Published in final edited form as:

Soc Psychiatry Psychiatr Epidemiol. 2014 March ; 49(3): 395–404. doi:10.1007/s00127-013-0713-z.

Severity of club drug dependence and perceived need for treatment among a sample of adult club drug users in Shanghai, China

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Abstract

Purpose—Examine the severity of club drug dependence and perceived need for treatment, and further identify their determinants among a sample of club drug users in Shanghai, China.

Methods—276 club drug users were recruited using respondent-driven sampling (RDS). Severity of dependence on club drugs was measured using the Severity of Dependence Scale (SDS).

Results—69.9% reported dependence on club drugs (i.e., SDS ≥ 4) and 36.6% reported severe dependence (i.e., SDS ≥ 6). One eighth (12.7%) perceived need for drug treatment. Severe dependence on club drugs was more likely among those who reported recent use of ecstasy and those who had more depressive symptoms, but less likely among those reporting recent use of methamphetamine. Perceived need for treatment was more likely among those who lived with a spouse or boyfriend/girlfriend, but less likely among those who had prior drug treatment experience and more severe club drug dependence.

Conclusions—Our findings suggest that educational activities should be implemented to raise public awareness about the powerful addictive properties of club drugs, along with efforts to reduce stigma towards drug abuse and psychiatric disorders. Programs to motivate drug users to seek treatment and encourage treatment linkage are urgently needed.

Keywords

club drugs; new-type drugs; methamphetamine; ecstasy; drug dependence; perceived need for treatment

Introduction

The U.S. National Institute of Drug Abuse (NIDA) defines club drugs as recreational drugs that are associated with social venues such as “raves”, clubs and dance parties. These drugs include methamphetamine, ketamine, MDMA (ecstasy), LSD, γ-hydroxybutyrate (GHB), and Rohypnol [1]. Other studies have included cocaine and marijuana as club drugs [2,3].

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Declaration of interest: This study was funded by UCLA/Fogarty AIDS International Training & Research Program D43 TW000013

There has been a growing body of literature indicating that club drug use is associated with serious health and psychiatric disorders [4–7], risky sexual behaviors, HIV infection [8–9], and violence and criminality [10–11], which burden individuals, families, and society with these problems. Moreover, heavy or dependent users are particularly at greater risk for adverse consequences [12,13]. Dependence on drugs is associated with a range of factors, including patterns of use, such as route of administration [14–16], dose [16], age at initiation of use [17], and frequency and duration of use [14,16].

Drug treatment is a means for individuals to deal with drug use and its consequences [18]. However, only a small proportion of drug users needing treatment receive it [19]. Perceiving a need for drug treatment is the first necessary step for seeking help and undergoing drug treatment [20,21]; those who perceive it are more likely to enter treatment than those who do not [21–23], and are more likely to stay in treatment and have better outcomes [24,25].

In China, club drugs are often called “new-type” drugs, a category of recreational drugs emerging in China in recent years, as distinguished from opium and heroin, including methamphetamine, ketamine, ecstasy, magu, happy water, psilocybin mushrooms, etc. [26,27]. Although use of these drugs in China is popular in the club scene, they are also widely used in private settings [27,28]. Recently, China has experienced a rapid increase in the use of club drugs, although heroin remains the most commonly used recreational drug in China [29]. Since 2003, methamphetamine has overtaken opium as the second most commonly used drug in China, ecstasy as third, and ketamine as fifth. At the end of 2010, there were 1.54 million registered drug users in China, 28% of whom used synthetic drugs (ATS, ketamine, etc.), while 6.7% of the 900,000 registered drug users at the end of 2005 had used synthetic drugs [29,30]. Among newly identified drug users in 2010, about 0.12 million (55%) had used synthetic drugs [29,30].

Now in China there are voluntary, community-based, and government-ordered drug rehabilitation centers available to drug users [31]. However, the majority of treatment admissions were for heroin use [32], and most previous research regarding drug dependence and treatment in China was focused on heroin users. Little is known about the extent and severity of club drug dependence and treatment needs among non-incarcerated and/or untreated club drug users in China, nor about the determinants. Such information will inform efforts to better address the problem of club drug use in China.

