

Pilot Study of Problem Gambling in Specialized Substance Use Disorder Treatment—High Lifetime Prevalence of Problem Gambling in Opioid Maintenance Treatment Patients

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Abstract

Problem gambling is over-represented in patients treated for substance use disorders, but substance-specific prevalence of problem gambling is rarely reported. In specialized addiction treatment facilities for opioid maintenance treatment and for alcohol and prescription drug dependence, respectively, 129 patients were screened for problem gambling using the NODS-CLiP. The lifetime prevalence of problem gambling was markedly higher in opioid maintenance treatment (61 percent) than in alcohol and prescription drug dependence treatment (11 percent, $p < 0.001$). When controlling for gender and age, problem gambling remained significantly associated with opioid maintenance treatment. The present study demonstrated a very high prevalence of lifetime problem gambling in opioid maintenance treatment patients. This calls for active screening for problem gambling in substance use disorder patients, and mainly in treatment for opioid dependence.

Keywords

Substance Use Disorder, Problem Gambling, Gambling Disorder, Pathological Gambling, Comorbidity, Opioid Maintenance Treatment, Alcohol Dependence

1. Introduction

The link between disordered gambling and substance use disorders, as defined in diagnostic systems such as in the DSM-5 or preceding diagnostic manuals [1], is well established in the literature [2]-[7]. In patients diagnosed with pathological

gambling, substance use disorders have been described to represent some of the most prevalent co-morbidities; a meta-analysis reported that 21 percent and seven percent of pathological gambling patients may meet criteria of a current alcohol use disorder and drug use disorder, respectively [4]. Likewise, an increased prevalence of problem gambling has been demonstrated in samples of substance use disorder patients; a review and meta-analysis by Cowlishaw and co-workers demonstrated comorbidity with pathological gambling or the wider concept of problem gambling in 14 and 23 percent of substance users, respectively. Across types of substance use disorders and across study methodologies, in a review paper from 2014 [3], the prevalence of problem gambling ranged from less than 10 percent to around 50 percent, *i.e.* constantly well above prevalence rates reported from the general population [3]. In a more recent study from a methadone maintenance facility, as many as 46 percent of patients fulfilled criteria of past-year gambling disorder [8].

Despite an overall knowledge of an increased risk of problem gambling in patients with substance use disorders, few studies have specifically addressed differences in problem gambling prevalence across substance types. Langenbucher demonstrated a larger difference in drug dependence symptoms between problem gamblers and non-problem gamblers than for alcohol dependence symptoms between these groups [9], and it has been suggested that polydrug use may be more common in substance users with problem gambling than among non-problem gamblers in this group [10] [11]. Also, in the study by Cunningham-Williams and co-workers [12], illicit drug use, in contrast to alcohol, was a risk factor of problem gambling within a sample of substance users. In the review summarizing prevalence rates of problem gambling in substance-using populations, patients in opioid maintenance treatment (OMT) for opioid dependence tended to demonstrate somewhat higher rates of problem gambling [3], including the highest prevalence of lifetime problem gambling of 53 percent in a waiting room survey addressing a convenience sample of methadone-treated patients [13].

The relationship between problem gambling and substance use disorder calls for active screening for problematic gambling behaviours in patients treated for substance use disorders, but this issue also calls for research addressing problem gambling across specific substance use disorder groups. For these reasons, the present study aimed to address the prevalence of lifetime problem gambling in two specialized substance use disorder treatment facilities, treating alcohol and prescription drug use disorders, and opioid dependence, respectively.

2. Methods and Measures

The present study is based on self-report data on lifetime history of problem gambling in patients treated in specialized substance use disorder treatment. The study was carried out in 2015 and 2016 in specialized treatment centres for substance use disorders in the Skane region in southern Sweden. The Skane region

has a population of around 1.3 million inhabitants. This region has a regional clinical facility for inpatient and outpatient treatment of substance use disorders in the regional capital city of Malmö, and outpatient facilities mainly for opioid maintenance treatment in several other cities, including the second and third largest cities of the region, Lund and Helsingborg.

