abusers and (separately) pathological gamblers, but it is not known whether a triadic inter-relationship exists within a subpopulation.

Future research should also study the third variable of ethnicity and comorbid pathological gambling and methamphetamine abuse. In the United States, Asian Americans are disproportionately likely to experience gambling problems, but not necessarily substance abuse. Of all racial groups, Native Americans are likely the highest risk group for experiencing for comorbid pathological gambling and methamphetamine abuse. When weighted for proportional comparisons, Native Americans have the second highest levels of methamphetamine abuse of any racial group after Hawaiian Americans (Substance Abuse and Mental Health Services Administration 2005). Surprisingly, there are no large studies about pathological gambling prevalence inclusive of appreciable numbers of Native Americans, but the existing literature shows higher levels over other racial groups among Native American veterans (Westmeyer 2005) and alcohol dependents (Elia and Jacobs 1993). Petry (2005)'s review of the literature indicated that Native Americans have about double the prevalence of pathological gambling when compared to Caucasians.

The comorbidity of methamphetamine abuse with gambling addiction is an understudied subject. In this study, methamphetamine abusers had higher levels of pathological gambling than all other substance abusers combined. In fact, this may be the first study specific to methamphetamine abusers that examined rates of disordered gambling comorbidity. This research has advanced the knowledge about the relationship between these disorders by showing that methamphetamine abusers had higher levels of

pathological gambling than other substance abusers in the population studied. Further studies may confirm this relationship.

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