The current study had two objectives. First, we investigated the degree to which participants were dependent on club drugs and associated factors in a sample of club drug users in China who were not receiving treatment. Second, we investigated the determinants of perceived need for treatment, focusing on socio-demographic characteristics, depressive symptoms, types of drug used, frequency of club drug use, and severity of club drug dependence, based on prior literature [33–35].

Methods

Participants and procedures

Participants were recruited between May and October 2011 in Shanghai, China. Eligibility included being at least 18 years old, residing in Shanghai, not being in any formal drug treatment program within the past 30 days, and self-reported use of methamphetamine, ecstasy/MDMA, and/or ketamine once in the past three months and three or more times in the past 12 months. Biological assay methods were not used to verify drug use.

Participants were recruited using respondent-driven sampling (RDS), a modified form of “snow-balling” or chain-referral sampling that compensates participants for recruiting their

peers [36]. A total of nine “seeds” were recruited, two from personnel of a non-government organization (NGO) who personally knew them, three from social workers who know many drug users, and four by community outreach workers. We also tried to recruit seeds through other strategies such as flyers distributed and posted at universities and voluntary counseling and testing (VCT) sites, but received no response.

After the seeds completed their interviews, they were given referral coupons to distribute to their friends and acquaintances who were current club drugs users. Usually three coupons were given to each participant to recruit his/her peers, but sometimes more than three were distributed for more difficult to reach groups or when the recruitment process slowed. Sixteen participants requested additional coupons. Seeds and subsequent participants were not told the specific eligibility criteria, which helped to prevent ineligible individuals from using that information to gain entry into the study. Interested participants were asked a series of questions (such as which club drugs they had used, how they felt after taking these drugs) to help research team members make a preliminary eligibility determination, which was confirmed upon presentation at the interview office, when the questions were asked again.

This study was approved by the Institutional Review Board of the University of California, Los Angeles and the Ethics Board of Fudan University, Shanghai. All participants completed a self-administered paper-and-pencil survey either in a private room at Fudan University or in a private location of their preference. The interviews lasted 30 to 45 minutes. Participants received \$US 15 for completing a study questionnaire and \$6 per referral enrolled into the study.

Measures

Demographics—Participant demographic information was collected, including age, gender, education level, marital status, occupation, monthly individual income, and living arrangement (i.e., alone, with partner, etc).

Drug use practices—The study focused on ten club drugs: methamphetamine, ecstasy, ketamine, magu (a mixture of methamphetamine and caffeine), marijuana, cocaine, happy water (a mixture of methamphetamine, amphetamine and ketamine), cough mixture for non-medicinal use, magic mushrooms, and LSD (lysergic acid diethylamide). Frequency of use of each drug within the past three months was treated dichotomously (0=no use; 1=use). A summary variable “intensity of club drug use in past three months” was created by totaling use of all drugs in the past three months. Heroin or opiates used in the past 12 months were also assessed.

Drug use treatment history was determined by asking participants how many times they had been in a drug treatment, with responses condensed into a dichotomous variable (0=never; 1=ever).

Severity of club drug dependence was measured by the Severity of Dependence Scale (SDS) [9], which is a brief, easily administered instrument that has demonstrated validity in dependent users of ecstasy [37], cannabis [38], amphetamine and cocaine [9]. Five items were constructed to measure the subject’s own recent sense of severity of dependence, including: 1) “do you think your use (of club drugs) is out of control?”; 2) “does the prospect of missing a fix (or dose) make you anxious or worried?”; 3) “do you worry about your use (of club drugs)?”; 4) “do you wish you could stop using them?”; and 5) “how difficult is it for you to stop or go without (club drugs)?”. Each item was scored on a four-point scale (0 to 3). The overall scale was the sum of all five items, with higher scores indicating a greater degree of dependence (range: 0–15; Cronbach’s alpha=0.64). A score of three or more was used as an indication of present dependence for cocaine [39], and four or

more for amphetamines [40] and cannabis [38]. We defined a score of four or more as dependence on club drugs, and a score of 6 or more as severe dependence on club drugs.

Perceived need for drug treatment was assessed by asking participants how much they agreed with the statement that they needed to go into a drug treatment program, using a 5-point scale, with options ranging from “strongly disagree” to “strongly agree”. These options were converted into a dichotomous variable with “strongly agree” and “agree” affirming the need for treatment (1) and “neutral or unsure”, “disagree”, and “strongly disagree” denying need (0).