Patients were included from two types of settings in three cities, which address distinct types of substance use disorders; 1) an out-patient facility of the Malmö Addiction Centre (MAC), Sweden, treating substance use disorders related to alcohol or to the misuse of prescription drugs, typically opioid analgesics or sedatives such as benzodiazepines or similar pharmaceuticals, and 2) an out-patient department for opioid maintenance treatment (OMT) located in two units, in Lund and Helsingborg, respectively. The OMT facility, named Solstenen, constitutes a privately owned facility connected to the public insurance system. In OMT, patients who fulfil diagnostic criteria of opioid dependence receive daily maintenance treatment with methadone, buprenorphine, or buprenorphine-naloxone, according to the evidence-based principles for the treatment of opioid dependence [14]. While OMT can be used also for addictive conditions related solely to licit prescription opioid analgesics, OMT in this region traditionally has included mainly patients addicted to heroin or other illicit opioids, and typically with a high degree of severity in their clinical picture [15] [16]. In this region, the major city of the region, Malmö, offers emergency and in-patient care for substance use disorders, whereas out-patients substance use disorder treatment is offered by a number of out-patient facilities. For the groups of patients included here, they can be described as patients requiring specialized treatment for substance use disorders with typically a high degree of severity, as the milder addictive conditions would theoretically be treated or assessed in primary care.

The survey was carried out with convenience samples of non-selected patients during a specific period of time. In the alcohol and prescription drug use facility of Malmö Addiction Centre (MAC), patients were asked about participation when seen in out-patient medical assessment, and interviews were carried out by the second author. In the OMT unit of Solstenen (OMT), patients were asked about participation upon their regular visits to the facility for administration of their maintenance pharmaceutical or for other purposes within the framework of that treatment. Interviews were carried out by nursing staff. In OMT in the present setting, patients are administered daily office-based OMT in the early phases of treatment or after relapses in substance use. As the patients were approached upon their regular visits to the facility, patient with daily or very frequent attendance to the OMT can be assumed to be over-represented, possibly indicating a relatively high degree of severity in this group. The original study design was purely explorative. After inclusion of MAC patients, due to a change of location for the study in OMT patients, a tentative power calculation was made, with the objective to reach 140 OMT patients, although with considerable uncertainty and based on a considerably lower estimated prevalence of problem

gambling in opioid dependence than was actually seen in the patients included. Thus, while the final number of included OMT patients is markedly lower than in that tentative power calculations, the difference in prevalence between groups also was considerably larger than expected.

Problem gambling was measured using the NODS-CLiP [17], a three-item instrument which has demonstrated acceptable psychometric properties in the screening of problem gambling [18] [19]. Items included address the following criteria likely to indicate problematic gambling; the patient has ever experienced an episode with increased tolerance for gambling, a reported need to cut back on gambling, or a need to lie to concerned significant others about the extent of her/his gambling. Problem gambling is defined as the endorsement of one or more of the three criteria [18].

Patients were included only if they verbally agreed to the study and signed a formal written informed consent form. The study was approved by the regional ethics committee, Lund, Sweden (file number 2015/5). Given the lower prevalence of problem gambling at the MAC, statistical comparisons were made between the MAC unit as a whole and the OMT unit. Statistical calculations were carried out in SPSS software. Age across gambling status and groups of substance users was calculated using the Mann-Whitney test, and for categorical variables (gender, type of drug and gambling status), associations were made using the chi-square test. Binary logistic regressions were run in order to test associations between each predictor (age, gender, type of substance use disorder facility) and problem gambling, both for each potential predictor individually, and for all three when controlling for one another. For statistical associations, 95 percent confidence intervals were reported and *p* values below 0.05 were set to indicate a significant association.

3. Results

A total of 129 patients (68 percent male) were included, 73 patients at MAC (alcohol and prescription drug use treatment) and 56 patients in the OMT facility.

OMT patients were significantly more likely than MAC patients to be men (79 vs 60 percent, *p* = 0.03), and OMT patients were significantly younger (median age 39.5 vs 54 years, *p* < 0.01).

Sixty-one percent (*n* = 34) of OMT patients and 11 percent (*n* = 8) of MAC patients endorsed at least one item of the CLiP, indicating probable problem gambling (*p* < 0.001, **Table 1**). Problem gambling was present in 14 percent of alcohol patients, but in none of the prescription drug use patients (*p* = 0.19).

In the analysis of each potential predictor, problem gambling was significantly associated with the OMT facility, male gender and younger age (**Table 2**). When entering facility, gender and age as potential predictors of problem gambling in the same logistic regression model, OMT facility remained significantly associated with a lifetime history of problem gambling. Also, the associations between gender and problem gambling remained (**Table 3**).

Table 1. Characteristics of included study groups.