Depressive symptoms were measured using the short version of the Zung Self-Rating Depression Scale [41]. This 10-item instrument was adapted from the original 20-item questionnaire. Li and colleagues [42] have used this adapted version among HIV-infected persons and HIV-negative family members in China. The participants were asked how often they had 10 different feelings, including “I feel down-hearted and blue”, “I get tired for no reason”, and “I have trouble sleeping at night”. Response categories ranged from (1) “a little of the time” to (4) “most of the time”. The overall scale was the sum of the individual items (Cronbach’s $\alpha=0.68$). Some items were reverse-coded so that all scores were in the same direction, with a high score indicating more severe depressive symptoms.

Data analysis

Continuous variables, mean and standard deviations, and/or medians and ranges are reported. For categorical variables, crude population proportion and the estimated population proportion (EPP) and 95% confidence intervals (CI) generated by the RDS Analysis Tool 6.0 (RDSAT) are reported. EPP is adjusted proportions weighted by social network size and recruitment patterns [43]. If all of the RDS assumptions and requirements are met, EPP was assumed to be representative of the characteristics found in the target population [43,44].

The individualized weights generated for outcome variables (i.e., severe dependence on club drugs and perceived need for drug treatment), using RSDAT, were used to weight the data set for univariate and multivariate analyses. The individualized weights take into account the variations in participants’ network sizes and differential recruitment and homophily [44]. First, univariate logistic regression models were performed to examine factors associated with two outcome variables, respectively. Second, stepwise logistic regression models were used to identify the most significant predictors of two outcomes. Backwards elimination procedures were used, and the significance level for variable removal from the model was set at 0.15. Variables available for selection included those which were significantly ($p<0.05$) or marginally ($0.05<p<0.10$) correlated with the outcome variables in univariate analysis or based on prior knowledge of their relationship with outcome variables. A sensitivity analysis was conducted by comparing results from multivariate regression models with and without RDSAT-generated weights, and indicated that the results from the two models did not substantially differ from each other. Only the results of weighted analyses are reported here. Statistical analyses were performed using the SAS 9.2 statistical software package (SAS Institute Inc., Cary, NC).

Results

A total of nine seeds were identified, and 276 participants were recruited. Seven hundred and five recruitment coupons were distributed, and 292 (41.4%) were returned, from which 267 (91.4%) referrals were eligible and completed the survey. Twenty-five (8.6%) were not eligible and were not interviewed. Among the nine referral chains, only four (44.4%) had a length of four or more recruitment waves, and two extended to eight waves. These referral

chains with four or more waves produced 101, 83, 29 and 23 recruits, accounting for 85.5% of the total recruits. Overall, stabilization with respect to socio-demographic characteristics was obtained after five to six waves.

Demographics and depressive symptoms

Table 1 presents crude and population-adjusted estimates of demographics and depressive symptoms of the sample. Crude estimates showed that most respondents were male (72.8%), younger than 35 years (79.7%), never married (74.6%), had at least a senior high school education (66.3%), and had a monthly income of 3,000 Yuan (approximately \$US 500) or more (64.1%). With respect to occupation, 19.2% worked in enterprises, public institutions or government, and 80.8% worked in a service industry or were sole business owners or “other”. One-third (29.7%) lived with a spouse or boy/girlfriend, and 70.3% lived with other adults or alone. The average score for depressive symptoms was 22.6 (SD=4.9), with a range of 10 to 36.

Drug use practices

Table 1 presents crude and population-adjusted estimates of drug use practices of the sample. The average time elapsed since initial club drug use was about five years (SD=3.9). Crude estimates showed that in terms of recent use (within the past three months), methamphetamine (64.9%) was the most commonly used drug, followed by ecstasy (52.2%), ketamine (45.0%), marijuana (21.0%), happy water (3.6%), cough mixture (5.1%), magu (4.0%), and cocaine (2.2%). Slightly more than half of respondents (54.7%) reported using two or more club drugs in the past three months, and 30.8% reported using them 13 times or more in the past three months (i.e., no less than once per week). 5.8% of participants reported using heroin or opiates in the past 12 months. In addition, 11.2% of participants had previously been in drug treatment.

Severity of club drug dependence

Table 1 presents crude and population-adjusted estimates of club drug dependence. Crude estimates indicated that the average severity score of club drug dependence was 4.8 (SD=2.5). Only 5.4% of respondents scored 0, 24.6% scored between 1 and 3, 33.3% scored between 4 and 5, and 36.6% scored 6 or above. With a score of 4 or more being indicative of dependence, 69.9% of users were deemed as dependent on club drugs. Using a score of 6 or more as indicative of severe dependence, 36.6% of users were deemed to be severely dependent on club drugs.

Perceived need for drug treatment

Table 1 presents crude and population-adjusted estimates of perceived need for treatment and reasons for perceiving no need. Crude estimates showed that in the overall sample, 12.7% perceived a need for drug treatment. For those perceiving no need for treatment (n=241), the reasons cited included believing that he/she is not addicted to drugs (57.1%), fear of stigma if drug use is disclosed to others (29.0%), fear of being registered as a drug user with public security (24.0%), fear of public security measures (20.7%), conflict with working schedule (7.9%), and thinking that treatment is not effective (3.3%); 1.7% cited other reasons.

Factors associated with severe dependence on club drugs

To examine factors associated with severity of club drug dependence, we treated severity of club drug dependence as a binary variable for those scoring 6 or more (i.e., severe dependence on club drugs) as cases. As shown in Table 2, univariate analysis demonstrated that reporting severe dependence on club drugs was significantly negatively associated with

being married or living as married and use of methamphetamine in the past three months, and was significantly positively associated with five variables, including being male, having a monthly individual income of 3000 Yuan or more, using ecstasy in the past three months, using club drugs 13 times or more in the past three months, and more severe depressive symptoms.

In the multivariate model (Table 2), those using methamphetamine in the past three months were significantly less likely to report severe dependence on club drugs (OR=0.51; $p=0.0433$), but those using ecstasy in the past three months (OR=2.12; $p=0.0028$) and having more severe depressive symptoms (OR=1.11; $p=0.0013$) were significantly more likely to report severe dependence on club drugs. In addition, those using club drugs 13 times or more in the past three months were marginally significantly more likely to report severe dependence on club drugs (OR=1.88; $p=0.063$).

Factors associated with perceived need for drug treatment

In Table 3, univariate analysis demonstrated that perceived need for drug treatment was significantly negatively associated with being married or living as married, but was significantly positively associated with using cocaine or happy water in the past three months, using heroin or opiates in the past 12 months, having prior drug treatment, and being severely dependent on club drugs.

In the multivariate model (Table 3), persons living with a spouse or boy/girlfriend were significantly less likely than those living with other adults or alone to perceive a need for treatment (OR=0.11; $p=0.0054$). Those who had previously received drug treatment (OR=9.54; $p<.0001$) or reporting severe dependence on club drugs (OR=4.58; $p=0.0002$) were significantly more likely to perceive a need for treatment than those without a treatment history.

Discussion

Club drug use is a now worldwide problem. In this sample in China, the most frequently used recreational drug in the past three months was methamphetamine, which was consistent with published reports on patterns of club drug use in China [29,45] and other Asia countries [29,45]. However, globally and in Western countries such as the United States, where marijuana is the most commonly used recreational drug, methamphetamine, ecstasy and ketamine use were similar to our findings [46]. Similar to previous studies conducted in Western countries [47,48] and China [27], our findings showed that multiple drug use is common among club drug users.

This study was among the first to investigate the extent and severity of club drug dependence and treatment needs among non-incarcerated untreated club drug users in China. Prior literature has indicated that club drugs such as methamphetamine, ketamine, and ecstasy are highly addictive, and long-term use can lead to dependence [49,50]. We found that a high proportion of respondents indicated dependence on club drugs in our sample, suggesting that the problem of club drug use is serious in China. However, in China, club drugs emerged and became popular in recent years, but received relatively little attention in the media or research. Many people believe that club drugs are not as harmful or as addictive as heroin. Our study revealed that the most typical reason for perceiving no need for drug treatment was that users felt that they were not addicted to club drugs. Even among those deemed to be severely dependent on club drugs (i.e., SDS 6), 37% thought that they were not addicted to club drugs (data not shown).