	Median age (range)	Male gender, n (%)	Lifetime problem gambling (CLiP > 0), n (%)
Alcohol and prescription drug unit (MAC)	54 (25 - 73)	44 (60)	8 (11)
- Alcohol	54 (25 - 72)	38 (67)	8 (14)
- Prescription drugs	49.5 (27 - 73)	6 (38)	0 (0)
Opioid maintenance treatment unit (OMT)	39.5 (22 - 63)	44 (79)	34 (61)

Table 2. Individual associations of problem gambling with gender, age and substance use disorder treatment facility.

Problem gambling	Male gender	Median age	Facility OMT
Yes (n = 42)	36 (86)**	40.5** (1.54 - 10.60)	34 (81)*** (0.92 - 0.97)
No (n = 87)	52 (60)	50	22 (25)

p < 0.01, *p < 0.00000001.

Table 3. Associations with problem gambling. Logistic regression including gender, age and substance use disorder treatment facility.

	OR (95% confidence interval)	p value
Male gender	3.53 (1.18 - 10.57)	0.024
Older age (per year)	0.98 (0.94 - 1.02)	0.264
Type of facility - OMT	2.06 (1.46 - 2.90)	<0.0001

4. Discussion of Findings

The present study demonstrated elevated prevalence of lifetime problem gambling in convenience samples of patients in specialized substance use disorder treatment, and with markedly higher prevalence of problem gambling in OMT, compared to clients receiving treatment of prescription drug-related or alcohol-related disorders. While no cases of problem gambling were revealed in the smaller group with a primary prescription drug use problem, prevalence rates in alcohol patients were modest compared to the OMT group, yet elevated compared to the general population.

The high prevalence of lifetime problem gambling in substance use disorder patients as a group is consistent with previous literature [2] [3] [4]. One main finding of the present paper is the large difference in problem gambling between patients receiving opioid maintenance treatment and patients receiving specialized substance use disorder treatment for prescription drugs or alcohol. This is consistent with the literature describing relatively high or very high rates of

gambling problems in OMT materials [3], although head-to-head comparisons to other substance use disorders have been rare. In a study of pathological gambling in cocaine-dependent subjects, the lifetime prevalence of the disorder was higher in subjects with both cocaine and opiate dependence (nine percent) than in subjects without opiate dependence (six percent) [20].

Likewise, in the general population, one study from the National Epidemiologic Survey on Alcohol and Related Conditions reported that pathological gambling was significantly more common in subjects using heroin and other opioids, or only other opioids, compared to drug users who did not use opioids. In the meantime, somewhat paradoxically, use of heroin only was associated with lower likelihood of pathological gambling [21]. Thus, consistent with the findings of the present paper, opioid dependence may be associated with an increased risk of problematic gambling, although the relationship between different types of opioid use may require further research. Above all, OMT is provided to patients with heroin dependence and dependence on similar illicit opioids, although potentially also for patients dependent on licit prescription opioids primarily, and it is unknown how problem gambling in these populations may depend on the type of opioid used. In the present study prescription drug users were few, and no case of problem gambling was revealed. Prescription drug misuse is known to affect large populations such as in the United States and Europe [22] [23], and there is need to further examine problem gambling in these groups of primary prescription drug users.

The prevalence of problem gambling in the present study was higher in the OMT than has been described in any other study addressing patients with opioid dependence or other substance use disorders [3]. Weinstock and co-workers assessed lifetime diagnostic pathological gambling in a convenience sample of methadone patients, where patients present in waiting rooms during screening hours were assessed, and where 53 percent fulfilled criteria of the diagnosis [13]. Across other studies summarized in the review of Cowlshaw and co-workers, prevalence rates in OMT populations were lower, although still markedly higher than in the general population, although studies differ with respect to the time frame addressed and the screening instrument used. Feigelman and co-workers [24], in a study of MMT patients, reported 10 percent lifetime problem gambling, and Peles and co-workers [25] reported lifetime problem gambling in methadone patients in 27 percent in an Israeli dataset and in 17 percent from a US facility, and Spunt [26] reported 30 percent lifetime problem gambling. Although assessing a 12-month time frame rather than a lifetime history, a Finnish study recently reported 12.5 percent problem gamblers among opioid substitution patients in Finnish clinics [27]. In contrast to the findings of the present study, Toneatto and Brennan [28] reported a different pattern of gambling prevalence among substance use disorders patients; gambling prevalence was low in both the alcohol group and in the opiate group, whereas it was markedly higher in cannabis users.