One-eighth of respondents in our study expressed a need for treatment. Similar to estimates from other studies, even among those who were severely dependent, perceived need was infrequent [51,52]. This is unfortunate, given the high proportion of users considered to be drug-dependent. Prior literature showed that the stigma against people with drug problems causes them to be reluctant to acknowledge their problems and seek treatment [53]. In addition to thinking that they are not addicted, other reasons frequently cited for perceiving no need for treatment included fear of stigma, public security measures, and being formally registered as a drug user, since recreational drug use is illegal in China. Especially in the past, punishment and stigma for drug use were severe, involving incarceration and mandatory rehabilitation [54–56]. In the past few years, the Chinese government has taken a different approach. The Narcotics Control Law came into effect in 2008, which portrays drug users as “victims and patients” instead of “offenders”. According to the new law, drug users may be ordered to accept community drug rehabilitation treatment first; if they refuse to accept it or relapse during treatment, they may be required to accept isolated compulsory drug rehabilitation. However, they have equal rights to education, jobs, and social support of other Chinese citizens [57]. The new regulation on drug rehabilitation issued in 2011 encourages drug users to voluntarily undergo rehabilitation programs and thereby be exempt from punishment [31]. Even so, the long history of severe punishment may still have an impact on drug users and Chinese society. Extra efforts are needed to reduce stigma against drug users and motivate club drug users to seek treatment.

We observed a positive association between severity of depressive symptoms and severity of dependence, which was consistent with previous observations among users of methamphetamine, cocaine, and cannabis [58–61]. However, the cross-sectional design of our study did not allow us to establish a temporal relation, so it is unclear whether depression leads to substance use and dependence on drugs, or whether those who use drugs are more likely to have depressive symptoms or be bipolar [60]. On the other hand, given that more than half of respondents used multiple drugs, it is difficult to attribute depression to specific drugs. Future studies using a longitudinal design are needed to determine the temporal relation between dependence and depression.

Our findings demonstrated that use of methamphetamine was negatively associated with severity of dependence on club drugs, whereas the opposite was true for ecstasy, which was contrary to some of the findings of other researchers reporting that that methamphetamine leads to more dependence than ecstasy [50,62]. The reasons for this discrepancy are unclear. It is possible that severely dependent methamphetamine users might not have participated in this study, or those in early stages of use do not recognize their dependence. To better understand the differences in severity of dependence by type of club drug, studies investigating drug-specific dependence and factors affecting the severity of dependence are needed.

Consistent with previous studies [33–35], reported severity of drug dependence was found to be most strongly associated with perceiving a need for drug treatment. We found that intensity and frequency of club drug use was significantly positively correlated with perceiving a need for drug treatment in univariate analysis, but not in multivariate analysis when severity of dependence was included, in accordance with a prior study [33]. As that dependence was influenced by frequency of use and by adverse consequences associated with use, it was considered as a proxy for perceived need for treatment [63]. We noted that the frequency of use reported by our sample was quite low, but a high proportion reported dependence on club drugs. This may be due to the current illegal status of club drugs use in China, so it is possible that drug users under-reported frequency of use because they feared stigma, legal consequences, etc.; thus, dependence may be less subject to information bias.

This suggests that dependence may be a more appropriate measure of severity than frequency of use in some circumstances.

Interestingly, those living with a spouse or boy/girlfriend were less likely to perceive a need for treatment, which is consistent with the social isolation hypothesis proposed by Fiorentine and Anglin [20]; those living with a spouse or boy/girlfriend are more likely to obtain informal help from family, friends, and coworkers. Another possible explanation could be that entry into drug treatment may incur personal and social losses because of stigma, separation from family, and negative employment-related consequences. Special efforts should be made to overcome these barriers against seeking treatment.

Several limitations of this study needed to be acknowledged. First, the sample was not random, although RDS is considered by some to be one of the best methods to recruit drug users [64,65]. Second, this study had a relatively small sample size, and thus limited the ability to estimate the severity of dependence and perceived need for treatment among club drug users in China. Third, information bias was another problem. It is possible that some of the participants in our sample under-reported use of club drugs, especially frequency. Data obtained from participants were not verified objectively. During the interview, confidentiality was emphasized to avoid under-reporting. Fourth, we used SDS to measure severity of dependence on all club drugs rather than individual drugs, which limited our ability to examine the differences in dependence by type of drug. In addition, there is no standard cutoff value for SDS with respect to club drugs. The cut-off values we chose for dependence and severe dependence may be too arbitrary.

Despite these limitations, the results of this study have practical implications for policy makers and researchers. Our findings suggest that educational activities should be implemented to raise public awareness about the powerful addictive properties of club drugs, along with efforts to reduce the stigma against drug use and psychiatric disorders. Programs to motivate drug users to seek treatment and encourage treatment linkage are urgently needed. For example, outreach workers, using quick health status screening methods, could help identify drug users who perceive a need for treatment and then help link them with treatment [33,51]. In addition, more research is urgently needed to estimate the number of dependent club drug users in China and the needs for treatment, so that policy makers and researchers can develop and implement drug treatment services for club drug users in China.

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Table 1

Characteristics of study participants (n=276)

Variables	SPP		EPP	
	n	%	%	95% CI
Demographics				
Age, mean ± SD	28.6 ± 7.4			
18–24 yrs	90	32.6	35.3	28.1, 43.2
25–34 yrs	136	47.1	43.6	37.1, 50.0
35 or older	56	20.3	21.2	14.5, 28.0
Gender				
Female	75	27.2	29.6	23.0, 36.5
Male	201	72.8	70.4	63.6, 77.0
Marital status				
Married or living as married	206	74.6	72.9	66.4, 78.5
Other (single, divorced, separated)	70	25.4	27.1	21.5, 33.6
Monthly individual income (Yuan)				
<3000 (app \$US 500)	99	35.9	40.3	32.5, 47.8
3000	177	64.1	59.7	52.2, 67.5
Education level				
Junior high school or less	93	33.7	33.6	25.8, 41.6
Senior high school or more	183	66.3	66.4	58.4, 74.3
Occupation				
Enterprise, public institution, or government	53	19.2	20.4	14.8, 26.3
Sole business owner, service industry or other	223	80.8	79.6	73.8, 85.2
Domestic companion(s)				
Spouse or girl/boyfriend	82	29.7	29.8	23.0, 36.5
Other adults or alone	194	70.3	70.2	63.5, 77.0
Depressive symptoms, mean ± SD	22.6 ± 4.9			
Drug use variables				
Drug use in past three months				
Methamphetamine	179	64.9	56.7	47.5, 63.2
Ecstasy	144	52.2	54.3	46.6, 62.5
Ketamine	124	45.0	43.3	35.7, 51.0
Magu	11	4.0	2.5	1.2, 4.0
Marijuana	37	13.4	11.9	8.3, 16.2
Cocaine	6	2.2	1.9	0.4, 3.9
Cough mixture for non-medical use	14	5.1	4.3	2.1, 6.7
Happy water	10	3.6	4.7	2.0, 8.4
LSD	0	0.0	0.0	
Magic mushrooms	0	0.0	0.0	
Intensity of club drug use in the past 3 months				
<13 times	191	69.2	78.5	73.1, 83.2

Variables	SPP		EPP	
	n	%	%	95% CI
13 times	85	30.8	21.5	16.8, 26.9
Used two or more club drugs in the past 3 months	151	54.7	51.9	44.6, 59.5
Years since initial club drug use, mean $\pm$ SD	5.0 $\pm$ 3.9			
Use of heroin or opiates in the past 12 months	16	5.8	6.5	2.8, 11.1
Prior drug treatment	31	11.2	8.4	5.2, 11.6
Club drug SDS score, mean $\pm$ SD	4.8 $\pm$ 2.5			
0 (not dependent)	15	5.4	5.0	2.0, 8.4
1–3 (not dependent)	68	24.6	32.5	25.9, 38.8
4–5 (dependent)	92	33.3	27.7	22.5, 33.2
6–14 (severe dependence)	101	36.6	34.8	28.9, 41.1
Perceived need for drug treatment				
No need	241	87.3	86.2	80.9, 90.9
Need	35	12.7	13.8	9.1, 19.1
Reasons for perceiving no need for drug treatment (n=241)				
Feels that he/she is not addicted to club drugs	138	57.1	62.5	52.9, 68.3
Fear of stigma if drug use status is disclosed to others	70	29.0	25.0	18.7, 32.7
Fear of being registered as drug user with public security	58	24.0	27.1	21.1, 38.1
Fear of public security measures	50	20.7	16.2	12.2, 22.6
Conflict with working schedule	19	7.9	5.2	2.2, 6.9
Belief that treatment is not effective	8	3.3	2.3	0.7, 4.3
Other (e.g., losing personal freedom)	4	1.7	0.6	0.2, 1.7