From the findings of the present study and others, there is clearly need to screen for problem gambling in patients with opioid dependence, including patients in OMT. Potentially, problem gambling in this group may also have a negative influence on the treatment outcome related to opioid dependence. Ledgerwood and Downey [29] demonstrated that in opioid substitution treatment for opioid dependence, subjects with problem gambling were more likely to drop out of treatment and more likely to use cocaine. This highlights the need to screen for problem gambling in patients in opioid substitution treatment.

The lifetime prevalence of problem gambling in the alcohol and prescription drug unit was markedly lower than in Sellman and co-workers' paper describing problem gambling in clinical out-patients with mild to moderate alcohol dependence, and where 23 percent met the criteria of current problem gambling or diagnostic pathological gambling [30]. For alcohol, a clear-cut reporting of lifetime problem gambling in alcohol patients has been rare [3]. Two studies reported problem gambling in alcohol patients specifically, although in both cases in an inpatient setting, and with an unclear time frame. These two studies revealed prevalence rates of eight percent [31] and 13 percent [32], respectively, for pathological gambling, and 29 percent [32] for problem gambling. Other studies have included mixed populations of alcohol and drug users. The study by Cunningham-Williams and co-workers demonstrated that within the sample of patients treated for substance use problems, illicit drugs were associated with problem gambling rather than alcohol, although opiate dependence specifically was not more common in the problem gambler group than among non-gamblers [12]. In a follow-up study of the opening of a new casino, Toneatto and co-workers [33] reported 14 percent problem gambling in a lifetime assessment of residential substance use disorders patients with mixed primary drugs, and where cannabis was associated with the highest rate of problem gambling. Again, in residential treatment, Wickwire and co-workers reported that in a sample of clients with mixed substance use disorders where cannabis was the most common problem drug, 25 percent were lifetime problem gamblers, although specifically in military veterans [34]. In another mixed substance use population in an older study from the Netherlands, 14.5 percent of the clients met criteria of a lifetime pathological gambling diagnosis [35]. Other high prevalence rates have been reported for problem gambling, although with an unknown time frame assessed, in mixed substance patients in a residential treatment facility in Italy, where 43 percent of the clients were reported to be problem gamblers [36].

In the present study, problem gamblers were significantly more likely to be male, and significantly younger, than non-problem gamblers. However, in logistic regression controlling for the type of substance use disorder treatment facility, the association of male gender with problem gambling remained, whereas age was no longer associated with problem gambling. The higher prevalence of problem gambling in males is consistent with previous literature from the gen-

eral population [37] [38] [39] and from clinical gambling patients [40] including in the present setting [41]. Thus, in these patients primarily diagnosed with substance use disorders, the gender distribution is expected based on problem gambling data from other populations.

Although in a pilot design and in a limited study sample, the present study has implications for treatment settings addressing substance use disorders but where pathological gambling traditionally may not be systematically addressed. Screening for gambling in substance use disorder previously has been called for [3], and may involve brief screening tools such as in the present study [3] [17], with further diagnostic assessment in case of a positive screen for problem gambling. While the present study confirms the need to screen for problem gambling in clinical populations of substance users, it further enhances the need to focus specifically on patients with opioid dependence.

The present study has limitations, mainly related to the small study samples assessed. Importantly, the groups of specific alcohol and prescription drug use treatment were small, and did not reveal any cases of problem cases in the prescription drug user group. In this sense, the present study may serve as a pilot study indicating the need for larger studies in clinical substance use disorder patients, including other substance groups than opioid dependence where problem gambling universally has been reported to be high. Also, the data available in the present study did not allow for statistical control for other co-morbid conditions, such as psychiatric disease, or misuse or actual disorders related to other substances than those included here. Also, the findings of the study are generalizable to groups of patients treated in specialized health care settings for substance use disorders, *i.e.* likely with a higher degree of severity of the substance use disorder. Thus, screening and diagnosing of problem gambling in primary care settings may require other study procedures, and may reach clients with a lower degree or more early phases of substance use problems.

5. Conclusion

In conclusion, when screening for problem gambling in patients in specialist treatment for substance use disorders, problem gambling was clearly more common than in the general population, and markedly more common in clients receiving maintenance treatment for opioid dependence. Larger clinical studies are needed in order to deepen the understanding of how problem gambling may differ across each type of substance use disorder.

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