CI, confidence interval; SD, standard deviation

Table 2
Univariate and multivariate logistic regression models predicting severe dependence on club drugs (SDS 6)

Independent variables	COR (95% CI)	p-value	AOR (95% CI)	p-value
Age (years)	1.00 (0.97–1.04)	0.8057		
Gender (male)	2.50 (1.36–4.58)	0.0030		
Marital status (married or living as married)	0.58 (0.34–0.99)	0.0474	0.61 (0.35–1.09)	0.0936
Monthly individual income (3000 Yuan)	1.77 (1.05–2.99)	0.0331		
Education (senior high school or higher)	1.32 (0.78–2.23)	0.3010		
Occupation (enterprise, institution or government)	0.80 (0.42–1.49)	0.4783		
Living with spouse or boy/girlfriend	0.67 (0.38–1.17)	0.1547		
Drug use in past three months				
Methamphetamine	0.42 (0.25–0.69)	0.0007	0.51 (0.27–0.98)	0.0433
Ecstasy	3.08 (1.82–5.19)	<.0001	2.12 (1.09–4.16)	0.0280
Ketamine	1.29 (0.78–2.12)	0.3143		
Magu	0.51 (0.08–3.09)	0.4640		
Marijuana	0.84 (0.39–1.81)	0.6617		
Cocaine	7.04 (0.87–57.00)	0.0674		
Cough mixture	1.13 (0.33–3.86)	0.8499		
Happy water	2.66 (0.90–7.85)	0.0763		
Years since initial club drug use	0.99 (0.93–1.05)	0.7321		
Intensity of club drug use in past 3 months (13 times)	2.57 (1.45–4.57)	0.0013	1.88 (0.97–3.67)	0.0630
Used two or more club drugs in past 3 months	1.54 (0.94–2.54)	0.0888		
Used heroin or opiates in past 12 months	0.76 (0.27–2.17)	0.6084		
Had prior drug treatment	1.54 (0.65–3.64)	0.3273		
Depressive symptoms	1.09 (1.03–1.15)	0.0020	1.11 (1.04–1.18)	0.0013

Table 3
Univariate and multivariate logistic regression models predicting perceived need for treatment

Independent variables	COR (95% CI)	p-value	AOR (95% CI)	p-value
Age (years)	1.02 (0.98–1.07)	0.3267		
Gender (male)	1.97 (0.82–4.72)	0.1280		
Marital status (married or living as married)	0.41 (0.18–0.95)	0.0386		
Monthly individual income (3000 Yuan)	0.92 (0.46–1.86)	0.8196		
Education (senior high school or higher)	1.27 (0.60–2.67)	0.5280		
Occupation (enterprise, institution, or government)	1.54 (0.70–3.41)	0.2843		
Living with spouse or boy/girlfriend	0.10 (0.02–0.45)	0.0026	0.11 (0.03–0.53)	0.0054
Drug use in past three months				
Methamphetamine	0.91 (0.45–1.84)	0.7942		
Ecstasy	0.98 (0.49–1.95)	0.9548		
Ketamine	1.09 (0.54–2.17)	0.8170		
Magu	0.24 (0.01–12.09)	0.4724		
Cocaine	6.97 (1.19–40.91)	0.0315		
Marijuana	1.28 (0.48–3.41)	0.6270		
Cough mixture	0.14 (0.00–7.12)	0.3297		
Happy water	4.24 (1.35–13.37)	0.0136		
Years since initial club drug use	1.04 (0.96–1.12)	0.3207		
Intensity of club drug use in past 3 months (13 times)	1.90 (0.90–4.03)	0.0903		
Used two or more club drugs in past 3 months	1.17 (0.59–2.34)	0.6578		
Used heroin or opiates in past 12 months	4.33 (1.52–12.28)	0.0059		
Had prior drug treatment	9.39 (3.72–23.70)	<.0001	9.54 (3.37–27.03)	<.0001
Depressive symptoms	1.02 (0.95–1.10)	0.5203		
Severe dependence on club drugs (SDS 6)	4.35 (2.10–8.99)	<.0001	4.58 (2.06–10.22)	0.0002